



REPORT

Noise Impact Study

*Schedule "B" Municipal Class Environmental Assessment
Albion Vaughan Road and King Street, Town of Caledon, Ontario*

Submitted to:

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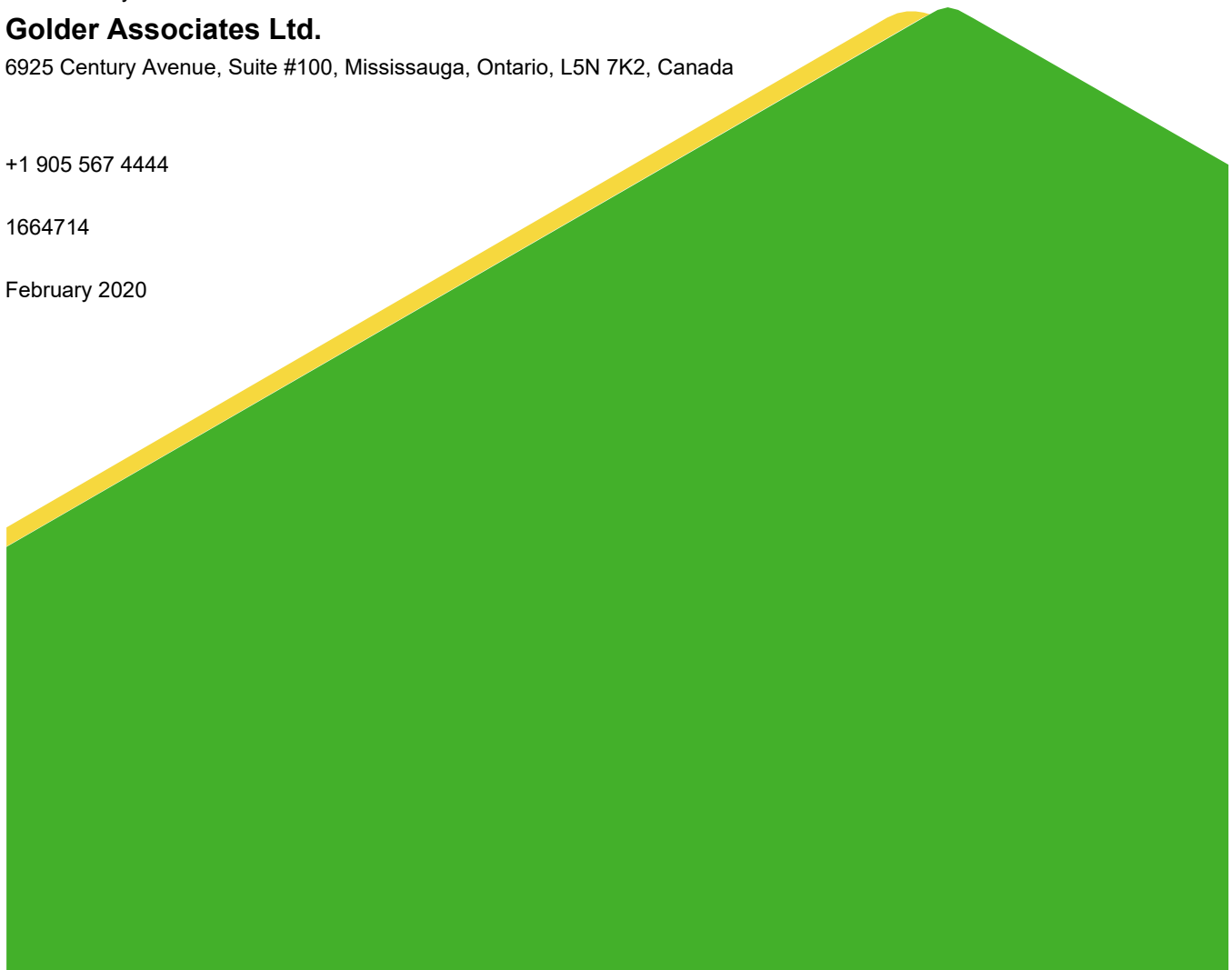
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IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

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Basis and Use of the Report:

This report was prepared for the exclusive use of CIMA+ (the Client) and, once finalised, are intended to fulfil the Regional Municipality of Peel (Region of Peel) requirements in support of the environmental assessment. The report is based on review of the project design (the Project), discussions with the Client, review of documentation provided by Client and calculations made to identify potential noise impacts due to the Project. The reports cannot account for changes to the Project after it has been finalised and submitted by Client to the Region of Peel. The information, recommendations and opinions expressed in this report are for the sole benefit of the Client and the applicable regulatory authorities that are authorized to rely on the report as Authorized Users, subject to the limitations and purposes described herein. No other party may use or rely on this report or any portion thereof without Golder's express written consent. Any other use of this report by others is prohibited and is without responsibility to Golder. The report, all plans, data, drawings and other documents as well as all electronic media prepared by Golder are considered its professional work product and shall remain the copyright property of Golder, who authorizes only the Client and Approved Users to make copies of the report, but only in such quantities as are reasonably necessary for the use of the report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make available the report or any portion thereof to any other party without the express written permission of Golder. The Client acknowledges that electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore the Client and any Authorized Users can not rely upon the electronic media versions of Golder's report or other work products unless it was directly provided by Golder.

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While ensuring that the report was prepared in general conformance with regulatory and guideline requirements, Golder cannot guarantee that the Region of Peel will approve the environmental assessment once the final report has been submitted.

Physical sampling of atmospheric emission sources was not completed as part of the scope of work.

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by CIMA+ (CIMA) on behalf of the Regional Municipality of Peel (Region of Peel) to complete a Noise Impact Study (NIS) as supporting documentation for the Municipal Class Environmental Assessment (EA) for the proposed roadway improvements to Albion Vaughan Road and King Street, Town of Caledon (the Project). As part of this EA, this NIS has been prepared to assess the potential noise impact of the Project.

The NIS provides a summary of the noise impact assessment for the Project on the identified neighbouring sensitive receptors. In addition, the NIS also identifies the applicable municipal noise by-law, describes a noise complaint process for construction activities, and provides a general discussion regarding noise arising from construction activities.

2.0 PROJECT DESCRIPTION

The proposed Project is located at the intersection of Albion Vaughan Road and King Street East (Project Site). Note that Albion Vaughan Road is renamed as Caledon King Townline South just south of the intersection (at Albion Vaughan Road and Old King Road). Additionally, King Street East is renamed as King Road immediately east of the intersection. However, in the interest of consistency when referring to this study area, the names 'Albion Vaughan Road' and 'King Street East' will be used herein. The Project Site is shown in Figure 1.

The Project Site extends approximately 190 m to the north, 230 m east, 200 m south, and 165 m west from the intersection of Albion Vaughan Road and King Street East. The Project involves proposed roadway improvements that include the widening of Albion Vaughan Road and King Street East to create additional turning lanes in all directions. The proposed roadway improvements will involve measures to increase the overall capacity of the road system in anticipation of population growth within the adjacent areas.

2.1 Existing Conditions

The Project Site is situated in a rural residential setting and is currently a two lane road with one lane in each direction. Residential housing and natural areas (Nashville Conservation Reserve) represent the prominent land use areas adjacent to the Project Site.

The posted speed limit is 60 km/hr and the 2017 Annual Average Daily Traffic (AADT) count for Albion Vaughan Road is 8,294 northbound and 4,908 southbound and for King Street East is 6,194 eastbound and 8,080 westbound, within the Project Site.

2.2 Proposed Future Conditions

For the purposes of the NIS, it is understood the future proposed condition (i.e., 10 years after completion of construction or ultimate traffic) is for the year 2037 and includes the widening of Albion Vaughan Road and King Street East. The posted speed limit will remain at 60 km/hr and the 2037 AADT for Albion Vaughan Road will be 10,209 northbound and 6,398 southbound and for King Street East it will be 7,614 eastbound and 11,544 westbound within the Project Site. It is Golder's understanding that the future traffic volumes are established on future population growth and not the roadway design itself. For the purposes of the NIS, only existing sensitive land uses in the vicinity of the Project Site were evaluated.

It is expected all future applications to the Region of Peel for future development projects for sensitive land uses will be supported with appropriate noise assessments, which would consider the future design of the Project Site.

3.0 DESCRIPTION OF TECHNICAL TERMS

To help understand the analysis and recommendations made in this report, the following is a brief discussion of technical noise terms.

Sound pressure level is expressed on a logarithmic scale in units of decibels (dB). Since the scale is logarithmic, a sound that is twice the sound pressure level as another will be three decibels (3 dB) higher.

The noise data and analysis in this report have been given in terms of frequency distribution. The levels are grouped into octave bands. Typically, the centre frequencies for each octave band are 31.5, 63, 125, 250, 500, 1000, 2000, 4000 and 8000 Hertz (Hz). The human ear responds to the pressure variations in the atmosphere that reach the ear drum. These pressure variations are composed of different frequencies that give each sound we hear its unique character.

It is common practice to sum sound levels over the entire audible spectrum (i.e., 20 Hz to 20 kHz) to give an overall sound level. However, to approximate the hearing response of humans, each octave band measured has a weighting applied to it. The resulting “A-weighted” sound level is often used as a criterion to indicate a maximum allowable sound level. In general, low frequencies are weighted higher, as human hearing is less sensitive to low frequency sound.

Environmental noise levels vary over time, and are described using an overall sound level as the Leq, or energy averaged sound level. The Leq is the equivalent continuous sound level, which in a stated time, and at a stated location, has the same energy as the time varying noise level. It is common practice to measure Leq sound levels in order to obtain a representative average sound level.

4.0 RELEVANT GUIDELINES AND POLICIES

The following guidance documents and policies can be applicable for providing criteria and additional guidance for the assessment of noise from road traffic for this Project. These documents and their relevance to the NIS are summarized in Table 1 below, followed by a cursory review of each document. These documents are provided in Appendix A.

Table 1: Applicable Noise Criteria

Governing Body	Guidance Document	Intended Use	Location of Assessment	Criterion to consider mitigation ¹
Region of Peel	Corporate Policy No. W30-04 Noise Attenuation Barriers Policy	Retrofit or Local Improvement Process	Existing reverse frontage (rear or side lot abutting a Regional	>60 dBA Daytime traffic only (i.e., 7:00 to 23:00, 16 hrs) ²

Governing Body	Guidance Document	Intended Use	Location of Assessment	Criterion to consider mitigation ¹
	(June 1996, June 2011 Review, August 2015 Review)		road) residences (i.e., Outdoor Living Area)	
Region of Peel	Corporate Policy No. W30-04 Private Noise Attenuation Walls Conversion Policy (October 2016) ³	Replaced the Local Improvement Process	Existing reverse frontage (rear or side lot abutting a Regional road) residences (i.e., Outdoor Living Area)	>60 dBA Daytime traffic only (i.e., 7:00 to 23:00, 16 hrs) ²
Region of Peel	General Guidelines for the Preparation of Acoustical Reports in the Region of Peel (November 2012)	New Residential Developments	Outdoor Living Area (OLA)	>55 dBA Daytime traffic only (i.e., 7:00 to 23:00, 16 hrs) ²

Notes:

¹ Calculated noise levels based on projected future traffic counts (i.e., 10 years into the future, or ultimate traffic count where appropriate).

² Values represent average levels established over the given period.

³ It is understood this is the latest addendum to Region of Peel Corporate Policy No. W30-04.

Other guidance documents referenced, as required, are from the Ministry of Transportation (MTO) and Ontario Ministry of Environment, Conservation and Parks (MECP) and are further discussed below as well.

4.1 Region of Peel - Noise Attenuation Barriers Policy, Private Noise Attenuation Walls Conversion Policy and General Guidelines for the Preparation of Acoustical Reports in the Region of Peel

The Region of Peel's *Corporate Policy W30-04 Noise Attenuation Barriers* document dated June 13, 1996 (Region of Peel's Noise Barrier Policy) is intended for local improvement or barrier retrofit. The Project is a capital works project and it is Golder's understanding that the Region of Peel applies this policy to capital works projects. The Region of Peel's Noise Barrier Policy states that only existing residential sites with reversed frontage and experiencing a daytime noise level equivalent (L_{eq} 16 hours from 7:00 a.m. to 11:00 p.m.) of 60 dBA or greater shall be considered for retrofit noise attenuation barriers. In June 2011 and August 2015, the Region of Peel carried out additional reviews of the Region of Peel Noise Barrier Policy, specifically the Local Improvement process and on September 10, 2015, under Resolution 2015-663, Regional Council endorsed a program to rebuild and

relocate private noise attenuation walls located on private property that are adjacent to Regional roads onto the property line bounding the Regional Road and funded in full by the Region of Peel which is also known as the Private Noise Attenuation Walls Conversion Policy. The policy applies to private noise attenuation walls in existence as of September 10, 2015 and is estimated to take 30 years to complete. It Golder's understanding the Private Noise Attenuation Walls Conversion Policy is the latest addendum to Region of Peel Corporate Policy No. W30-04 and supersedes certain aspects of the Region of Peel's Noise Barrier Policy. Aspects of the Region of Peel's Noise Barrier Policy latest include;

- 1) Noise walls constructed as a condition of development shall be constructed with the centreline a minimum of 300 mm on the private side of the street line and become the maintenance responsibility of the homeowner through appropriate clauses registered on the title of the lot.
- 2) For the Region to participate in the installation of the noise attenuation barriers, a minimum anticipated noise attenuation of 5 dBA must be achieved.
- 3) A petition must be signed by owners representing a minimum of 2/3 of the properties in the benefitting area representing a minimum of 50% of the assessed value in order to be considered for a retrofit noise wall under the *Local Improvement Act*.
- 4) Noise attenuation walls will be relocated and constructed on the property line abutting Regional property only where rear yards or side yards abut a municipal road
- 5) The cost of converting the private attenuation walls including design, construction, and maintenance will be funded in full, 100%, by the Region of Peel
- 6) In situations where there is a capital works project planned to widen a Regional Road and construct Regional noise attenuation walls, any affected private noise attenuation walls will be removed as part of the capital works regardless of the condition of the walls.

The Region of Peel *General Guidelines for the Preparation of Acoustical Reports* dated November 2012 (Region of Peel's Acoustical Report Guideline) is understood to be intended for new residential developments and therefore was only referenced for supporting information such as the location of receivers and typical noise wall heights.

4.2 MTO's Environmental Guide for Noise

The MTO's Environmental Guide for Noise (MTO Noise Guide) provides requirements for noise assessments and mitigation relating to the construction of new or the expansion of existing Provincial Highways. The MTO Noise Guide updates, improves, and supersedes the MOE/MTO Noise Protocol and the *MTO Quality and Standards Directive A-1 - Noise Policy and Acoustical Standards for Provincial Highways*. The requirements for noise assessments have been summarized into the following two Environmental Protection Requirement(s) (EPR(s)) for noise according to the *MTO Environmental Protection Requirements Section 6*:

NOISE-1 *During design of a new or modified highway, a noise assessment by a qualified acoustical specialist is required for the Most Exposed Side and the OLAs of Noise Sensitive Areas. As an initial screening, future sound levels shall be assessed with and without the proposed improvements for the Most Exposed Side. The objective for outdoor sound levels is to achieve the future predicted ambient that would occur without the proposed highway. The significance of a noise impact will be quantified by using this objective in addition to the change in sound level above the ambient (i.e., the future*

sound level without the proposed improvements is compared to the future sound level with the proposed improvement).

The determination of the provision of mitigation is based on the analysis of the predicted noise level at the OLAs.

Table 2 below, which is a copy of Table 2.1 of the MTO Noise Guide, summarizes the criteria for the requirement of noise mitigation efforts:

Table 2: MTO Noise Guide - Mitigation Effort Required for the Projected Noise Level with the Proposed Improvements

Change in Noise Level Above Ambient / Projected Noise Levels with Proposed Improvements	Mitigation Effort Required
<ul style="list-style-type: none"> ■ <5 dBA change & <65 dBA 	<ul style="list-style-type: none"> ■ None
<ul style="list-style-type: none"> ■ ≥ 5 dBA change OR ■ ≥ 65 dBA 	<ul style="list-style-type: none"> ■ Investigate noise control measures on right-of-way. ■ Introduce noise control measures within right-of-way and mitigate to ambient if technically, economically and administratively feasible. ■ Noise control measures, where introduced, should achieve a minimum of 5 dBA attenuation, over first row receivers.

NOISE-2 *Highway construction shall be undertaken in a manner to minimize noise levels and identify a process for dealing with public complaints during construction. Pile driving and blasting operations shall be in accordance with Ontario Provincial Standard Specifications (OPSS 120) and Ministry of the Environment Publication NPC-119.*

As described in the MTO Noise Guide, a noise analysis is carried out as follows during the Transportation Planning stage to meet EPR Noise-1:

- identification of the area of investigation;
- identification of noise sensitive areas;
- determination of future ambient noise levels (i.e., without the Project);
- determination of future noise levels with the undertaking (i.e., with the Project);
- determination of potential impact;
- determination of significance;
- assessment of mitigation; and
- summarize the noise analysis in a noise report.

5.0 METHODOLOGY

The following methodology was carried out to assess the potential noise impacts due to the Project proposed roadway improvements;

- identification of the Area of Investigation;
- identification of Noise Sensitive Areas (NSAs);
- determination of existing ambient noise levels without the Project;
- determination of future ambient noise levels (i.e., without the Project);
- determination of future noise levels with the undertaking (i.e., with the Project);
- determination of potential impact;
- determination of significance; and
- assessment of mitigation.

In addition, a qualitative assessment of the construction phase was completed, identifying the applicable municipal noise by-law, describing a noise complaint process for construction activities, and provide a general discussion regarding noise arising from construction activities.

5.1 Area of Investigation

The Area of Investigation defines an area surrounding the Project where potential noise effects are assessed at sensitive receptor locations. For the NIS, sensitive receptors up to 600 m from the edge of the Project Site were identified. Figure 1 illustrates the Area of Investigation.

5.2 Noise Sensitive Areas

In assessing potential noise effects, Noise Sensitive Areas (NSAs) and respective OLAs (i.e., receiver locations) were identified within the Area of Investigation and in accordance with the MTO Noise Guide and/or Region of Peel's guidance documents as further described below.

The MTO Noise Guide defines NSA(s) as one of the following land uses, with an 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 OLAs for use by all occupants; and
- hospitals, nursing homes for the aged, where there are OLAs for the patients.

Where a new freeway/highway corridor or route is planned, the following land uses would qualify as NSAs, provided they have OLAs, in addition to the land uses noted above;

- education facilities and day care centres;
- campgrounds that provide overnight accommodation; and
- Hotels/motels with OLAs (i.e. swimming pool area, etc.) for visitors.

Land uses by themselves that do not qualify as NSAs include the following:

- apartment balconies above ground floor;
- churches;
- cemeteries;
- parks and picnic areas which are not inherently part of a NSA;
- all commercial; and
- all industrial.

The MTO Noise Guide defines the receiver location at 1.2 m above ground, at a distance of 3 m away from the dwelling unit at the most exposed side. A receiver height of 1.5 m was conservatively considered in accordance with MECP and Region of Peel requirements.

The Region of Peel's Noise Barrier Policy and Private Noise Attenuation Walls Conversion Policy focuses on existing residences. The Region of Peel's Acoustical Report Guideline identifies the height of a receiver location to be 1.5 m above the ground at a point located 3.0 m from the real wall of the dwelling unit. This guideline is not explicit which side of the dwelling unit is to be assessed, but it is implied the rear or side lot abutting Regional roads shall be considered.

For the purposes of the NIS, OLAs (i.e., receiver location) were assessed at a height of 1.5 m and 3 m from the rear and/or side building façade.

5.2.1 Noise Sensitive Areas Identification

NSAs were selected that were representative of the acoustic environment within the Area of Investigation and the potential impact due to the Project.

As discussed in Section 2.2, for the purposes of the NIS, only existing sensitive land uses were evaluated with the understanding that project specific noise studies would be prepared in support of all future developments, and they will include the potential noise impacts due to the Project. Consequently, three NSAs were identified within the Area of Investigation, as shown in Figure 2.

Using orthoimagery, OLAs were identified for the dwellings within each NSA that are anticipated to be the most highly impacted due to the Project. Due to the standalone nature of the dwellings in the NSAs, OLAs were initially placed 3 m from the facades of both sides and the rear of each dwelling, unless that area appeared to be paved or heavily treed. Then a representative OLA for each dwelling, which corresponds to the OLA with the maximum noise level for each dwelling, was carried forward and discussed in the results section (Section 6.0). A total of 16 dwellings and 38 OLAs were identified. The identified OLAs considered in this assessment are shown in Figure 2.

5.3 Traffic Volumes

The existing and future noise levels were established using total traffic volumes provided by CIMA as Annual Average Daily Traffic (AADT) values for both 2017 and 2037. A turning count breakdown for the intersection was provided based on 2016 data, which were used to scale the AADT to determine 2017 and 2037 AADTs for each lane of the intersection. The percentage breakdown of heavy and medium trucks was based on 2016 traffic data provided by CIMA. The daytime and nighttime period percentage were assumed based on the Ontario Road

Noise Analysis Method for Environment and Transportation (ORNAMENT) Technical Document (MECP 1989). Traffic data is presented in Appendix B. Table 3 below provides the summary of traffic volumes for the roadways considered.

The following assumptions regarding traffic volumes were considered when conducting the noise prediction modelling:

- the 2037 AADTs are applicable for the prediction of future noise levels (i.e., 10 years after completion of construction or ultimate traffic) with and without the Project;
- the 2016 turning count vehicle type breakdown is applicable to 2017 and 2037, both with and without the Project.

Table 3: Traffic Data Summary

Roadway	AADT (2017)	AADT (2037)	% Commercial	Truck % (Medium/Heavy)	Time of Day % (Daytime/Nighttime) ¹	Speed Limit (km/h)
Northbound Albion Vaughan	8,294	10,209	5	1 / 4	90 / 10	60
Southbound Albion Vaughan	4,908	6,398	1	0 / 1	90 / 10	60
Eastbound King Street East	6,194	7,614	2	1 / 1	90 / 10	60
Westbound King Street East	8,080	11,544	5	0 / 5	90 / 10	60

Note:

¹: Daytime (16 Hours) – 07:00 to 23:00. Nighttime (8 Hours) – 23:00 to 07:00.

5.4 Assessment Criteria

For the purposes of the NIS, a combination of the Region of Peel’s Noise Barrier Policy and MTO Noise Guide assessment criteria presented in Section 4.0 were applied. An investigation of mitigation was carried out when noise levels greater than 60 dBA or an increase in noise levels greater than 5 dB are predicted at the OLA.

5.5 Noise Prediction Modelling

As required by the MTO and MECP guides, Golder used the approved “Ontario Road Noise Analysis Method for Environment and Transportation” (ORNAMENT) prediction methodology to predict for the proposed future conditions as well as with the existing conditions at the selected OLAs.

All predictions were carried out for the daytime (07:00 to 23:00), which represents a 16 hour equivalent sound level and is consistent with the MTO Noise Guide and the Region of Peel’s Noise Barrier Policy. Noise predictions were undertaken for three time frames: 1) existing (2017), 2) future (2037) without the Project, and 3) future (2037) with the Project. If the future noise levels are greater than 60 dBA or an increase in future noise levels greater than 5 dB were predicted at the OLA, investigation of mitigation was carried out.

In addition to including traffic volumes and respective traffic breakdowns for the relevant roadways, the following additional inputs were considered for modelling:

- angle of exposure from the roadway to the OLA;
- perpendicular distance between the roadway and the OLA;
- topography changes between the roadway and the OLA;
- pavement type of “average” acoustic absorption for the roadway;
- type of surface between the roadway and the OLA (i.e., hard versus soft ground);
- road grades;
- relative source and OLA heights; and
- posted speed limits.

The OLAs and topography changes between the roadway and OLA have been assumed to not change for all three time frames: 1) existing (2017), 2) future (2037) without the Project, and 3) future (2037) with the Project.

Following a conservative approach, the prediction modelling did not consider potential attenuation due to the presence of any woodlots or existing privacy fencing between the roadway and an OLA, but shielding from each OLAs’ associated dwelling was considered, if applicable.

Furthermore, the NIS considers traffic to be predominantly free-flowing along the Project roadways and does not include specific inputs for vehicles accelerating or decelerating. A more comprehensive assessment approach can be used at the detailed design stage, which can include certain acoustic effects of traffic flow controls.

6.0 RESULTS

Following the methodology described in Section 5.0, noise prediction modelling was completed using the ORNAMENT prediction model. The sections below summarizes the potential noise impact results due to the Project and provides an assessment of whether noise barriers would be potentially required along the Project Site.

6.1 Determination of Potential Noise Impacts

Table 4 below summarized the potential noise impact results at the representative OLAs which correspond to the OLA with the maximum predicted noise level for each dwelling. The input data for the ORNAMENT prediction model has been summarized in Appendix C. Results for all OLAs for each time frame are in Appendix D. A sample calculation using the MECP’s road traffic noise modelling software STAMSON V5.0 is presented in Appendix E.

Table 4: Summary of Predicted Road Traffic Noise Levels (Leq Daytime 16 hours) at Representative OLAs

Parameter	2017	2037 (Without Project)	2037 (With Project)
$L_{eq} \text{ Daytime 16 hours} \leq 55 \text{ dBA}$	0	0	0
$55 < L_{eq} \text{ Daytime 16 hours} < 60 \text{ dBA}$	1	0	0
$60 < L_{eq} \text{ Daytime 16 hours} < 65 \text{ dBA}$	13	14	14
$65 < L_{eq} \text{ Daytime 16 hours} < 70 \text{ dBA}$	2	2	2
$L_{eq} \text{ Daytime 16 hours} \geq 70 \text{ dBA}$	0	0	0
Total # of Representative OLAs	16	16	16

As presented in Section 5.4 above, for the purposes of the NIS, a combination of the Region of Peel's Noise Barrier Policy and MTO Noise Guide assessment criteria were applied.

Based on the results presented in Table 4 above and in Appendix D, the Region of Peel's noise level limit criterion of 60 dBA is exceeded in 2017 at 15 representative OLAs and at all 16 representative OLAs in 2037, both with and without the Project. As shown in the results in Appendix D, the predicted change in noise level in 2037, with and without the Project is 0 dBA at all OLAs which is less than the 5 dB threshold for the investigation of mitigation. Therefore, the effectiveness of potential noise mitigation was further investigated in Section 6.2.

6.2 Potential Mitigation Investigation

Based on the summary of results provided in Section 6.1, the investigation of noise mitigation was carried out. This section summarizes the acoustic performance of the proposed noise mitigation.

A single acoustic barrier layout that addressed all representative OLAs was considered along the Project ROW, as shown in Figure 3. Due to the non-continuous nature of the proposed barrier alignments and complex changes in topography (i.e., terrain elevations) between the residences and roadways, preliminary modelling of acoustic barrier performance was conducted using the Computer Aided Noise Attenuation (CadnaA) noise modelling software developed by DataKustik GmbH and applying the German road traffic algorithm RLS90. CadnaA is an acceptable noise prediction modelling software used within the industry to apply algorithms associated with predicting noise levels due to stationary and transportation noise sources. CadnaA can implement a number of modelling algorithms (e.g., ISO 9613, RLS90, TNM, FTA/FRA, etc.) for different types of noise sources and capable of dealing with GIS data, complex topography and generating noise contours. The RLS90 algorithm is commonly used within the industry as well when carrying out road traffic predictions within CadnaA. The CadnaA prediction model was calibrated to be similar to the ORNAMENT results. The barriers were modelled with a height of 2.4 m, consistent with the maximum height presented in the Region of Peel's Acoustical Report Guideline.

The preliminary noise modelling results indicate a reduction in noise level due this acoustic barrier layout ranged from 0.2 dB to 4.4 dB, which does not meet the Region of Peel's guidelines of a minimum of 5 dB reduction in noise level due to mitigation. As a result of the driveways that lead from the Project ROW to all dwellings within the Project area, noise barriers along the ROW cannot be continuous, which limits their effectiveness. Therefore, this acoustic barrier layout does not meet the MTO and Region of Peel assessment criteria.

Based on these results and various possible acoustic barrier layouts, Golder recommends further consultation with the Region of Peel and residents to develop an acoustic barrier layout that is technically, economically and administratively feasible.

6.3 Construction Phase Assessment

The construction phase of any project is typically considered temporary or short term relative to the entire life cycle of a project. The following is a summary of the items to be considered relating to construction noise according to applicable noise guidelines.

6.3.1 Construction Equipment and Activities

As construction noise could impact receptors in the vicinity of the Project, some general recommendations to assist in minimizing noise impacts due to the Project's construction equipment and activities are provided below:

- All construction equipment should be properly maintained according to manufacturer's recommendations and be in accordance MECP Model Municipal Noise Control by-law (i.e., NPC-115), where appropriate.
- If any of the construction activities involve Piling or Blasting, they should be carried out in accordance with OPSS 120 and MECP NPC-119.
- Construction equipment and/or activities typically known to be of annoyance (e.g., piling) should consider one of the following:
 - limit operating time within the daytime period when ambient noise levels are expected to be higher;
 - maintain an acceptable setback distance from the identified nearby NSAs, where practical;
 - carry out additional noise studies or monitoring program to verify and document noise levels;
 - implement temporary noise barriers or other localized noise mitigation measures (where practical); and
 - investigate other alternative construction equipment or processes to complete the task.

6.4 Noise Complaints Process

A process for dealing with noise complaints during the construction phase should be considered. Noise complaints are usually received directly from the complainant or a municipal by-law officer. Note that compliance with noise guidelines or regulations does not ensure noise complaints will not occur. The following is a general recommended process for dealing with noise complaints based on Golder's past project experiences:

- Identify an individual or group on the Project (Site Supervisor, Health and Safety representative, etc.) to handle the noise complaints and someone that can be easily contacted.
- Document the noise complaint. Include the date, time and the individual's contact information from whom the noise complaint was received. Specific information such as the location, duration, time and type of sound heard (steady, impulsive, etc.) should be included as it will assist in the investigation process. Be aware of any time constraints put in place by the municipality for the noise complaint to be addressed.
- Investigate the noise complaint and identify the source of the noise complaint. Document the investigation.
- If the noise complaint is justified, in that excessive noise levels were generated, minimize or eliminate the source of the noise complaint. Document the action taken.

- Follow up with the complainant and provide the results of the noise complaint investigation.

6.5 Applicable By-Laws

Golder reviewed applicable by-laws to identify applicable requirements. Generally, each regulating jurisdiction has a by-law dealing with noise, with often slightly differing by-law requirements. There are two jurisdictions with by-law authority in the vicinity of the Project, Town of Caledon and the City of Vaughan.

Through an initial review of the Town of Caledon By-Law #86-110 (Town of Caledon Noise By-Law), construction projects are subject to a noise curfew between the hours of 23:00 to 06:00. One may apply and seek approval for a noise by-law exemption for construction equipment. Further discussion between the Town of Caledon and relevant parties regarding noise by-law exemptions may be required.

Through an initial review of the City of Vaughan By-Law #96-2006 (City of Vaughan Noise By-Law), construction projects operating construction equipment are subject to a noise curfew between the hours of 19:00 to 07:00 on Monday through Saturday in residential areas with no operation of construction equipment on Sundays or Statutory Holidays. Noise from construction equipment are subject to a curfew from 17:00 to 07:00 on Monday through Saturday in quiet zones with no operation of construction equipment on Sundays or Statutory Holidays. One may apply and seek approval for a noise by-law exemption for construction equipment provided they satisfy the requirements of the By-Law. Further discussion between the City of Vaughan and relevant parties regarding noise by-law exemptions may be required.

7.0 CONCLUSIONS

This NIS provides a summary of the noise impact assessment for the Project on the neighbouring sensitive receptors and identifies: the applicable municipal noise by-law, describes a noise complaint process for construction activities, and provides a general discussion regarding noise arising from construction activities.

Based on the Noise Impact Study carried out by Golder Associates Ltd. for CIMA+, the following conclusions were determined:

- The Region of Peel's Noise Barrier Policy noise level limit criterion of 60 dBA has been exceeded at all identified representative OLAs when considering future traffic volumes.
- Based on preliminary modelling, noise barriers along the Project ROW were predicted to provide less than 5 dB of attenuation at the OLAs. Based on these results and various possible acoustic barrier layouts, Golder recommends further consultation with the Region of Peel and residents to develop an acoustic barrier layout that is technically, economically and administratively feasible.
- An outline regarding construction noise, a noise complaint process and the applicable noise by-law during the construction phase of the Project has been provided. Based on a review of available information, an exemption from the applicable by-law may be required.

8.0 REFERENCES

Region of Peel. (June 1996). Noise Attenuation Barriers Policy No. W30-04.

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Ontario Ministry of Transportation. (October 2006). Environmental Guide for Noise.

Ontario Ministry of the Environment, Conservation and Parks. (October 1989). Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) Technical Document.

Signature Page

Golder Associates Ltd.



Stefan Cicak, B.A.Sc., P.Eng.
Acoustics, Noise and Vibration Engineer



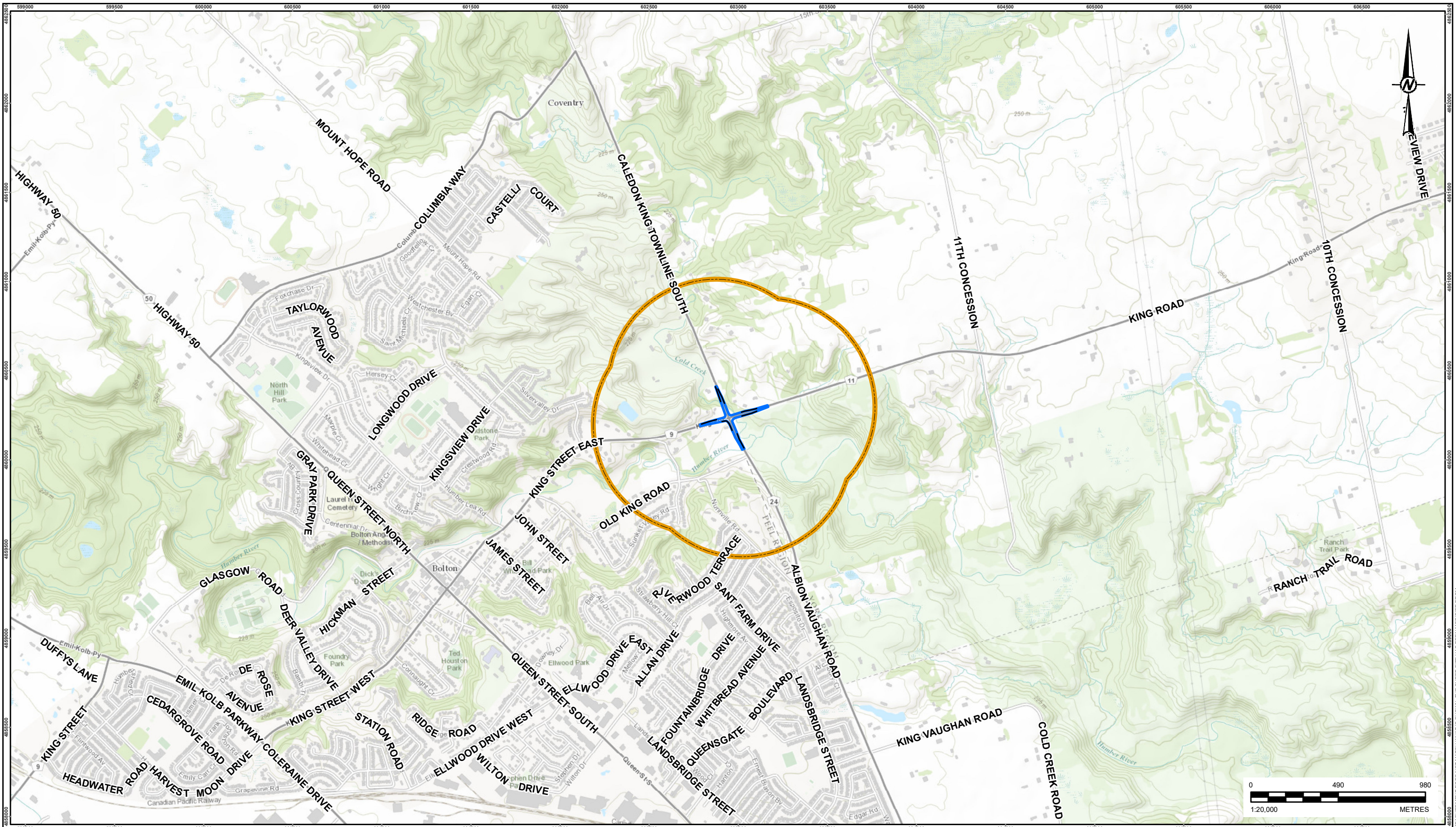
Joe Tomaselli, M.Eng., P.Eng.
Associate/Acoustics, Noise and Vibration Engineer

SD/SC/JT/ly

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FIGURES



- LEGEND**
- ★ Project Site
 - Area of Investigation

REFERENCES
 BASEDATA - MNRF LIO, OBTAINED 2017
 PRODUCED BY GOLDER ASSOCIATES LTD UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEEN'S PRINTER 2016
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CLIENT
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REVIEW	SD
APPROVED	SC

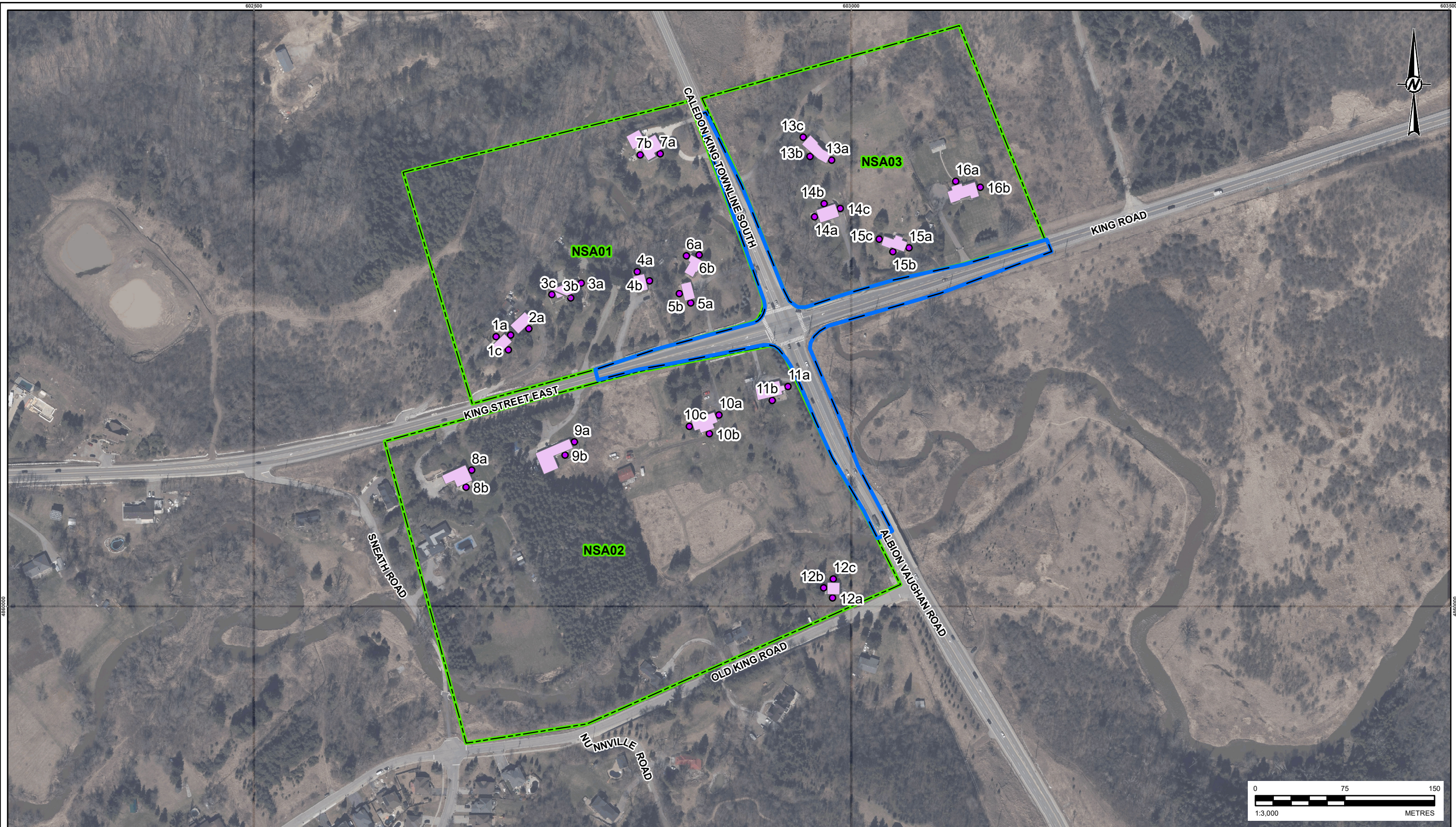
PROJECT
 MUNICIPAL CLASS EA ALBION VAUGHAN ROAD AND KING STREET NOISE IMPACT STUDY

TITLE
SITE LOCATION

PROJECT NO.	PHASE	REV.	FIGURE
1664714	0	A	1

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- LEGEND**
- Outdoor Living Area (OLA)
 - Buildings
 - Noise Sensitive Area (NSA)
 - Project Site

REFERENCES
 BASEDATA - MNRF LIO, OBTAINED 2017
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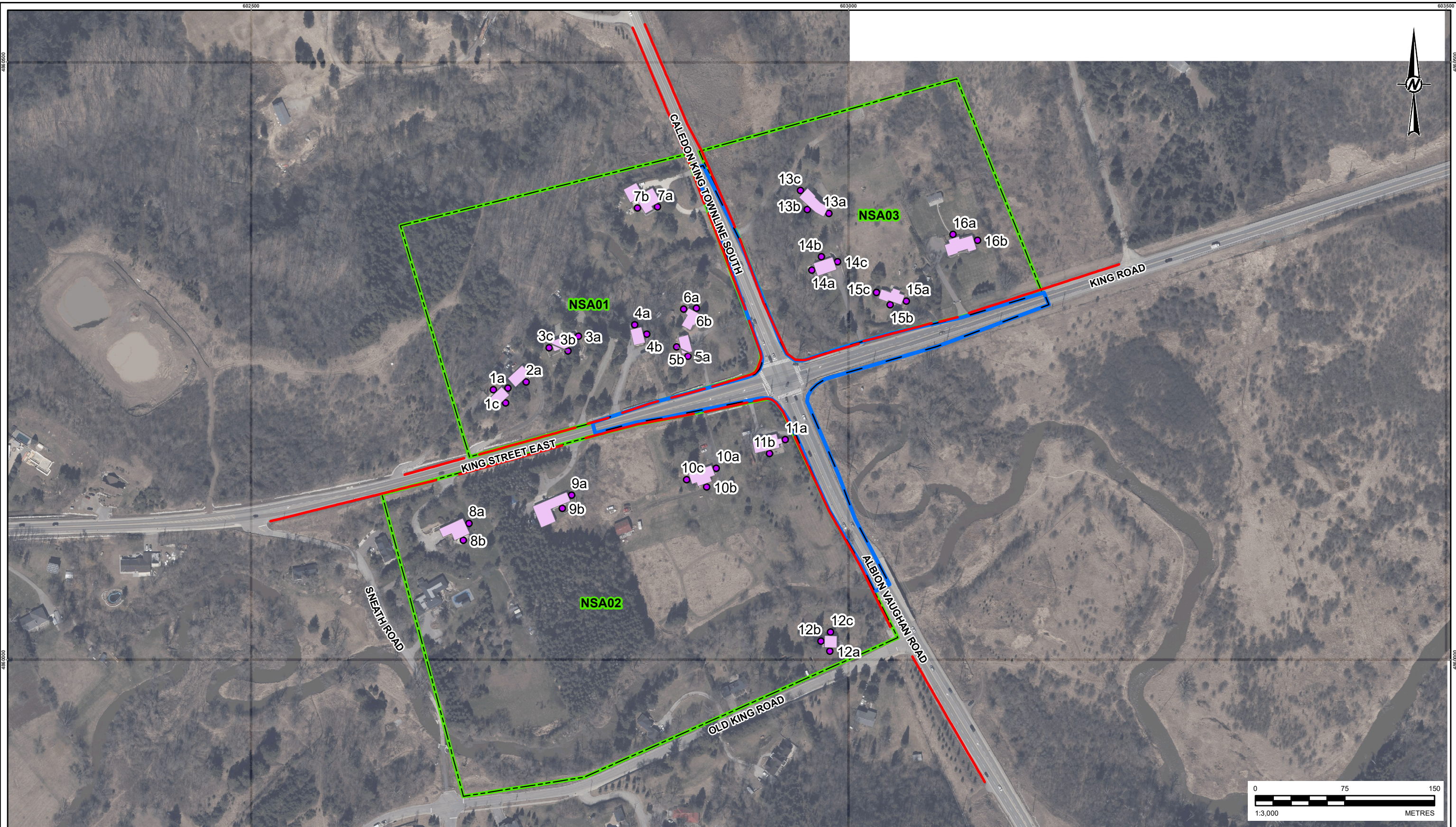
PROJECT
 MUNICIPAL CLASS EA ALBIN VAUGHAN ROAD AND KING
 STREET NOISE IMPACT STUDY

TITLE
NOISE SENSITIVE AREAS AND OUTDOOR LIVING AREAS

PROJECT NO. 1664714	PHASE 0	REV. A	FIGURE 2
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- LEGEND**
- Outdoor Living Area (OLA)
 - Buildings
 - Noise Sensitive Area (NSA)
 - Project Site
 - Noise Barrier

REFERENCES
 BASEDATA - MNRF LIO, OBTAINED 2017
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PROJECT
 MUNICIPAL CLASS EA ALBION VAUGHAN ROAD AND KING
 STREET NOISE IMPACT STUDY

TITLE
INVESTIGATED NOISE BARRIERS

PROJECT NO. 1664714	PHASE 0	REV. A	FIGURE 3
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APPENDIX A

Relevant Guidelines and Policies

DATE: August 26, 2015

REPORT TITLE: **LOCAL IMPROVEMENT PROCESS FOR PRIVATELY OWNED NOISE ATTENUATION WALLS ALONG REGIONAL ROADS**

FROM: Dan Labrecque, Commissioner of Public Works

RECOMMENDATION

That a program to rebuild private noise attenuation walls adjacent to Regional Roads and to relocate them onto the public side of the Regional Road be supported in principle;

And further, that staff be directed to amend the Region of Peel development approval process to permit the installation of noise attenuation walls adjacent to Regional Roads on the public side of the Regional Road right-of-way;

And further, that staff report back to Regional Council with a more detailed implementation plan so that funding requirements for Regional ownership of private noise attenuation walls can be included in future budgets for Council consideration;

And further, that a copy of the report of the Commissioner of Public Works titled “Local Improvement Process for Privately Owned Noise Attenuation Walls Along Regional Roads” be sent to the Cities of Brampton and Mississauga, and the Town of Caledon for information.

REPORT HIGHLIGHTS

- Currently, there are different processes among the Region of Peel and its area municipalities dealing with the Local Improvement Process for privately owned noise attenuation walls.
- There are advantages to re-constructing private noise attenuation walls and relocating them on the public right-of-way to better address matters of public safety, aesthetics through consistent specifications and re-construction methods, and improving customer service.
- Assuming ownership of privately owned noise attenuation walls adjacent to Regional Roads would cost the Region approximately \$55 million in replacement and maintenance costs over the next 30 years.

August 26, 2015

LOCAL IMPROVEMENT PROCESS FOR PRIVATELY OWNED NOISE ATTENUATION WALLS ALONG REGIONAL ROADS

DISCUSSION

a) Background

Over the years staff has brought forward several reports on Regional noise attenuation wall levels of service, repair and replacement under the Local Improvement Process. Most recently, in 2011 staff brought forward a report highlighting that the Region does not fund the full cost of repair and replacement of private noise attenuation walls abutting Regional Roads (see Appendix I). Based on that report, Council's current direction is:

- That Corporate Policy W30-04 Noise Attenuation Barriers, which uses the local improvement process to provide for a special assessment to homeowners to cost share 50:50 with the Region (subject to available funding), be maintained.

Throughout Peel there are different approaches to applying the Local Improvement Program for privately owned noise attenuation walls. Through recent discussions with senior staff from the Cities of Brampton and Mississauga, and the Town of Caledon there is recognition to look at the issue universally from a customer service vantage point. In particular, one can view private noise attenuation walls adjacent to Regional Roads being designed to mitigate noise from inter-regional traffic well beyond the immediate neighbourhood. Therefore, a universal application of financial compensation across the Region would ensure equity among residents.

The development approval process governs the placement and material of noise attenuation walls. When a subdivision is planned along a Regional Road, developers are required to construct noise attenuation walls on private property. During the lifespan of the wall, any repair/replacement or upgrade is the responsibility of the property owner. In many instances, this is where the issue arises as the property owner views the fence as similar to all other public infrastructure, and the repair or replacement should be the responsibility of the Region.

To be proactive and prevent this situation from occurring it is recommended that the development approvals process be amended so that new walls are constructed on the public side of the Regional Road right-of-way. For existing situations, staff recommends the Region re-construct private noise attenuation walls on the public right-of-way once the walls are deemed to be at the end of their operational life. In both instances, these processes will help to ensure design specifications and construction methods are consistent.

b) Current Situation – Policy Regime and Financial Models

1. Policy Regime - Local Improvement Process

Under the *Municipal Act, 2001, Ontario Regulation 586/06*, allows the municipality to pass a by-law to undertake the work as a local improvement for the purpose of raising all or any part of the cost of work by imposing a special charge on the affected properties. The Region of Peel's Corporate Policy W30-04 provides for the replacement of private noise attenuation walls with a special assessment apportioning 50 percent of the final cost to the homeowner and 50 percent to the Region. Over the past decade, there have been five local improvement noise attenuation walls applications initiated of which only two have been approved in the City of Mississauga along Erin Mills Parkway between the Collegeway and South Millway. Many applications under the Local Improvement Process do not meet the initial requirements to proceed to the petition process. As there

August 26, 2015

LOCAL IMPROVEMENT PROCESS FOR PRIVATELY OWNED NOISE ATTENUATION WALLS ALONG REGIONAL ROADS

is no formal budget in the Region's Transportation Capital Program for approved local improvement noise attenuation wall replacement, the projects that have been approved were financially managed as one-off budget initiatives presented to Council.

2. Financial Models Across Peel

At the moment the Town of Caledon does not have a program for noise attenuation walls. However, in recent discussions with the Town, this issue is being pursued with the intention to develop a policy and program for the repair and replacement. Table 1 below shows the array of funding models between the Region and the Cities of Brampton and Mississauga. The major differences are those outside of capital projects, in particular the application and funding for projects under Local Improvement Process.

Table 1: Current Funding Models

Project Type and Program	Agency and Funding Source		
	Region of Peel	City of Brampton	City of Mississauga
Resident Requested - New Wall, Repair or Retrofit Local Improvement (subject to Council approval).	50% - Tax 50% - Homeowner	75% - Development Charges 25% - Homeowner	50% - Tax 50 % - Homeowner
Replacement Program (subject to Council approval)	Local Improvement Process	Local Improvement Process	100% - Tax
Capital Project – Where need is identified through an Environmental Assessment (i.e. Road Widening)	100 % Development Charges	90-95% Development Charges 5-10% Tax	100 % Development Charges

August 26, 2015

LOCAL IMPROVEMENT PROCESS FOR PRIVATELY OWNED NOISE ATTENUATION WALLS ALONG REGIONAL ROADS

c) Asset Management Overview – Condition Rating and Replacement Costs

Table 2 provides a desktop review of privately owned noise attenuation walls adjacent to Regional Roads revealing that the majority have a condition rating of “Good”. Appendix II shows the Region’s noise attenuation wall condition rating. Of note from Table 3, the majority of spending on replacements for private walls is projected to occur in the next 20 years. This translates to approximately \$50M being spent by 2035, which is 90 percent of the required amount for the 30 year projection. Appendix III shows the location of private walls within the first ten years of the 30 year forecast.

Table 2: Privately Owned Noise Attenuation Walls Abutting Regional Roads

Jurisdiction	Rating by Length (m)				Total
	Excellent	Good	Fair	Poor	
Mississauga	0	2,188	4,153	2,060	8,401
Brampton	481	12,369	6,561	2,553	21,964
Caledon	0	1,669	631	0	2,300
Total	481	16,226	11,346	4,613	32,666

Table 3: Private Noise Attenuation Walls Abutting Regional Roads – Replacement Costs

Municipality	2015 Replacement and Maintenance Costs (\$M)/Estimated Total	Replacement Dollars Expected		
		10 Yrs.	10-20 Yrs.	20-30 Yrs.
Mississauga	\$14.1	\$10.3	\$3.6	\$0.2
Brampton	\$36.9	\$8.9	\$23.9	\$4.1
Caledon	\$3.9	\$0.7	\$2.0	\$1.1
Total	\$55.0	\$20.0	\$29.5	\$5.4
Percentage of inventory to be replaced		36%	54%	10%

August 26, 2015

LOCAL IMPROVEMENT PROCESS FOR PRIVATELY OWNED NOISE ATTENUATION WALLS ALONG REGIONAL ROADS

FINANCIAL IMPLICATIONS

Assuming the ownership of private noise attenuation walls adjacent to Regional Roads would be a new financial obligation for Peel, totalling \$55 million over the next 30 years. This equates to an average cost of approximately \$2 million per year, which is in addition to the \$500,000 per year the Region currently budgets for the replacement and repairs of Regionally owned noise attenuation walls. The additional \$2 million per year would allow for a linear annual program of approximately 1,200 metres (3,937 feet) to be repaired and replaced. Should Council decide to assume private noise attenuation walls, this new financial responsibility would result in additional pressure on the Region's capital reserves. Staff will include this pressure as part of its annual adequacy of reserves assessment to be reported to Council in October.

NEXT STEPS

Subject to Council direction, it is proposed that staff initiate a work plan to program privately owned noise attenuation walls adjacent to Regional Roads in the 2017 capital plan. The work plan will be undertaken over the next 12 months and consist of activities listed below. At this time, no additional staff resources are anticipated to deliver the work plan.

1. Amending the development approvals process to construct noise attenuation walls on the public side of the Regional Road right-of-way.
2. Prioritization of high, medium, and low projects within the 30 year forecast for consideration in the 2017 Capital Budget.
3. Develop an inspection program for privately owned walls; including work required for utility impacts, easements, and additional resources.
4. Develop of a communication package to ensure residents are informed of the new program and what is eligible for 100 percent funding.

CONCLUSION

Replacing private noise attenuation walls adjacent to Regional Roads and moving them onto the Regional Right-of-Way has several advantages, including: public safety, maintaining an aesthetically pleasing design and streetscape (which can be difficult if reconstruction is left to property owners), and alignment across the Region in terms of financial compensation. This policy shift adds a new financial obligation for Peel of approximately \$2M per year for the next 30 years. Staff is seeking Council direction on how to proceed.



Dan Labrecque, Commissioner of Public Works

Approved for Submission:



D. Szwarc, Chief Administrative Officer

August 26, 2015

**LOCAL IMPROVEMENT PROCESS FOR PRIVATELY OWNED NOISE ATTENUATION
WALLS ALONG REGIONAL ROADS**

APPENDICES

Appendix I – Council Report, July 7, 2011: The Condition of Noise Attenuation Walls Along Regional Roads and the Effectiveness of the Local Improvement Process

Appendix II – Noise Attenuation Wall Rating System

Appendix III – 10 Years Private Noise Attenuation Wall Replacement Plan (2016-2025)

For further information regarding this report, please contact Steve Ganesh, Manager, Infrastructure Programming and Studies, extension 7824, steve.ganesh@peelregion.ca.

Authored By: Steve Ganesh

*Reviewed in the workflow by:
Financial Support Unit*

**APPROVED AT REGIONAL COUNCIL
July 7, 2011**

PW-C. TRANSPORTATION

**PW-C3. The Condition of Noise Attenuation Walls Along Regional Roads and
the Effectiveness of the Local Improvement Process**

Moved by Councillor McCallion;
Seconded by Councillor Mahoney;

That the current levels of service for Region-owned noise
attenuation walls be maintained;

And further, that Corporate Policy W30-04 Noise Attenuation
Barriers, which uses the local improvement process to provide for a
special assessment to homeowners to cost share 50:50 with the
Region (subject to available funding), be maintained;

And further, that replacement of, or repair to private noise
attenuation walls and/or fencing remain the responsibility of affected
property owners.

Carried

2011-683



REPORT
Meeting Date: July 7, 2011
Regional Council

DATE: June 1, 2011

REPORT TITLE: **THE CONDITION OF NOISE ATTENUATION WALLS ALONG REGIONAL ROADS AND THE EFFECTIVENESS OF THE LOCAL IMPROVEMENT PROCESS**

FROM: Dan Labrecque, Commissioner of Public Works

RECOMMENDATION

That the current levels of service for Region-owned noise attenuation walls be maintained;

And further, that Corporate Policy W30-04 Noise Attenuation Barriers, which uses the local improvement process to provide for a special assessment to homeowners to cost share 50:50 with the Region (subject to available funding), be maintained;

And further, that replacement of, or repair to private noise attenuation walls and/or fencing remains the responsibility of affected property owners.

REPORT HIGHLIGHTS

- Council directed staff to report back on the condition of noise attenuation walls abutting Regional Roads and the effectiveness of the local improvement process. The assessment was to include information on the specific sections of Finch Avenue and Kennedy Road.
- Private fences located on both sides of Kennedy Road between Vodden Street East and Townsend Gate/Linkdale Road in the City of Brampton are in poor condition and visually unattractive. A local improvement petition was unsuccessful for replacing the fence with a noise attenuation wall.
- A private subdivision noise attenuation wall located along Finch Avenue between Darcel Avenue and Highway 427 in the City of Mississauga is in poor condition. A local improvement petition has not been initiated to replace the private noise attenuation wall.
- Corporate Policy W30-04 provides homeowners an opportunity to cost share 50:50 (based on actual final project costs) with the Region for replacement of noise attenuation walls using the local improvement process.
- At this time, the Region's Transportation Capital program is not fully funded. Staff suggests that the priority should be to focus on maintaining the Region's current assets and as such, staff would not recommend taking on any new financial liabilities associated with private noise walls or private fences.

June 1, 2011

THE CONDITION OF NOISE ATTENUATION WALLS ALONG REGIONAL ROADS AND THE EFFECTIVENESS OF THE LOCAL IMPROVEMENT PROCESS

DISCUSSION

1. Background

Regional Council, at its meeting held on July 8, 2010, requested that the Commissioner of Public Works report back to a future meeting on the following items:

- a) an update on the condition of existing noise attenuation walls abutting Regional roads, and in particular Kennedy Road north of Vodden Street in the City of Brampton;
- b) information regarding noise attenuation along Finch Avenue between Darcel Avenue and Highway. 427 in the City of Mississauga; and,
- c) Information on the effectiveness of the local improvement program.

2. Region Owned and Private Noise Attenuation Walls Condition Reports

a) Region Owned Noise Attenuation Walls

A condition assessment of Regional noise attenuation walls was completed in 2010 and indicates that the walls are overall in good condition. They are evaluated, monitored and maintained on an ongoing basis. Following is a summary of information for the Region owned noise attenuation walls.

Region Owned Noise Attenuation Walls					
Location	Length (metres)	Today's Replacement Value (millions \$) (based on cost of \$1,350/metre)	Cost of walls requiring replacement within 10 yrs. (millions \$)	Cost of walls requiring replacement within 10-20 yrs. (millions \$)	Cost of walls requiring replacement within 20-30 yrs. (millions \$)
Mississauga	13,027	\$17.8	\$ 4.9	\$ 8.6	\$ 4.2
Brampton	9,807	\$13.2	\$ 1.1	\$ 6.0	\$ 6.0
Caledon	0	\$ -	\$ -	\$ -	\$ -
Total	22,834	\$31.0	\$ 6.0	\$ 14.6	\$10.2

b) Private Noise Attenuation Walls Abutting Regional Roads

Regional staff undertook a desktop data collection and condition assessment of private noise walls to evaluate their current condition. Following is a summary of information for the private noise attenuation walls.

Private Noise Attenuation Walls Abutting Regional Roads					
Location	Length (metres)	Today's Replacement Value (millions \$) (based on cost of \$1,350/metre)	Cost of walls requiring replacement within 10 yrs. (millions \$)	Cost of walls requiring replacement within 10-20 yrs. (millions \$)	Cost of walls requiring replacement within 20-30 yrs. (millions \$)
Mississauga	8,402	\$ 11.3	\$ 2.4	\$ 6.2	\$ 2.7
Brampton	21,964	\$ 29.7	\$ 3.0	\$ 7.7	\$ 18.9
Caledon	2,300	\$ 3.1	\$ -	\$.6	\$ 2.5
Total	32,666	\$ 44.1	\$ 5.4	\$14.5	\$ 24.1

June 1, 2011

THE CONDITION OF NOISE ATTENUATION WALLS ALONG REGIONAL ROADS AND THE EFFECTIVENESS OF THE LOCAL IMPROVEMENT PROCESS

c) Condition of Private Fences on Kennedy Road and Private Noise Attenuation Walls on Finch Avenue

i) Kennedy Road Fence

The homes in question have municipal addresses on Greene Drive and Kingswood Drive (streets that run parallel to Kennedy Road between Vodden Street East and Townsend Gate/Linkdale Road) and their rear yards abut Kennedy Road. The rear yards are fenced (not noise attenuation walls), many with gate access to Kennedy Road. The fences are either wood or chain link with ad hoc styles and maintenance.

Though residents were approached in 2007 about replacing the fence with a noise attenuation wall, there was little enthusiasm from the residents to move ahead with this solution for the following reasons:

- back gates give residents easy access to Kennedy Road transit, shopping, schools, etc. ;
- materials intended for backyard use can be delivered through gates and do not have to be taken through the house;
- limited financial ability of owners to afford local improvement cost sharing agreement.

The noise attenuation walls that were replaced in 2005 located north of Townsend Gate/Linkdale Road on Kennedy Road are Regionally-owned.

ii) Finch Avenue Private Noise Attenuation Walls

The concrete subdivision noise attenuation wall located along Finch Avenue between Darcel Avenue and Highway 427 in the City of Mississauga is in poor condition and continues to deteriorate. Residents could request replacement of the noise attenuation wall under the Region's local improvement process however to date, the Region has not received a request to initiate a local improvement for this portion of Finch Avenue.

Pictures are provided for both locations in Appendix I.

3. The Local Improvement Process

The Region of Peel's Corporate Policy W30-04 (Appendix III) provides for replacement of private noise attenuation walls with a special assessment which apportions 50 percent of the final cost to the homeowners with 50 percent paid by the Region. The local improvement process is described in detail in Appendix II.

Regional staff reviewed the success of the local improvement process over the past decade. There have been 84 enquiries from the public regarding deteriorating private noise walls and three applications for a local improvement noise attenuation wall initiated. Out of these applications one noise attenuation wall has been successfully constructed. One noise attenuation wall is pending for construction in 2011. Details of the projects are as follows:

- 2005 – A condominium corporation requested replacement of their noise attenuation wall which abuts Derry Road. The petition process was successful

June 1, 2011

THE CONDITION OF NOISE ATTENUATION WALLS ALONG REGIONAL ROADS AND THE EFFECTIVENESS OF THE LOCAL IMPROVEMENT PROCESS

and the by-law for the construction of the noise attenuation wall was passed by Council. However, when the project was tendered by the Region, the condominium corporation requested that the project be cancelled.

- 2007 - A condominium corporation on Erin Mills Parkway successfully replaced a private subdivision noise attenuation wall using the local improvement process.
- 2010 - A condominium corporation on Erin Mills Parkway was successful in their noise wall petition and construction is scheduled for the fall of 2011.

There are many enquiries from the public regarding the local improvement process; however most do not meet the initial requirements to proceed to the petition process.

Condominium corporations are the most successful users of the local improvement policy since the noise attenuation wall is considered an element in common between all homeowners in the condominium, and the cost can be spread between all owners and/or covered through the condominium board's reserve funds.

4. Local Municipal Funding Practices for Replacement of Private Noise Attenuation Walls

Local municipalities have funding strategies that differ from the Region of Peel. These differences are summarized below.

City of Mississauga

City of Mississauga policy provides for 100 percent City funding for the replacement of deteriorated private noise attenuation walls. City funding is subject to Council approval.

City of Brampton

City of Brampton policy provides for a 75/25 split with 75 percent paid by the City and 25 percent paid by the property owners for replacement of deteriorated private noise attenuation walls. City funding is subject to Council approval and the availability of funding.

Town of Caledon

The Town of Caledon has not replaced any noise attenuation walls through the local improvement process.

5. Region's Financial Exposure under Various Local Improvement Funding Options

The following chart illustrates the financial implications of changes to the current 50/50 special assessment cost share for the replacement of private noise attenuation walls. (The figures are based on the current replacement value of private noise attenuation walls abutting Regional roads.)

	Funding Options		
	Current 50% Region - 50% Homeowners	75% Region - 25% Homeowners	100% Region
Region's Current and Potential Financial Exposure (millions\$)	\$ 22.05	\$ 33.08	\$ 44.1

June 1, 2011

THE CONDITION OF NOISE ATTENUATION WALLS ALONG REGIONAL ROADS AND THE EFFECTIVENESS OF THE LOCAL IMPROVEMENT PROCESS

There is no formal budget allocation established for approved local improvement noise attenuation wall replacements. To date, the projects that have been approved are managed as one-off budget initiatives. A fundamental shift in policy such as changing the current funding ratio would require sustainable adjustments to the longer term "state of good repair" financing plan.

Given the underfunded status of the Region's Transportation Capital program, staff recommends that the current 50/50 cost sharing special assessment with homeowners be retained.

6. Private Fences and Development of Noise Attenuation Walls

Staff has not determined the length of existing private fences along Regional roads for this report. However, given the amount of potential fence replacement required within the Region, and the underfunded status of the Region's Transportation Capital program, staff recommends that replacement and/or repair of deteriorating fencing located on private property should remain the sole responsibility of the affected property owners. Funding for repair, replacement and/or long-term maintenance should not be provided for by the Region.

CONCLUSION

1. Regional noise attenuation walls are in good condition and are maintained on an ongoing basis. Staff recommends maintaining the current level of service for Region-owned noise attenuation walls.

Some private noise attenuation walls are in very poor condition, visually unsightly and may pose a safety risk within the right-of-way. The maintenance of private noise attenuation walls remain problematic, but should rest with homeowners and be enforced at the local municipal level.

2. There is no current Regional solution for replacement of the fences along Kennedy Road since there is no desire by homeowners to replace with a noise attenuation wall.

The noise attenuation walls along Finch Avenue between Darcel Avenue and Highway 427 are private subdivision walls. Although the noise attenuation walls would qualify for replacement under the local improvement process, the Region has not received a request to initiate the local improvement process.

3. Use of the local improvement process for noise attenuation walls to replace deteriorating private walls has a low success rate. This lack of success may be related to the following factors.
 - Cost for some homeowners may be prohibitive, even with a 50/50 cost share.
 - The process is involved and collection of signatures is time-consuming for the initiator. Low chance of success for the petition can be a disincentive to start the process.
 - The public may be unaware of the local improvement process.

However at this point in time, the current local improvement policy special assessment for 50 percent of the final costs to homeowners is equitable, given the overall underfunded status of the Region's Transportation Capital program.

June 1, 2011

THE CONDITION OF NOISE ATTENUATION WALLS ALONG REGIONAL ROADS AND THE EFFECTIVENESS OF THE LOCAL IMPROVEMENT PROCESS

4. Private noise attenuation walls continue to deteriorate along Regional roads creating both an aesthetic and functional liability in its rights-of-way. Residents with deteriorating walls are not using the local improvement process to replace the walls.
5. The local municipalities have replacement policies that are different to the Region's creating confusion and at times, a perception of unfairness.
6. Given the amount of potential fence replacement required within the Region, and the underfunded status of the Region's Transportation capital program, staff recommends that replacement and/or repair of deteriorating fencing located on private property should remain the sole responsibility of the affected property owners



Dan Labrecque
Commissioner of Public Works

Approved for Submission:



D. Szwarc, Chief Administrative Officer

For further information regarding this report, please contact Liz Brock at extension 7902 or via email at liz.brock@peelregion.ca

gla *L.B.* Authored By: Liz Brock

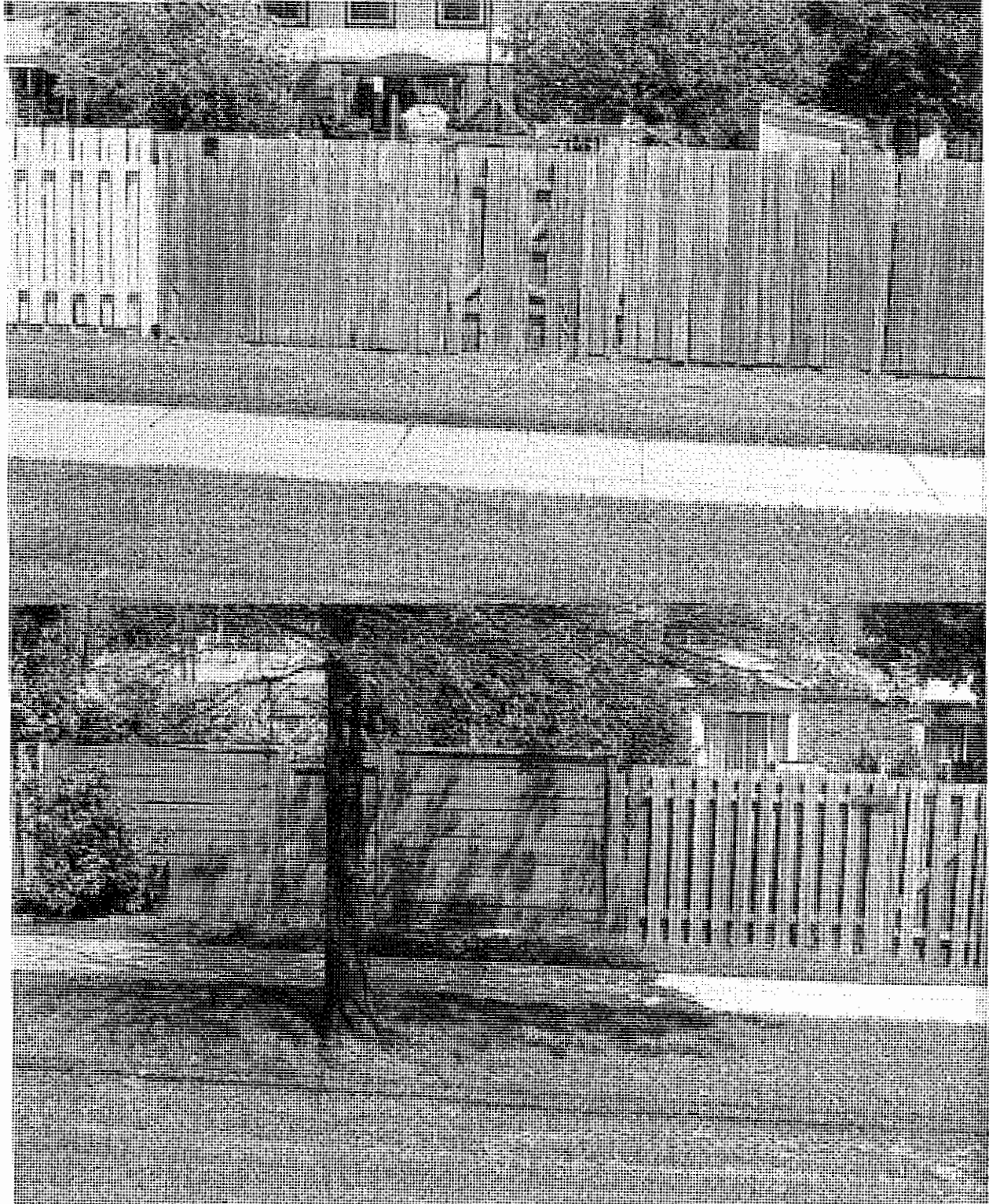
ML c. Legislative Services

June 1, 2011

**THE CONDITION OF NOISE ATTENUATION WALLS ALONG REGIONAL ROADS AND THE
EFFECTIVENESS OF THE LOCAL IMPROVEMENT PROCESS**

APPENDIX I

**T Private fence along Kennedy Road between Vodden Street East and Townsend Gate/Linkdale
Road**

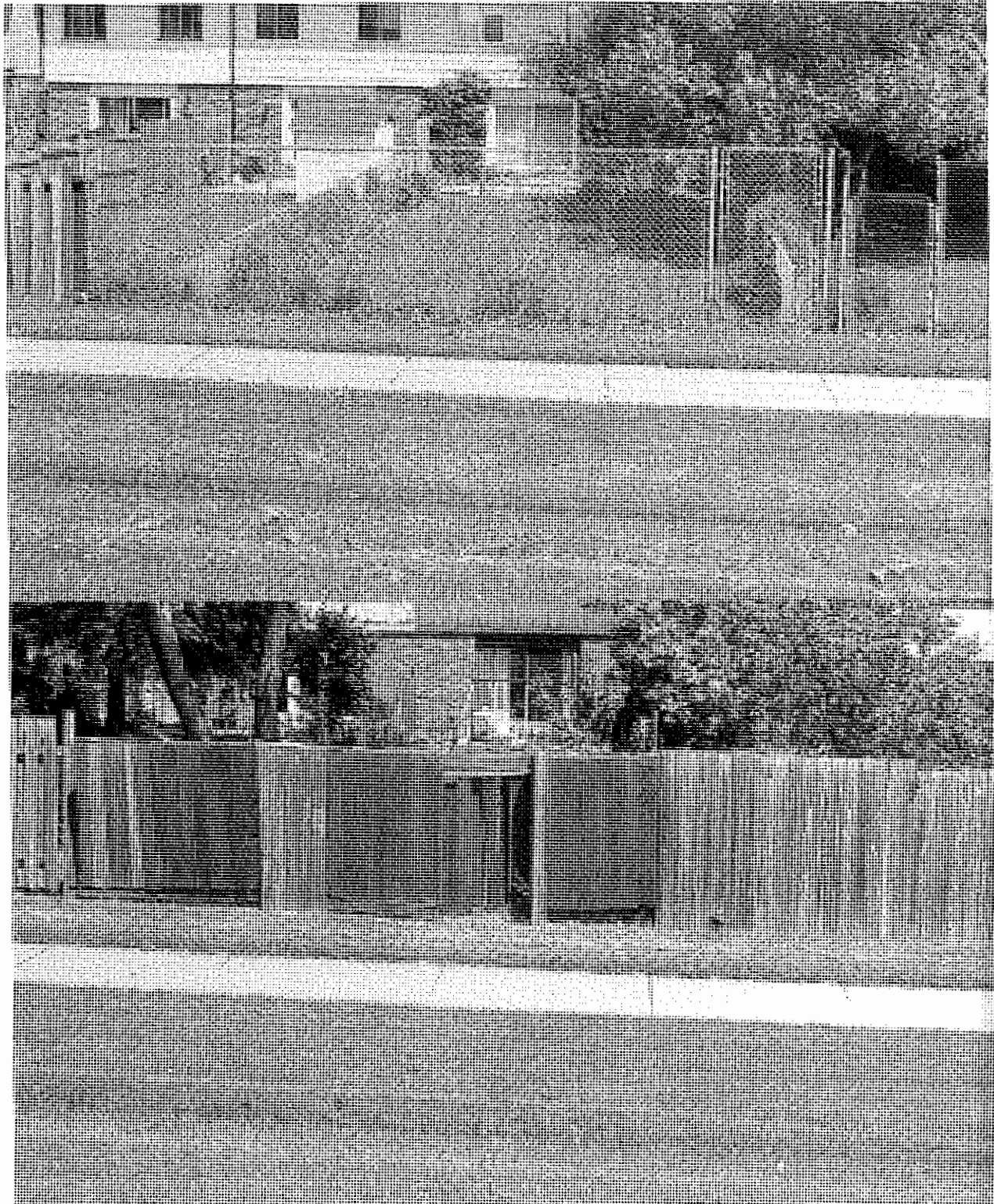


APPENDIX I

June 1, 2011

**THE CONDITION OF NOISE ATTENUATION WALLS ALONG REGIONAL ROADS AND THE
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**Private fence along Kennedy Road between Vodden Street East and Townsend Gate/Linkdale
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APPENDIX I

June 1, 2011

**THE CONDITION OF NOISE ATTENUATION WALLS ALONG REGIONAL ROADS AND THE
EFFECTIVENESS OF THE LOCAL IMPROVEMENT PROCESS**

Private subdivision noise attenuation wall Finch Avenue - between Darcel Avenue & Hwy 427

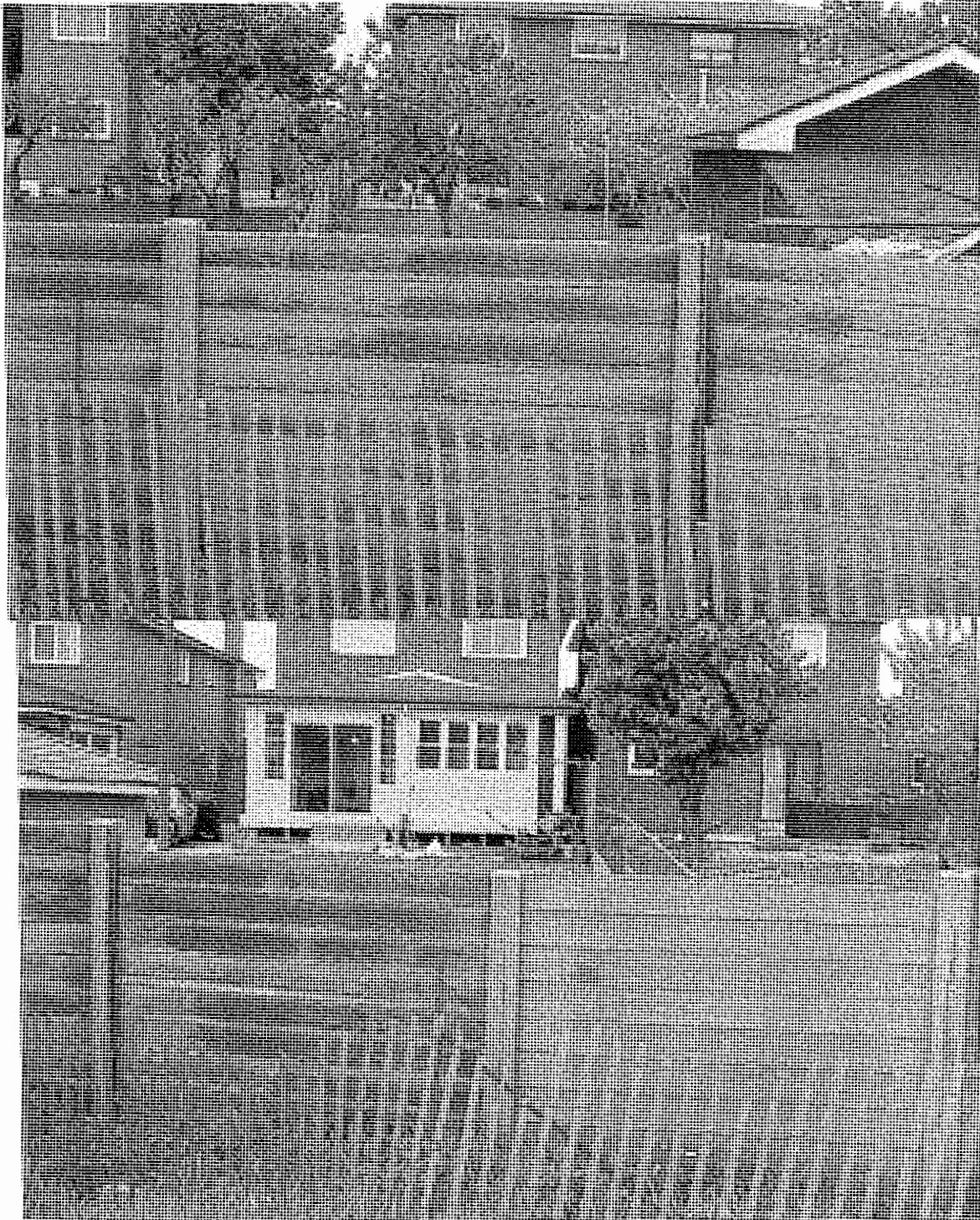


APPENDIX I

June 1, 2011

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Private subdivision noise attenuation wall Finch Avenue - between Darcel Avenue & Hwy 427



June 1, 2011

THE CONDITION OF NOISE ATTENUATION WALLS ALONG REGIONAL ROADS AND THE EFFECTIVENESS OF THE LOCAL IMPROVEMENT PROCESS

APPENDIX II

Local Improvements

Local improvements are owner-initiated requests for municipal services administered pursuant to the *Municipal Act, 2001, Ontario Regulation 586/06*. The Act offers communities a fair and impartial method of obtaining municipal services by sharing the costs with the municipality.

The Regulation allows the municipality to pass a by-law to undertake the work as a local improvement for the purpose of raising all or any part of the cost of the work by imposing a special charge on the affected properties. The Region's cost share agreement for a noise attenuation wall is 50/50 with property owners.

Residential properties with reverse frontage (a rear or side lot abutting a Regional road) and experiencing a daytime noise level of 60 decibels or higher during daytime hours (i.e. 7:00 a.m. – 11:00 p.m.) are eligible for a noise wall under the *Local Improvement Act*. As well, there must be at least three properties that would benefit from the wall to qualify and the proposed works are not dependent on whether the lot is occupied or vacant. There is no limitation on the length of assessable reverse frontage.

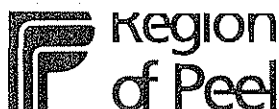
The local improvement process requires a proponent from the community for the noise wall petition. The Region prepares the petition and the proponent circulates within the community to determine the public interest in the proposal. The Region is a neutral party in the petition process. The petition has a time limit and must be returned on or before the closing date. The local improvement petition identifies the benefiting property owner's name, legal property description, and estimated cost share of each benefiting property for the improvement. The property owner(s) signature represents their understanding and acceptance of the conditions stated on the petition and therefore would be considered in the favour of the project.

The Office of the Regional Clerk verifies the petition for sufficiency. A sufficient petition requires at least two-thirds of the benefiting property owners, representing at least one-half of the assessed property value, to sign in favour of the works. Furthermore, there must be signatures representing a majority of the owners for each benefiting property (i.e., greater than one half) in order for it to be counted in favour of the works. The construction of the proposed project depends upon the final approval of Council.

The final cost of a noise wall ultimately depends on the height and type of material selected. Region staff will determine a price based on the approved wall type when the project has been tendered and will provide a breakdown of cost per affected property to the proponent and affected properties.

The *Municipal Act* gives Regional Council authority to set a by-law for collecting the owners' share of the project cost. The Region assesses the exact cost borne by each owner for the proposed works as per the *Municipal Act* and Regional 50/50 cost share policy.

Property owners may pay their share of the project cost through property taxes over fifteen years with imputed interest, or in a lump sum payment upon completion of the works.



Corporate
Policy

Policy No: W30-04
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Effective Date: June 13, 1996

TAB: WORKS
SECTION: ROADS
SUBJECT: NOISE ATTENUATION BARRIERS

General

1. (1) Noise walls abutting railways and freeways under Ministry of Transportation (MTO) jurisdiction shall be constructed using only precast concrete or brick, concrete block or approved composite materials.

(2) Local improvements or retrofit noise walls abutting arterial and collector roads shall be constructed of either masonry, wood or approved composite materials with due consideration to streetscape, and future maintenance requirements at the discretion of the municipality.

(3) Noise walls built on private property abutting arterial and collector roads as a condition of development shall be constructed of either wood or approved composite materials.

(4) Only existing residential sites with reversed frontage and experiencing a daytime noise level equivalent (leq. daytime from 7:00 a.m. to 11:00 p.m.) or 60dBA or higher shall be considered for retrofit noise attenuation barriers.

(5) Retrofit noise walls shall be constructed with the centreline a minimum of 300mm on the public side of the streetline and only where rear yards or side yards abut a municipal road.

(6) Noise walls constructed as a condition of development shall be constructed with the centreline a minimum of 300mm on the private side of the streetline and become the maintenance responsibility of the homeowner through appropriate clauses registered on the title of the lot.

(7) A petition must be signed by owners representing a minimum of 2/3 of the properties in the benefitting area representing a minimum of 50% of the assessed value in order to be considered for a retrofit noise wall under the *Local Improvement Act*.

(8) The resident's special assessment for local improvement noise walls shall be based on 50% of actual final project costs with the remaining 50% to be paid by the municipality.

Guidelines for Installation

2. The following guidelines are to initiate special assessment rolls for charges to be levied as a result of noise barrier construction under the *Local Improvement Act*. This policy is intended to supplement, and not replace, the Noise Barrier Policy, as adopted by Council in April, 1983 under Resolution 83-173-5.

1. In general, projects will be initiated by rate-payers submitting petitions to Regional staff. In cases where the work is considered to be essential, Council may be approached to initiate same. Projects may also be advanced for Council initiative in cases where works should be coordinated with road projects.



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2. The Region will participate only in noise barriers designed in accordance with current technology to give a minimum anticipated noise attenuation of 5 dBA.
3. Wall height generally will be determined as per the sketch approved by Regional Council.
4. In order to achieve the required minimum attenuation the barrier wall should meet or intercept the line of sight between the assumed locations of noise source and receiver.
5. Also the Region will participate only if the road in question is at least four (4) lanes wide and the residential reverse frontage is continuous between intersecting streets. If, as can be the case, the corner lot has direct frontage on the Region road the wall may be terminated with a return, if feasible, along the side lot line prior to the frontage of the corner lot.
6. Mid-block pedestrian right-of-ways may be accommodated by staggering the noise barrier as shown in the sketch approved by Regional Council.
7. The approval of the local Municipality, as to the height and type of wall proposed, will be mandatory, prior to construction, bearing in mind the general aesthetics and the probable contravention of local by-laws, regarding the permissible height of fence.
8. Assessments will be prepared on Special Assessment Rolls on a form to be approved by the Commissioner of Public Works.
9. The total chargeable cost will be the construction cost, i.e. final contract cost including pre-engineering, design, supervision, administration but excluding future maintenance for the total length of the wall including end returns.
10. The portion of the total chargeable cost to be paid by each owner will be based on a modified frontage measurement, (to the nearest one hundredth of a metre) which will be the property width at mid lot in order to compensate for inequities arising from irregularly shaped lots.
11. The homeowner will be assessed 50% of the cost of the barrier under the *Local Improvement Act* with the remaining 50% being paid by the Municipality.

Local Improvement Procedures

3. The following procedure for the construction and maintenance of noise abatement works on petition under the *Local Improvement Act* is adopted:

1. Petition signed by at least two-thirds of owners representing at least one-half of the lots liable to be specially assessed. (Section 11)

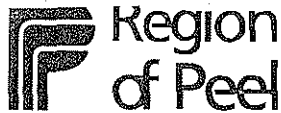


Corporate
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2. Petition lodged with the Clerk and is deemed to be presented to the Council when lodged. (Section 16)
3. Clerk determines sufficiency of petition and endorses certificate to that effect (attached to petition). (Section 15)
4. By-law authorizing engineer's report. (May be general or specific and combined with step 11.) (Section 42)
5. Council receives engineer's report outlining lifetime of the work, reductions for special lot frontages, estimate of the cost of work, statement of the share or proportion of the cost to be borne by the land and by the municipal corporation respectively and the number of instalments by which the special assessment should be made payable. (Section 40)
6. By-law is passed for undertaking the work as a local improvement. (Section 7)
7. By-law is passed with a minimum vote of three-quarters of all members of council (17) assuming a portion of the cost of the works to be paid by the municipal corporation. (May be combined with by-law authorizing the undertaking under Section 7, step 6.) (Section 27)
8. By-law passed authorizing temporary loans or advances to meet the cost of the work pending completion of it. (May be combined with previous steps 6 and 7.) (Section 53(1))
9. By-law awards tender for the construction of the work and firm contract is entered into whereby the cost of completing the undertaking is established and construction of the work has commenced.
10. By-law authorizing borrowing on credit of corporation to repay temporary loans and to defray the cost of the work and issuing debentures if required. Can only be passed after firm contract for carrying out work has been entered into whereby the cost of completing the undertaking is established and construction has commenced. (May also impose special or general rate for repayment of municipal portion of debenture.) (Sections 53(2) to 57)
11. By-law authorizing preparation of the special assessment roll. (May be general or specific and combined with step 4.) (Section 42)
12. By-law establishing Court of Revision. (May be combined with step 4.) (Section 43)
13. Special assessment roll is prepared and kept open for inspection at the Office of the Clerk for ten days before the day appointed for sittings of the Court of Revision. (Section 45)
14. A statement showing under the appropriate heads the actual cost of the work verified by the Clerk or the Treasurer is delivered to the Chair of the Court of Revision. (May show an



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amount not to exceed 25 per cent of the total estimated cost for unfinished work and outstanding claims for land or injurious affection.) Actual cost includes:

- construction cost
- engineering expenses
- cost of advertising and service of notices
- interest on temporary loans
- compensation for land taken and injuriously affected and expenses incurred in connection with determining compensation
- estimated cost of the issue and sale of debentures and discounts allowed to the purchasers of them (Sections 46, 47, 20)

15. Court of Revision holds hearing and adjudicates upon:

- the actual cost of the work
- names of the owners
- frontage or other measurements
- reduction for irregular lots
- amounts assessed on exempt lots
- the lifetime of the work
- the frontage charge as a rate per metre (Court of Revision cannot alter the proportion of the cost to be borne by special assessment and the municipal corporation respectively) (Section 48)

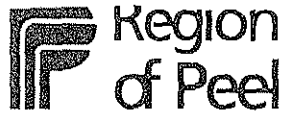
16. Clerk makes correction to special assessment roll and certifies corrected roll. (Section 51)

17. Council or owner may appeal to the Ontario Municipal Board the decision of the Court of Revision within twenty-one days of mailing of decision. (OMB has same powers as Court of Revision.) (Section 52)

18. By-law enacted imposing special assessment payable in annual instalments as Council shall prescribe not to extend beyond the life time of the work. In fixing the amount of annual instalments, a sum sufficient to cover the interest on borrowed funds may be added. Council may also permit commutation of the payment in cash. (Section 65)

19. Each annual instalment becomes due and payable on date defined by by-law under Section 56. Where the payment is not made, the provisions of the *Municipal Act* with respect to penalties and interest on the collection and recovery of taxes apply. (Section 58)

4. Petitioners shall be advised of the estimated cost of the work and their estimated cost share by both notification on the petition form and through a public meeting to be held within one month following verification by the Regional Clerk that the petition meets requirements for sufficiency.



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5. The calculation of frontage lengths for noise abatement works constructed pursuant to the *Local Improvement Act* shall be based on the actual length of wall abutting the property owner's property boundary.

Technical Committee

6. A staff technical committee with members from the Region of Peel, City of Mississauga and City of Brampton appointed by their respective Commissioners shall meet as required with the following mandate:

- (a) to review, update and maintain a harmonized set of noise wall standards and specifications for applications in the Region of Peel, City of Mississauga and City of Brampton;
- (b) to review new products and to maintain and update a list of approved suppliers and products;
- (c) to liaise with suppliers in determining methods of reducing manufacturing costs or improving overall product quality;
- (d) to ensure a consistent application of the *Local Improvement Act* with respect to petition requirements, noise level standards, frontage measurements and special assessment allocation.

SOURCE: Resolutions 88-352-26, 94-55-21, 94-266-12, and 96-598.

**APPENDIX II
LOCAL IMPROVEMENT PROCESS
FOR PRIVATELY OWNED NOISE
ATTENUATION WALLS ALONG REGIONAL ROADS**

NOISE ATTENUATION WALL RATING SYSTEM

Table 1 summarizes the rating mythology and performance rating criteria used by and developed by staff.

Table 1

Component Item	Peel Performance Rating			
	EXCELLENT	GOOD	FAIR	POOR
Concrete Walls	no observed defects	<ul style="list-style-type: none"> light scaling narrow cracks 	<ul style="list-style-type: none"> medium scaling rust stains medium cracks stable relative displacements of units 	<ul style="list-style-type: none"> severe scaling or disintegration visible corrosion of exposed reinforcing steel wide cracks delamination and spalls failed components
Wood Walls	no observed defects	<ul style="list-style-type: none"> light weathering, checks, splits and shakes light rot or decay light abrasion and wear 	<ul style="list-style-type: none"> medium weathering, checks, splits and shakes medium abrasion and wear medium cracking, 	<ul style="list-style-type: none"> severe weathering, checks, splits and shakes severe rot or decay severe cracking, splintering, crushing and shattering severe connection deficiencies failed or missing components
Posts concrete	few cracks < 2mm wide	<ul style="list-style-type: none"> several cracks < 2 mm wide 	<ul style="list-style-type: none"> few cracks > 2 mm wide 	<ul style="list-style-type: none"> cracks with spalls or rust stains; failed post
Posts steel	no observed defects	<ul style="list-style-type: none"> light corrosion – no section loss 	<ul style="list-style-type: none"> medium corrosion – up to 10% section loss 	<ul style="list-style-type: none"> severe corrosion – more than 10% section loss cracked or broken posts
Footings / Foundations	no observed defects	<ul style="list-style-type: none"> narrow cracks 	<ul style="list-style-type: none"> medium cracks minor settlement (< 25 mm) 	<ul style="list-style-type: none"> wide cracks settlement > 25 mm severe erosion of ground around footing
Plumbness	wall is plumb	<ul style="list-style-type: none"> wall out of plumb by less than 1 horizontal to 25 vertical 	<ul style="list-style-type: none"> wall out of plumb by more than 1 horizontal to 25 vertical 	<ul style="list-style-type: none"> wall out of plumb by more than 1 horizontal to 25 vertical with failed connections to panels

**APPENDIX II
LOCAL IMPROVEMENT PROCESS
FOR PRIVATELY OWNED NOISE
ATTENUATION WALLS ALONG REGIONAL ROADS**

The methodology for completing the condition assessment is based on a panel by panel assessment. This produces a condition rating for each post, panel and foundation that rolls-up into an overall rating for the wall based on the sum of its components. An example of the condition rating categories is depicted below in Table 12 with some general comments.

Table 2: Rating System

<i>Rating</i>	<i>Description</i>
<i>Excellent</i>	<ul style="list-style-type: none"> generally constructed within the last 10 years
<i>Good</i>	<ul style="list-style-type: none"> generally constructed within the last 10-20 years
<i>Fair</i>	<ul style="list-style-type: none"> generally constructed 20-30 years; may be of wooden material
<i>Poor</i>	<ul style="list-style-type: none"> generally constructed over 25 to 35 plus years and probably wood.

13.1-26



10 years Private Noise Wall Replacement Plan (2016-2025)

- Mississauga Locations
- Brampton Locations
- Caledon Locations

Subject to Program Approval

BRAMPTON

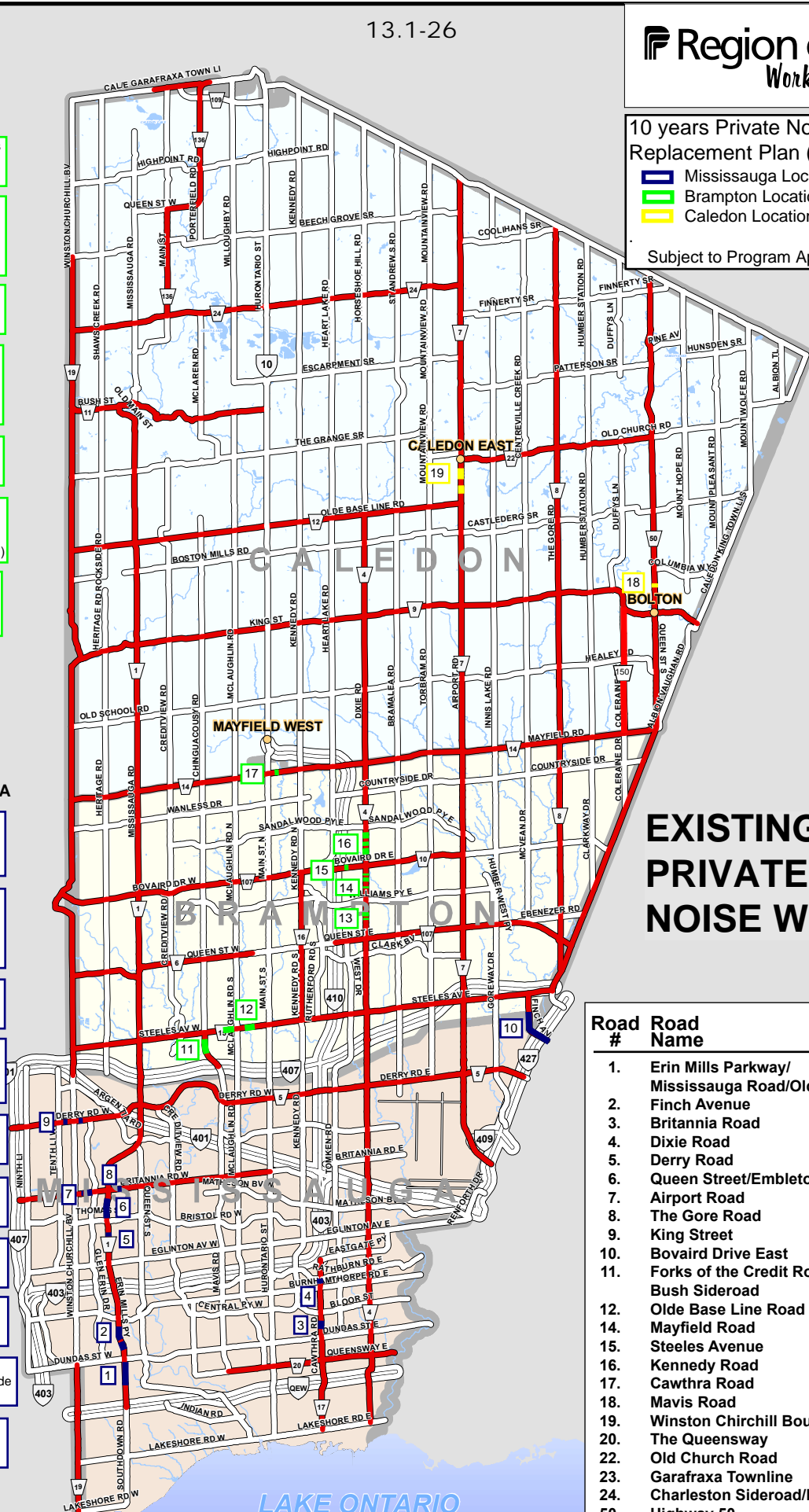
- 11. Abutting Mavis (Ray Lawson to Steeles)
- 12. Abutting Steeles (Windmill to College Plaza, McMurphy Ave. to Sheldrake Ct.)
- 13. Abutting Dixie (Crescent Hill to Williams Pkwy.)
- 14. Abutting Dixie (Mansion St. to North Park Dr., North Park to Bovaird Dr.)
- 15. Abutting Bovaird Dr. (Hwy 410 to Dixie)
- 16. Abutting Dixie (Peter Robertson Blvd. to Sandalwood Pkwy.)
- 17. Abutting Mayfield (Inder Heights to Hurontario)

MISSISSAUGA

- 1. Abutting Erin Mills (Sheridan Park Dr. to Dundas St.)
- 2. Abutting Erin Mills (Dundas to South Millway, Millway to College Way)
- 3. Abutting Cawthra (Silver Creek to Bloor)
- 4. Abutting Cawthra (Burnamthorpe to Rathburn)
- 5. Abutting Erin Mills (Banfield Rd to Thomas St.)
- 6. Abutting Erin Mills (Thomas St. to Vista Blvd.)
- 7. Abutting Britannia (Glen Erin to WCB)
- 8. Abutting Britannia (EMP to Queen St.)
- 9. Abutting Derry (Danton Promenade to WCB)
- 10. Abutting Finch Ave. (Hwy 427 to S. of Darcel Rd.)

CALEDON

- 18. Abutting Hwy 50 (NW of Centennial Dr.)
- 19. Abutting Airport Road (from Cranston to Old Baseline Rd.)



EXISTING PRIVATE NOISE WALLS

Road #	Road Name
1.	Erin Mills Parkway/ Mississauga Road/Old Main Street
2.	Finch Avenue
3.	Britannia Road
4.	Dixie Road
5.	Derry Road
6.	Queen Street/Embleton Road
7.	Airport Road
8.	The Gore Road
9.	King Street
10.	Bovaird Drive East
11.	Forks of the Credit Road/ Bush Sideroad
12.	Olde Base Line Road
14.	Mayfield Road
15.	Steeles Avenue
16.	Kennedy Road
17.	Cawthra Road
18.	Mavis Road
19.	Winston Churchill Boulevard
20.	The Queensway
22.	Old Church Road
23.	Garafraxa Townline
24.	Charleston Sideroad/Highway 24
50.	Highway 50
107.	Queen Street East/Bovaird Drive West
136.	Main Street/Queen Street East/ Porterfield Road
150.	Coleraine Drive

- The projects have yet to be prioritized.
- Some projects (i.e. 13-16) will be included in future road widening projects and therefore qualify for funding from Development Charges.

CATEGORY: WORKS

SUBCATEGORY: ROADS

SUBJECT: PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY

A. PURPOSE

On September 10, 2015, under Resolution 2015-663, Regional Council endorsed a program to rebuild and relocate private noise attenuation walls adjacent to Regional roads on the property line bounding the Regional Road. This program was approved to be funded in full by the Region of Peel.

The policy provides a fair and consistent approach for the conversion of existing noise attenuation walls on private property and adjacent to Regional Roads to be rebuilt and reconstructed onto the property line abutting Regional Property.

Based on asset management best practices, including regularly assessing the condition of the private noise attenuation walls, the conversion program will span over an estimated timeframe of 30 years. This program provides for a timely and justifiable approach to determining the priority of work while providing fairness to residents and providing the Region with the ability to reconstruct over a reasonable timeframe. As well, planning for the use of taxpayer funded reserves to fund the conversion program to maintain long term financial sustainability will be achieved.

B. SCOPE

This policy applies to existing noise attenuation walls on private property with reverse frontage adjacent to Regional Roads (a rear or side lot), existing as of September 10, 2015, representing Regional Council's resolution endorsing the conversion program.

C. DEFINITIONS

1. "Noise Attenuation Wall" means a continuous, solid concrete or wooden structure to lower sound levels.
2. "Regional Noise Attenuation Wall" means a noise attenuation wall built on the property line abutting Regional Property.
3. "Private Noise Attenuation Wall" means an existing noise attenuation wall on private property with rear yards or side yards abutting a Regional road. The Region will participate only in noise attenuation walls designed in accordance with current technology to give a minimum anticipated noise attenuation of 5 decibels.

CATEGORY:	WORKS
SUBCATEGORY:	ROADS
SUBJECT:	PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY

4. "Permission to Enter" means formal permission that must be obtained from the resident before entering a property.
5. "Conversion" means the reconstruction and relocation of existing private noise attenuation walls onto the property line abutting Regional Property.

D. POLICY

Noise attenuation walls in existence as of Regional Council's endorsement of the noise wall conversion program, being September 10, 2015 that are currently located on private property adjacent to Regional Roads will be rebuilt and relocated onto the property line abutting Regional Property. The cost of the replacement of the walls including design, construction and maintenance will be funded in full by the Region of Peel.

1. GENERAL

- a) The replacement of private noise attenuation walls will be determined based on priority – primarily according to the level of deterioration of the walls. For more details, refer to the Prioritization Criteria section on page four (4).
- b) The construction costs to convert the private noise attenuation walls to Regional noise attenuation walls will be one hundred per cent (100%) funded by the Region through a tax-supported capital replacement reserve. Ongoing maintenance and any future replacements of the noise attenuation walls will be the responsibility of the Region.
- c) Until the Region reconstructs the private noise attenuation walls which will be situated, whenever possible, on the property line, the repair of deteriorating noise attenuation walls on private property will remain the sole responsibility of the property owner. The Region of Peel is not responsible for any kind of liability, suit, claim, demand or proceeding of any kind or for any damage incurred or injury suffered by any individual or property owner as a result of the private noise attenuation wall. The Property Standards By-law for each local municipality, Brampton, Mississauga, and Caledon, establishes the requirements of property owners with respect to the maintenance of their property.

CATEGORY: WORKS

SUBCATEGORY: ROADS

SUBJECT: PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY

Each local municipality will ensure that noise attenuation barriers situated on private property are maintained to an acceptable level through enforcement of the Property Standards By-law.

- d) In situations where there is a capital works project planned to widen a Regional Road and construct Regional noise attenuation walls, any affected private noise attenuation walls will be removed as part of the capital works regardless of the condition of the walls.
- e) To initiate start-up of the conversion program, a full inventory of private noise attenuation walls will be gathered followed by detailed condition assessments. This information will be used in combination with the Prioritization Criteria, in order to establish the priority in which the private noise attenuation walls will be converted.
- f) While efforts will be made to meet the related project timelines for inventory collection, condition assessment and construction, the Region makes no representation that the private noise attenuation walls will be converted in any given timeframe.
- g) Generally, the noise attenuation wall conversion undertaken by the Region will be to replace entire blocks where condition warrants replacement.

2. INVENTORY COLLECTION

- a) Prior to undertaking condition assessment and prioritization of conversion construction projects, a comprehensive inventory of all private noise attenuation walls on properties that abut or side Regional Roads will be undertaken to collect the spatial data for all private noise attenuation walls within the Region of Peel.
- b) Following the initial inventory collection and confirmation, at least once every ten years a review of all the private noise attenuation walls within Region of Peel will be undertaken for ongoing verification of inventory accuracy.

3. CONDITION ASSESSMENT

- a) Noise attenuation walls condition assessment is important to order to identify defects and deterioration, identify the functional ability to deliver the service and prioritize the replacement of private noise attenuation walls.

CATEGORY: WORKS

SUBCATEGORY: ROADS

SUBJECT: PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY

- b) The condition rating program for private noise attenuation walls involves site inspection of each private noise attenuation wall following an inspection process with standard criteria to identify defects and to determine an overall rating on each noise attenuation wall based on a review of the panels, foundations and posts.
- c) Conditions are rated using a visual performance rating of the components of Poor, Fair, Good and Excellent.
- d) Upon completion of the initial inventory collection, a detailed visual condition assessment will be undertaken. Going forward, on a regular basis, there will be a visual condition assessment inspection for the inventoried private noise attenuation walls. The inventory collection and inspection work will be undertaken internally.

4. PRIORITIZATION CRITERIA

- a) Several criteria have been established to assist in prioritizing the conversion of private walls. Criteria to determine and prioritize locations include:
 - 1. Public safety and urgency of replacement of observable distresses;
 - 2. Structural integrity and performance of private noise attenuation walls;
 - 3. The estimated service life and level of deterioration; and
 - 4. Consistency in the materials and aesthetics of private noise attenuation walls.
- b) Condition of the noise attenuation walls, public safety, estimated service life and level of deterioration will carry a higher weighting as these are most predominate and quantifiable measures.

5. PRIORITIZATION MODEL

- a) The data gathered for each of the Prioritization Criteria will be assessed to establish the priority of converting the private noise attenuation walls inventory to Regional noise attenuation walls.
- b) Based on the prioritization criteria, a priority listing of all private noise attenuation walls will be developed. Prioritization will be reviewed and updated based on updated condition assessment data.

CATEGORY: WORKS

SUBCATEGORY: ROADS

SUBJECT: PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY

- c) The model will prioritize noise attenuation walls into four categories: Excellent, Good, Fair and Poor. Private noise attenuation walls will be scheduled for replacement based on the wall nearing the end of its useful life – progressing to the poor and/or fair categories. An assessment by the Region of Peel or the related results of the assessment is not an assumption of risk of the condition of the wall, and the risk and liability remains solely with the property owner until the Conversion is completed.

6. LONG TERM FINANCIAL SUSTAINABILITY CONSIDERATIONS

- a) A typical construction of a noise attenuation wall is anticipated to span over the course of two (2) years.
- b) During the first year, a detailed design will commence that will take into consideration the most current Regional road noise attenuation wall design standards. Reasonable notice will be provided by the Region of Peel to all affected property owners prior to the year in which a design for converting a private noise attenuation wall is planned to commence.
- c) The Region of Peel will consult with affected property owners during the detailed design phase and permission to enter will be requested.
- d) Wherever possible, the private noise attenuation wall will be relocated on the property line. Where exceptions due to the nature of the design are required, such as land availability, the wall may be reconstructed on private property and the Region will secure adequate property rights, if necessary.
- e) The location of the noise attenuation wall and related land requirements will be identified during detailed design. The timing of physical construction will be dependent upon securing the relevant property rights, as required, and the permission to enter onto private lands.
- f) During the second year, construction will be undertaken based upon the approved detailed design for the noise attenuation wall. The approval of the local Municipality, as to the height and type of wall proposed, will be required prior to construction.
- g) Noise attenuation walls abutting Regional Property shall be constructed of either masonry, wood or approved composite materials with due consideration to streetscape, and future maintenance requirements at the discretion of the Region of Peel.

CATEGORY: WORKS

SUBCATEGORY: ROADS

SUBJECT: PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY

7. COMMUNICATION PLAN

- a) Ongoing communication throughout the program will be undertaken to ensure updates on inventory, prioritization, and upcoming design and construction work are readily available to keep the public, Regional Councillors, and Region of Peel staff up to date.
- b) Communication will include, but not limited to: regular updating of the Region's external website to provide information on the conversion program; providing written notice to affected property owners of upcoming capital works (design and construction); consulting with affected property owners throughout the capital work; and regularly advising Regional Councillors of the status of inventory collection, prioritization, and construction.

E. GUIDELINES

1. Region of Peel, Standard Specification for Concrete Noise Barrier Walls
2. City of Mississauga, Corporate Policy and Procedure for Noise Attenuation Barriers on Major Roadways
3. Peel, Mississauga, Brampton - Harmonization of Noise Wall Standards and Specifications
4. Region of Peel, Corporate Policy for Asset Management, F10-06
5. Region of Peel Website for Roads Serviced by the Region of Peel

APPROVAL SOURCE:	Council Resolution 2015-663
ORIGINAL DATE:	September 10, 2015
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EFFECTIVE DATE:	October 13, 2016
RESPONSIBILITY:	Public Works, Transportation



**GENERAL GUIDELINES FOR THE
PREPARATION OF ACOUSTICAL REPORTS IN
THE REGION OF PEEL**

November 2012

GENERAL GUIDELINES FOR THE PREPARATION OF ACOUSTICAL REPORTS IN THE REGION OF PEEL

- 1.0 The Ministry of the Environment discontinued its review and clearance functions relating to acoustical reports of Regional and local roads within Peel in 1987 and this function has been delegated directly to the Region of Peel and to the pertinent Area Municipality.

In 1996, the Ministry of the Environment further discontinued its review and clearance functions concerning acoustical reports relating to provincial highways, railways, aircraft and major industrial noise sources, and also delegated this responsibility to the Region of Peel and the pertinent Area Municipality.

The Region of Peel and its constituent Area Municipalities require the applicants of all residential plans of subdivision, rezoning and site plans adjacent to major noise sources in the Region to engage the services of a qualified acoustical specialist (hereafter referred to as the Acoustical consultant) to prepare an acoustical report to be signed and submitted by a professional engineer which will recommend noise control measures to meet the sound level objectives of the Region of Peel, the Area Municipality and the Ministry of the Environment.

- 1.2 Generally, an acoustical report for a plan of subdivision is required only prior to final approval of the plan to clear the conditions of draft approval. However, when it is anticipated that projected noise levels between 7 am and 11 pm will exceed 65 dBA, an acoustical feasibility report will be required prior to draft approval to determine whether the design proposed and layout of the lots will allow the required sound level objectives to be achieved.
- 1.3 Notwithstanding policy 1.2 above, an acoustical feasibility report will be required prior to draft approval for any residential subdivision plan abutting a Provincial or Regional road except in cases where a master acoustical feasibility study has been approved for the area.
- 1.4 The acoustical report must describe the plan of subdivision or the site and its relationship to the major roads and all other major noise sources including industrial, aircraft and rail noise, which may affect future occupants of the subdivision. The report must also identify all future noise sources in consultation with the area municipality and the Region of Peel.
- 1.5 Aircraft and freeway noise shall be considered in accordance with Regional and Municipal Official Plan Policies and the Ministry of Municipal Affairs and Housing's aircraft and freeway noise guidelines.

- 1.6 All other noise sources including industrial activity shall be considered in accordance with the Ministry of Environment criteria and procedures.
- 1.7 The report shall give details of prediction techniques used to determine noise levels (road, rail, aircraft) including all adjustments.

2.0 NOISE PREDICTION AND DESIGN CRITERIA

2.1 Sound Level Limits

2.1.1 The road traffic noise study will be based on the following criteria for sound level limits adopted by the Region of Peel, its constituent municipalities, and the Ministry of the Environment.

2.1.2 Outdoor Living Area
(7am-11pm) Leq (16 hr) = 55dBA

2.1.3 Outside Bedroom Window
(11pm-7am) Leq (8 hr) = 50 dBA

2.1.4 Indoor (bedrooms, hospitals)
(11pm-7am) Leq (8 hr) =40 dBA

2.1.5 Indoor (living rooms, hotels, private offices, reading rooms)
(7am-11pm) Leq (16 hr) =45 dBA

2.1.6 Indoor (general offices, shops)
(7am-11pm) Leq (16 hr) =50 dBA

2.2 Traffic Noise Predictions

2.2.1 With respect to road traffic predictions, only analytical techniques of current methods as approved by the Ministry of the Environment are accepted.

2.2.2 Traffic Volumes on arterial roads in the Urban Area (used in predicting noise level calculations) must be based on ultimate lane configuration and posted speed limit with level of service "D" unless otherwise directed, as set out in the table below:

Lanes	Future Traffic Volume	Medium Truck %	Heavy Truck %
2	16,200	Truck percentages are determined from actual counts, where available.	
4	32,400		
6	48,100		

- 2.2.3. Requests for traffic data must be provided to the Region of Peel in writing.
- 2.2.4. All traffic data sources must be identified in the report.
- 2.2.5. Predicted noise level calculations must be included in the report for both daytime (7am-11pm) and night time (11pm-7am) periods.
- 2.2.6. If manual calculations are used, the report must contain the fully completed MOE Traffic Noise Prediction Work Sheet for all sections calculated. If an acceptable computer model is utilized, sample copies of all sections calculated must be included.
- 2.2.7. The report must detail information on all adjustments, where applicable.
- 2.2.8. Where there is more than one source impacting the site, the calculations for each source and the combined noise level calculations must be included.
- 2.2.9. For industrial, aircraft and rail sound predictions, the Ministry of the Environment standard procedures should be employed with the report detailing the method of calculation or measurement.

2.3 Noise Barrier Calculations

- 2.3.1 In addition to noise level calculations, acoustical barrier calculations must also be included in the report and accompanied by a table of comparative barrier heights and barrier cross section drawings, which must comply with the following criteria:
 - a) The comparative barrier heights table must demonstrate attenuation under alternative heights including the sound level objective and the report's recommended level
 - b) Typical and/or worst case cross sections (and additional cross sections as may be necessary) at a vertical and horizontal scale of 1 to 1000 must be provided to clearly illustrate the proposed berm and wall configuration in relation to the future grade at the house based on the proposed Lot Grading Plan. (Existing and proposed future grades at the site must be indicated).

- c) Height of receiver to be used is 1.5 metres above the ground at a point located 3.0 metres from the rear wall of the dwelling unit.
- d) Barrier wall (i.e., fence) shall generally not exceed 2.0 metres in height unless approved by the area municipality in consultation with the appropriate road authority. Consideration may be given to fence heights up to a maximum of 2.4 metres.
- e) A minimum of 6.0 metres depth of rear yard as measured from rear face of the building which contains no slope in excess of 2% will be required by the Region of Peel unless otherwise specified as follows:
 - a. In Brampton, any sloped portion in excess of 2% shall not occupy more than 1/3 of the overall depth of the rear yard.
- f) A maximum berm slope of 4:1 on the right of way side will be required on all local and Regional roads within the Region of Peel unless otherwise specified below. Slopes steeper than 3:1 may be tolerated on the lot side of the earthwork (berm) by the use of retaining walls, etc provided that the Area Municipality is satisfied from a drainage and landscaping standpoint. Back to front drainage should be provided for wherever possible.
 - a. In Mississauga, 3:1 berm slopes on the street side will be permitted.
 - b. In Brampton, 3:1 berm slopes on the street side will be permitted as an option if the developer agrees to full planting with low maintenance cover.
- g) In cases where the attenuation facility is interrupted, barrier returns or parallel screens are required and the detailed design of the treatment in cases will have to be incorporated into the acoustical report.
- h) Barrier walls should generally be located no further than 0.3 metres from the rear lot line or as specified by the Area Municipality. Barrier walls will be located on the private homeowner's side of the lot line.
- i) Boulevard slopes (between berms and the edge of the pavement) will preferably be 2%-4%.
- j) The combined height of berm and barrier over 4 metres will be considered in very exceptional situations. 4 metre barrier height will generally be calculated (in standard situations) from the centre line of the pavement. In non-standard or extreme the barrier heights will be considered on an individual basis. The area municipality shall be consulted on local height restrictions. (The maximum barrier height is generally to be measured from a line joining the centre line of the pavement to the ground level at the rear of the dwelling unit, except in non-standard situations.)

2.3.2. Information on acoustical barriers, berms, berm/wall combinations must include location and height of barriers relative to a fixed point, usually the centreline of the road. Unless otherwise agreed to, no portion of a berm may extend onto a municipal road right of way.

- 2.3.3. Type and surface density (minimum of 4lbs/sqft) of barrier fence should be specified.
- 2.3.4. The report shall be required to prove to the satisfaction of the Region of Peel, the Area Municipality and the Ministry of the Environment that the noise level in outdoor living areas after applying attenuation measures is the lowest level aesthetically, technically, administratively practical. To this end, the reports shall continue to provide a table of comparative barrier heights and show the height required to attenuate sounds to the Ministry of the Environment standards. The sound level objective is 55 dBA.

The report must show that the analysis has been done to meet the planning objectives of the municipality and that every effort has been made to achieve the 55 dBA sound level at a minimum, line of sight from receiver to source must be broken in all cases.

The report will provide an explanation in circumstances where the recommended barrier heights and other attenuation measures will result in the Ministry of Environment guidelines not being met.

(Note: It is preferable, that where possible, residential developments be designed such that the need for barrier type attenuation features, to control outdoor noise levels, is minimized.)

2.4 Other Noise Control Measures for Outdoor Living Areas

- 2.4.1 Alternative measures (site planning, service road, special type or location of acoustical barriers, etc) should be discussed with the Region and the Areas municipality in advance to receive their acceptance in principle.
- 2.4.2 Front yard attenuation (i.e., outdoor living areas in the front yard) area not an acceptable form of noise attenuation for reversed frontage lots.

2.5 Noise Attenuation for Indoor Living Areas

- 2.5.1 Central air conditioning is required when the night time noise level is 60 dBA or greater at a bedroom window or when the day time noise level exceeds 65 dBA at the exterior face of a living room. A warning clause note to this effect is to be included in the reports and in the Subdivision Agreement for registration on title.
- 2.5.2 For central air conditions requirements, traffic volumes may be based on a 10 year projection from the estimated date of occupancy of the affected dwellings.

- 2.5.3 If central air conditioning is required, a noise insensitive location or other appropriate means of noise attenuation of the air collected condenser unit should be stipulated in the report and specified in the Subdivision Agreement. If a heat pump is installed, the location of the outdoor unit should be specified as well. In all cases the condenser unit should have a maximum ARI rating of 7.6 Bels for 3.5 tons or less.
- 2.5.4 If the night time outdoor noise level is above 50 dBA and below 60 dBA forced air heating is to be installed with provision for central air conditioning. A warning clause note to this effect is to be included in the report and in the Subdivision Agreement for registration on title. (See wording in 2.6).
- 2.5.5 When the night time outdoor noise level at the bedroom window is 60 dBA or greater, door specifications, outer wall specifications and required window glazing shall be provided. All recommendations shall be based on ultimate traffic volumes and the report shall distinguish between those dwellings where the standard requirements of the Ontario building Code will provide adequate indoor attenuation and those locations where additional measures are required.
- 2.5.6 Noise reports will not be required for industrial/commercial/office developments. In lieu of requiring a noise report the following building component requirements will be imposed as a condition to development:

“Prior to the issuance of building permits for Blocks (___), an acoustical consultant shall certify on the building plans submitted for application approval to the Building Department that the building design for the office and retail areas include double glaze noon-opening windows, brick veneer or its acoustical equivalent, and air conditioning system and a suspended acoustical type ceiling.

2.6 Warning Clauses

- 2.6.1 The following minimum wording is to be used in the Subdivision Agreement and in all Offers of Purchase and Sale for the specific lots when noise levels are not being attenuated and the levels exceed the Municipality’s and the Ministry of the Environment’s noise criteria, but not by more than 5 dBA:

“Purchasers are advised that noise levels due to increasing road (rail) (air) traffic may continue to be of concern, occasionally interfering with some activities of the dwelling occupants.”

- 2.6.2 When noise attenuation measures have been instituted on the site, and resultant noise levels still exceed the Municipality’s and the Ministry of Environment’s noise criteria by 5 dBA or less, the

following wording is to be used in the Subdivision Agreement and in all Offers of Purchase and Sale for the specific lots:

“Purchasers are advised that despite the inclusion of noise control features in this development area and within the building units, noise levels from increasing road (rail) (air) traffic may continue to be of concern, occasionally interfering with some activities of the dwelling occupants as the noise level exceeds the Municipality’s and the Ministry of the Environment’s noise criteria.”

2.6.3 If the Municipality accepts a noise attenuation solution where the resultant noise level exceeds the Municipality’s and the Ministry of Environment’s criteria by more than 5dBA, the warning clause in paragraphs 2.6.1 and 2.6.2 must be reworded by replacing the word “may” with “will” or as directed by the Area Municipality.

2.6.4 When forced air heating with provision for central air conditioning is to be installed the following additional paragraph is to be added to the warning clause in 2.6.2:

“This dwelling unit was fitted with a forced air heating system and the ducting, etc sized to accommodate a central air conditioning unit. Air conditioning may be installed at the owner’s option and cost.

2.6.5 Where mandatory air conditioning is to be installed, the following additional paragraph is to be added to the warning clause in 2.6.2: “This dwelling unit was fitted with a central air conditioning system in order to permit closing of the windows for noise control, (Note: locate air cooled condenser unit in a noise insensitive area and ensure that unit has a maximum ARI rating of 7.6 Bels for 3.5 tons or less.)”

2.6.6 Where berms and/or barriers are being installed on the site the following additional paragraph is to be added to the warning clause in 2.6.2:

“That the acoustical berm and/or barrier as installed, shall be maintained, repaired or replaced by the owner. Any maintenance, repair or replacement shall be with the same material, or to the same standards, and having the same colour and appearance of the original.”

3.0 REPORT FORMAT AND SUBMISSION REQUIREMENTS

3.1 While the technique or techniques used, the data, calculations, and resulting recommendations are the sole responsibility of the consultant,

it is appropriate that a reasonable standard report format be utilized to minimize processing delay and facilitate the formulation of requirements to be incorporated within the development agreement.

3.1.1 In order to expedite processing and approval, the following format should be used for submission within the Region of Peel:

- a) cover page to clearly identify the Regional and local municipality's file number, the applicant's name and the name of the development if known.
- b) Introduction to identify noise sources and sources of data utilized. This should include a brief description of on site conditions together with analytical techniques used. Listing of criteria for sound level limits would be appropriate as well as alternative methods considered for noise mitigation.
- c) Analysis procedures for on site conditions before barrier to include sample calculations and work sheets for typical and worst case situations. Summary table to include all predicted noise levels with locations identified.
- d) Analysis procedures for on site conditions after barrier to utilize the same typical and worst case situations together with a table of alternative barrier heights. Cross sections of berm barrier configuration to be included for typical and worst case samples.
- e) A table illustrating all recommended attenuation measures including building component specifications to be provided with a sketch illustrating affected lots.
- f) A plan of the affected lots which clearly depicts all information including existing and/or proposed:
 - a. Property boundaries
 - b. Building and/or building envelopes
 - c. Noise walls, berms and sidewalks
 - d. Sample receiver locations with cross sections keyed in
 - e. Other relevant site features

APPENDIX B

Traffic Data

1664714 Albion Vaughan and King Road Noise Impact Study - Prediction Modelling Inputs

Client Data
Assumption

			SPEED	EXISTING DATA							ALIGNMENT ANNUAL GROWTH %	FUTURE DATA WITH PROJECT						
ALIGNMENT		ROAD SEGMENT ID		AADT	YEAR	DAYTIME %	NIGHTTIME %	% TRUCKS (COMMERCIAL)	% MEDIUM TRUCKS	% HEAVY TRUCKS		AADT	YEAR	DAYTIME %	NIGHTTIME %	% TRUCKS (COMMERCIAL)	% MEDIUM TRUCKS	% HEAVY TRUCKS
Albion Vaughan North NB	@ King	S01	60	4012	2017	90%	10%	1.2%	0.4%	0.8%	1.0%	4938	2037	90%	10%	1.2%	0.4%	0.8%
Albion Vaughan North SB	@ King	S02	60	3574	2017	90%	10%	1.1%	0.2%	0.9%	1.3%	4660	2037	90%	10%	1.1%	0.2%	0.9%
Albion Vaughan North SB Left	@ King	S03	60	899	2017	90%	10%	1.7%	0.5%	1.2%	1.3%	1172	2037	90%	10%	1.7%	0.5%	1.2%
Albion Vaughan North SB Right	@ King	S04	60	435	2017	90%	10%	2.4%	1.5%	1.0%	1.3%	567	2037	90%	10%	2.4%	1.5%	1.0%
Albion Vaughan South NB	@ King	S05	60	3538	2017	90%	10%	1.3%	0.5%	0.8%	1.0%	4355	2037	90%	10%	1.3%	0.5%	0.8%
Albion Vaughan South NB Left	@ King	S06	60	923	2017	90%	10%	3.9%	1.9%	2.1%	1.0%	1137	2037	90%	10%	3.9%	1.9%	2.1%
Albion Vaughan South SB	@ King	S07	60	7476	2017	90%	10%	5.2%	0.3%	4.9%	1.6%	10233	2037	90%	10%	5.2%	0.3%	4.9%
King South East EB	@ Albion Vaughan	S08	60	4978	2017	90%	10%	1.4%	0.1%	1.3%	1.1%	6186	2037	90%	10%	1.4%	0.1%	1.3%
King South East WB	@ Albion Vaughan	S09	60	3320	2017	90%	10%	1.4%	0.1%	1.3%	1.8%	4743	2037	90%	10%	1.4%	0.1%	1.3%
King South East WB Left	@ Albion Vaughan	S10	60	3901	2017	90%	10%	8.9%	0.4%	8.5%	1.8%	5574	2037	90%	10%	8.9%	0.4%	8.5%
King South West EB	@ Albion Vaughan	S11	60	4079	2017	90%	10%	1.3%	0.0%	1.3%	1.0%	5014	2037	90%	10%	1.3%	0.0%	1.3%
King South West EB Left	@ Albion Vaughan	S12	60	475	2017	90%	10%	1.1%	0.0%	1.1%	1.0%	583	2037	90%	10%	1.1%	0.0%	1.1%
King South West EB Right	@ Albion Vaughan	S13	60	1641	2017	90%	10%	4.0%	3.1%	0.9%	1.0%	2017	2037	90%	10%	4.0%	3.1%	0.9%
King South West WB	@ Albion Vaughan	S14	60	4243	2017	90%	10%	1.9%	0.4%	1.5%	1.6%	5880	2037	90%	10%	1.9%	0.4%	1.5%
Albion Vaughan North NB RL	@ King	S15	60	859	2017	90%	10%	2.6%	0.0%	2.6%	1.8%	1227	2037	90%	10%	2.6%	0.0%	2.6%
Albion Vaughan South NB Right	@ King	S16	60	3833	2017	90%	10%	8.5%	0.4%	8.1%	1.0%	4718	2037	90%	10%	8.5%	0.4%	8.1%
Albion Vaughan South SB RL	@ King	S17	60	1641	2017	90%	10%	4.0%	3.1%	0.9%	1.0%	2017	2037	90%	10%	4.0%	3.1%	0.9%
King South East EB RL	@ Albion Vaughan	S18	60	3833	2017	90%	10%	8.5%	0.4%	8.1%	1.0%	4718	2037	90%	10%	8.5%	0.4%	8.1%
King South East WB Right	@ Albion Vaughan	S19	60	859	2017	90%	10%	2.6%	0.0%	2.6%	1.8%	1227	2037	90%	10%	2.6%	0.0%	2.6%
King South West WB RL	@ Albion Vaughan	S20	60	435	2017	90%	10%	2.4%	1.5%	1.0%	1.3%	567	2037	90%	10%	2.4%	1.5%	1.0%

Note: Daytime (16 Hours) – 07:00 to 23:00. Nighttime (8 Hours) – 23:00 to 0

APPENDIX C

ORNAMENT Inputs Summary

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	NS Barrier Angle 1 (degrees)	NS Barrier Angle 2 (degrees)	NS Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-79	20	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	231	231	0	0	20	3.0	3	210.0	232.7	232.7	278	98.75%	0.43%	0.81%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	20	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	220	220	0	-70	0	3.0	3	209.8	231.4	231.4	278	98.75%	0.43%	0.81%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	17	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	226	226	0	-80	-60	3.0	3	209.6	229.0	229.0	278	98.75%	0.43%	0.81%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	21	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	203	203	0	-81	-55	3.0	3	209.7	230.2	230.2	278	98.75%	0.43%	0.81%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	33	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	148	148	0	-84	33	0.0	3	210.0	224.0	224.0	278	98.75%	0.43%	0.81%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-83	29	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	161	161	0	-83	-30	3.0	3	210.0	224.6	224.6	278	98.75%	0.43%	0.81%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-82	29	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	175	175	0	-55	29	3.0	3	210.0	226.0	226.0	278	98.75%	0.43%	0.81%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85	41	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	101	101	0	40	41	3.0	3	210.0	218.2	218.2	278	98.75%	0.43%	0.81%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	39	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	95	95	0	-86	39	0.0	3	209.7	218.0	218.0	278	98.75%	0.43%	0.81%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	34	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	70	0	-87	-40	3.0	3	209.6	211.9	211.9	278	98.75%	0.43%	0.81%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	37	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	76	0	-55	37	3.0	3	210.0	212.9	212.9	278	98.75%	0.43%	0.81%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	55	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	58	58	0	0	55	3.0	3	210.0	212.4	212.4	278	98.75%	0.43%	0.81%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	59	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	48	48	0	80	59	0.0	3	209.9	211.5	211.5	278	98.75%	0.43%	0.81%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	75	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	46	46	0	-88	-45	3.0	3	211.0	210.1	210.1	278	98.75%	0.43%	0.81%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	70	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	62	0	-87	50	3.0	3	211.0	209.8	209.8	278	98.75%	0.43%	0.81%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	-2	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	293	293	0	-77	-2	0.0	3	209.9	216.1	216.1	278	98.75%	0.43%	0.81%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	-4	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	303	304	0	-77	-35	3.0	3	209.9	215.2	215.2	278	98.75%	0.43%	0.81%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	-6	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	205	206	0	-81	-6	0.0	3	209.9	213.0	213.0	278	98.75%	0.43%	0.81%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	-8	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	216	218	0	-81	-35	3.0	3	209.9	212.7	212.7	278	98.75%	0.43%	0.81%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	-30	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	84	97	0	-86	-30	0.0	3	209.9	209.5	209.5	278	98.75%	0.43%	0.81%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	-32	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	98	115	0	-86	-40	3.0	3	209.9	209.4	209.4	278	98.75%	0.43%	0.81%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85	-23	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	111	121	0	-50	-23	3.0	3	209.9	209.6	209.6	278	98.75%	0.43%	0.81%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-66	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	22	54	0	-89	-66	0.0	3	209.9	209.2	209.2	278	98.75%	0.43%	0.81%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-55	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	38	67	0	-88	-55	3.0	3	209.9	209.2	209.2	278	98.75%	0.43%	0.81%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-69	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	233	0	-80	-69	3.0	3	209.9	210.3	210.3	278	98.75%	0.43%	0.81%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-67	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	224	0	-30	-67	0.0	3	209.9	209.8	209.8	278	98.75%	0.43%	0.81%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-69	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	61	218	0	60	-69	0.0	3	209.9	209.4	209.4	278	98.75%	0.43%	0.81%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-53	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	85	85	0	0	86	3.0	3	210.3	219.4	219.4	278	98.75%	0.43%	0.81%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-61	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	69	69	0	70	86	3.0	3	210.5	219.1	219.1	278	98.75%	0.43%	0.81%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-64	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	70	0	-64	-45	3.0	3	210.8	219.1	219.1	278	98.75%	0.43%	0.81%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-54	88	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	53	53	0	-54	88	0.0	3	209.7	217.0	217.0	278	98.75%	0.43%	0.81%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-51	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	65	65	0	-51	-20	3.0	3	209.9	217.8	217.8	278	98.75%	0.43%	0.81%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-43	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	76	0	-43	50	3.0	3	209.7	216.9	216.9	278	98.75%	0.43%	0.81%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-9	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	117	117	0	0	85	3.0	3	210.0	216.6	216.6	278	98.75%	0.43%	0.81%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-12	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	103	103	0	50	86	3.0	3	210.0	216.1	216.1	278	98.75%	0.43%	0.81%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-20	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	96	96	0	-20	-70	0.0	3	209.9	216.1	216.1	278	98.75%	0.43%	0.81%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-18	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	174	174	0	-18	-30	0.0	3	209.9	219.0	219.0	278	98.75%	0.43%	0.81%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-13	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	191	191	0	-13	60	3.0	3	209.7	219.6	219.6	278	98.75%	0.43%	0.81%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	NS Barrier Angle 1 (degrees)	NS Barrier Angle 2 (degrees)	NS Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	20	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	224	224	0	0	20	3.0	3	210.0	232.7	232.7	262	98.87%	0.24%	0.89%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	21	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	213	213	0	-70	0	3.0	3	210.0	231.4	231.4	262	98.87%	0.24%	0.89%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	17	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	219	219	0	-80	-60	3.0	3	210.0	229.0	229.0	262	98.87%	0.24%	0.89%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	22	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	197	197	0	-81	-55	3.0	3	210.0	230.2	230.2	262	98.87%	0.24%	0.89%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	34	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	142	142	0	-84	34	0.0	3	210.0	224.0	224.0	262	98.87%	0.24%	0.89%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-83	30	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	154	154	0	-83	-30	3.0	3	210.0	224.6	224.6	262	98.87%	0.24%	0.89%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-83	30	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	168	168	0	-55	30	3.0	3	210.0	226.0	226.0	262	98.87%	0.24%	0.89%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	43	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	94	94	0	40	43	3.0	3	210.0	218.2	218.2	262	98.87%	0.24%	0.89%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	41	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	88	0	-86	41	0.0	3	210.0	218.0	218.0	262	98.87%	0.24%	0.89%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	37	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	63	0	-87	-40	3.0	3	210.0	211.9	211.9	262	98.87%	0.24%	0.89%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	40	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	69	69	0	-55	40	3.0	3	210.0	212.9	212.9	262	98.87%	0.24%	0.89%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	59	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	51	0	0	59	3.0	3	210.0	212.4	212.4	262	98.87%	0.24%	0.89%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	63	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	41	41	0	80	63	0.0	3	210.0	211.5	211.5	262	98.87%	0.24%	0.89%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	74	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	42	0	-90	-45	3.0	3	211.0	210.1	210.1	262	98.87%	0.24%	0.89%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	70	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	58	58	0	-90	50	3.0	3	211.0	209.8	209.8	262	98.87%	0.24%	0.89%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	-2	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	286	286	0	-77	-2	0.0	3	209.9	216.1	216.1	262	98.87%	0.24%	0.89%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	-4	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	296	297	0	-77	-35	3.0	3	209.9	215.2	215.2	262	98.87%	0.24%	0.89%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	-6	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	198	199	0	-81	-6	0.0	3	209.9	213.0	213.0	262	98.87%	0.24%	0.89%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-7	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	210	211	0	-80	-35	3.0	3	209.9	212.7	212.7	262	98.87%	0.24%	0.89%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	-32	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	78	91	0	-86	-32	0.0	3	209.9	209.5	209.5	262	98.87%	0.24%	0.89%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85	-33	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	91	109	0	-85	-40	3.0	3	209.9	209.4	209.4	262	98.87%	0.24%	0.89%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85	-24	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	104	114	0	-50	-24	3.0	3	209.9	209.6	209.6	262	98.87%	0.24%	0.89%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-73	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	15	51	0	-89	-73	0.0	3	209.9	209.2	209.2	262	98.87%	0.24%	0.89%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	-59	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	32	63	0	-87	-59	3.0	3	209.9	209.2	209.2	262	98.87%	0.24%	0.89%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	-71	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	232	0	-81	-71	3.0	3	209.9	210.3	210.3	262	98.87%	0.24%	0.89%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-69	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	65	222	0	-30	-69	0.0	3	209.9	209.8	209.8	262	98.87%	0.24%	0.89%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	-71	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	216	0	60	-71	0.0	3	209.9	209.4	209.4	262	98.87%	0.24%	0.89%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-51	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	91	91	0	0	85	3.0	3	210.0	219.4	219.4	262	98.87%	0.24%	0.89%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-61	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	75	75	0	70	84	3.0	3	210.4	219.1	219.1	262	98.87%	0.24%	0.89%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-64	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	75	75	0	-64	-45	3.0	3	210.7	219.1	219.1	262	98.87%	0.24%	0.89%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-51	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	60	0	-51	87	0.0	3	210.0	217.0	217.0	262	98.87%	0.24%	0.89%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-48	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	72	0	-48	-20	3.0	3	210.0	217.8	217.8	262	98.87%	0.24%	0.89%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-41	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	83	83	0	-41	50	3.0	3	210.0	216.9	216.9	262	98.87%	0.24%	0.89%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-9	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	123	123	0	0	85	3.0	3	210.0	216.6	216.6	262	98.87%	0.24%	0.89%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-11	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	110	110	0	50	85	3.0	3	210.0	216.1	216.1	262	98.87%	0.24%	0.89%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-19	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	103	103	0	-19	-70	0.0	3	210.0	216.1	216.1	262	98.87%	0.24%	0.89%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-17	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	181	181	0	-17	-30	0.0	3	210.0	219.0	219.0	262	98.87%	0.24%	0.89%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-12	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	198	198	0	-12	60	3.0	3	210.0	219.6	219.6	262	98.87%	0.24%	0.89%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	NS Barrier Angle 1 (degrees)	NS Barrier Angle 2 (degrees)	NS Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	20	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	228	228	0	0	20	3.0	3	210.0	232.7	232.7	66	98.35%	0.47%	1.18%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	20	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	216	216	0	-70	0	3.0	3	210.0	231.4	231.4	66	98.35%	0.47%	1.18%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	17	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	222	222	0	-80	-60	3.0	3	209.9	229.0	229.0	66	98.35%	0.47%	1.18%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	21	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	200	200	0	-81	-55	3.0	3	210.0	230.2	230.2	66	98.35%	0.47%	1.18%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	33	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	145	145	0	-84	33	0.0	3	210.0	224.0	224.0	66	98.35%	0.47%	1.18%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-83	29	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	158	158	0	-83	-30	3.0	3	210.0	224.6	224.6	66	98.35%	0.47%	1.18%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-82	29	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	171	171	0	-55	29	3.0	3	210.0	226.0	226.0	66	98.35%	0.47%	1.18%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85	42	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	98	98	0	40	42	3.0	3	210.0	218.2	218.2	66	98.35%	0.47%	1.18%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	40	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	91	91	0	-86	40	0.0	3	210.0	218.0	218.0	66	98.35%	0.47%	1.18%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	35	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	67	67	0	-87	-40	3.0	3	209.8	211.9	211.9	66	98.35%	0.47%	1.18%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	38	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	72	0	-55	38	3.0	3	210.0	212.9	212.9	66	98.35%	0.47%	1.18%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	57	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	55	55	0	0	57	3.0	3	210.0	212.4	212.4	66	98.35%	0.47%	1.18%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	61	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	45	45	0	80	61	0.0	3	210.0	211.5	211.5	66	98.35%	0.47%	1.18%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	43	43	0	-88	-45	3.0	3	211.0	210.1	210.1	66	98.35%	0.47%	1.18%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	72	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	59	0	-87	50	3.0	3	211.0	209.8	209.8	66	98.35%	0.47%	1.18%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	-2	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	290	290	0	-77	-2	0.0	3	209.9	216.1	216.1	66	98.35%	0.47%	1.18%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	-4	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	300	300	0	-77	-35	3.0	3	209.9	215.2	215.2	66	98.35%	0.47%	1.18%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	-6	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	201	202	0	-81	-6	0.0	3	209.9	213.0	213.0	66	98.35%	0.47%	1.18%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-7	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	213	215	0	-80	-35	3.0	3	209.9	212.7	212.7	66	98.35%	0.47%	1.18%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	-31	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	95	0	-86	-31	0.0	3	209.9	209.5	209.5	66	98.35%	0.47%	1.18%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-82	-29	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	95	112	0	-82	-40	3.0	3	209.9	209.4	209.4	66	98.35%	0.47%	1.18%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85	-24	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	108	118	0	-50	-24	3.0	3	209.9	209.6	209.6	66	98.35%	0.47%	1.18%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-69	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	19	53	0	-88	-69	0.0	3	209.9	209.2	209.2	66	98.35%	0.47%	1.18%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	-56	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	36	65	0	-86	-56	3.0	3	209.9	209.2	209.2	66	98.35%	0.47%	1.18%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-70	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	233	0	-80	-70	3.0	3	209.9	210.3	210.3	66	98.35%	0.47%	1.18%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-68	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	224	0	-30	-68	0.0	3	209.9	209.8	209.8	66	98.35%	0.47%	1.18%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	-70	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	61	218	0	60	-70	0.0	3	209.9	209.4	209.4	66	98.35%	0.47%	1.18%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-52	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	88	0	0	85	3.0	3	210.2	219.4	219.4	66	98.35%	0.47%	1.18%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-59	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	73	0	70	86	3.0	3	210.4	219.1	219.1	66	98.35%	0.47%	1.18%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-62	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	73	0	-62	-45	3.0	3	210.7	219.1	219.1	66	98.35%	0.47%	1.18%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-52	88	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	57	57	0	-52	88	0.0	3	210.0	217.0	217.0	66	98.35%	0.47%	1.18%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-49	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	69	69	0	-49	-20	3.0	3	210.0	217.8	217.8	66	98.35%	0.47%	1.18%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-43	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	80	80	0	-43	50	3.0	3	210.0	216.9	216.9	66	98.35%	0.47%	1.18%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-9	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	120	120	0	0	85	3.0	3	210.0	216.6	216.6	66	98.35%	0.47%	1.18%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-11	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	106	106	0	50	85	3.0	3	210.0	216.1	216.1	66	98.35%	0.47%	1.18%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-19	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	100	100	0	-19	-70	0.0	3	210.0	216.1	216.1	66	98.35%	0.47%	1.18%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-17	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	177	177	0	-17	-30	0.0	3	210.0	219.0	219.0	66	98.35%	0.47%	1.18%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-12	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	194	194	0	-12	60	3.0	3	209.9	219.6	219.6	66	98.35%	0.47%	1.18%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	NS Barrier Angle 1 (degrees)	NS Barrier Angle 2 (degrees)	NS Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	18	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	224	224	0	0	18	3.0	3	210.0	232.7	232.7	32	97.56%	1.46%	0.98%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	18	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	213	213	0	-70	0	3.0	3	210.0	231.4	231.4	32	97.56%	1.46%	0.98%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85	11	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	218	218	0	-85	-60	3.0	3	210.0	229.0	229.0	32	97.56%	1.46%	0.98%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-82	19	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	196	196	0	-82	-55	3.0	3	210.0	230.2	230.2	32	97.56%	1.46%	0.98%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	32	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	141	141	0	-84	32	0.0	3	210.0	224.0	224.0	32	97.56%	1.46%	0.98%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	28	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	154	154	0	-84	-30	3.0	3	210.0	224.6	224.6	32	97.56%	1.46%	0.98%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-83	28	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	168	168	0	-55	28	3.0	3	210.0	226.0	226.0	32	97.56%	1.46%	0.98%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	41	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	94	94	0	40	41	3.0	3	210.0	218.2	218.2	32	97.56%	1.46%	0.98%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	39	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	88	0	-87	39	0.0	3	210.0	218.0	218.0	32	97.56%	1.46%	0.98%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	29	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	61	61	0	-90	-40	3.0	3	210.0	211.9	211.9	32	97.56%	1.46%	0.98%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	33	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	68	68	0	-55	33	3.0	3	209.9	212.9	212.9	32	97.56%	1.46%	0.98%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	58	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	51	0	0	58	3.0	3	210.0	212.4	212.4	32	97.56%	1.46%	0.98%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	63	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	41	41	0	80	63	0.0	3	210.0	211.5	211.5	32	97.56%	1.46%	0.98%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	75	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	42	0	-90	-45	3.0	3	211.0	210.1	210.1	32	97.56%	1.46%	0.98%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	70	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	58	58	0	-90	50	3.0	3	211.0	209.8	209.8	32	97.56%	1.46%	0.98%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-74	0	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	281	282	0	-74	0	0.0	3	210.0	216.1	216.1	32	97.56%	1.46%	0.98%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-71	0	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	291	292	0	-71	-35	3.0	3	210.0	215.2	215.2	32	97.56%	1.46%	0.98%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-72	0	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	193	195	0	-72	0	0.0	3	210.0	213.0	213.0	32	97.56%	1.46%	0.98%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-71	-1	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	205	208	0	-71	-35	3.0	3	210.0	212.7	212.7	32	97.56%	1.46%	0.98%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-76	-28	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	75	92	0	-76	-28	0.0	3	210.0	209.5	209.5	32	97.56%	1.46%	0.98%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	-30	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	110	0	-77	-40	3.0	3	210.0	209.4	209.4	32	97.56%	1.46%	0.98%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-76	-21	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	101	114	0	-50	-21	3.0	3	210.0	209.6	209.6	32	97.56%	1.46%	0.98%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85	-76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	12	58	0	-85	-76	0.0	3	210.0	209.2	209.2	32	97.56%	1.46%	0.98%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-59	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	29	68	0	-80	-59	3.0	3	210.0	209.2	209.2	32	97.56%	1.46%	0.98%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-71	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	239	0	-80	-71	3.0	3	210.0	210.3	210.3	32	97.56%	1.46%	0.98%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-79	-70	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	64	229	0	-30	-70	0.0	3	210.0	209.8	209.8	32	97.56%	1.46%	0.98%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-72	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	224	0	60	-72	0.0	3	210.0	209.4	209.4	32	97.56%	1.46%	0.98%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-48	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	91	91	0	0	85	3.0	3	210.0	219.4	219.4	32	97.56%	1.46%	0.98%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-58	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	76	0	70	83	3.0	3	210.4	219.1	219.1	32	97.56%	1.46%	0.98%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-61	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	75	75	0	-61	-45	3.0	3	210.7	219.1	219.1	32	97.56%	1.46%	0.98%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-46	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	60	0	-46	87	0.0	3	210.0	217.0	217.0	32	97.56%	1.46%	0.98%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-44	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	72	0	-44	-20	3.0	3	210.0	217.8	217.8	32	97.56%	1.46%	0.98%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-37	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	83	83	0	-37	50	3.0	3	210.0	216.9	216.9	32	97.56%	1.46%	0.98%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-10	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	127	127	0	0	80	3.0	3	210.0	216.6	216.6	32	97.56%	1.46%	0.98%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-12	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	113	113	0	50	80	3.0	3	210.0	216.1	216.1	32	97.56%	1.46%	0.98%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-19	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	105	105	0	-19	-70	0.0	3	210.0	216.1	216.1	32	97.56%	1.46%	0.98%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-17	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	181	181	0	-17	-30	0.0	3	210.0	219.0	219.0	32	97.56%	1.46%	0.98%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-15	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	199	199	0	-15	60	3.0	3	210.0	219.6	219.6	32	97.56%	1.46%	0.98%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	NS Barrier Angle 1 (degrees)	NS Barrier Angle 2 (degrees)	NS Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	20	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	231	246	0	20	80	3.0	3	209.9	232.7	232.7	245	98.73%	0.48%	0.79%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	20	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	220	234	0	20	0	0.0	3	209.9	231.4	231.4	245	98.73%	0.48%	0.79%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	17	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	226	236	0	17	-60	0.0	3	209.9	229.0	229.0	245	98.73%	0.48%	0.79%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	21	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	203	218	0	21	-55	0.0	3	209.9	230.2	230.2	245	98.73%	0.48%	0.79%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	33	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	148	177	0	33	83	0.0	3	209.9	224.0	224.0	245	98.73%	0.48%	0.79%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	29	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	161	184	0	29	-30	0.0	3	209.9	224.6	224.6	245	98.73%	0.48%	0.79%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	29	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	175	200	0	29	45	3.0	3	209.9	226.0	226.0	245	98.73%	0.48%	0.79%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	41	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	101	134	0	41	85	3.0	3	209.9	218.2	218.2	245	98.73%	0.48%	0.79%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	39	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	95	122	0	39	85	0.0	3	209.9	218.0	218.0	245	98.73%	0.48%	0.79%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	34	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	84	0	34	-40	0.0	3	209.9	211.9	211.9	245	98.73%	0.48%	0.79%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	37	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	95	0	37	70	3.0	3	209.9	212.9	212.9	245	98.73%	0.48%	0.79%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	55	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	58	103	0	55	86	3.0	3	209.9	212.4	212.4	245	98.73%	0.48%	0.79%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	59	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	48	94	0	80	87	3.0	3	209.9	211.5	211.5	245	98.73%	0.48%	0.79%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	75	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	46	178	0	75	-45	0.0	3	209.9	210.1	210.1	245	98.73%	0.48%	0.79%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	70	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	188	0	70	50	0.0	3	209.9	209.8	209.8	245	98.73%	0.48%	0.79%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-2	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	293	293	0	-2	77	0.0	3	209.6	216.1	216.1	245	98.73%	0.48%	0.79%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-4	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	303	303	0	-4	-35	0.0	3	209.3	215.2	215.2	245	98.73%	0.48%	0.79%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-6	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	205	205	0	-6	81	0.0	3	209.3	213.0	213.0	245	98.73%	0.48%	0.79%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-8	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	216	216	0	-8	-35	0.0	3	209.2	212.7	212.7	245	98.73%	0.48%	0.79%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-30	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	84	84	0	-30	85	0.0	3	209.0	209.5	209.5	245	98.73%	0.48%	0.79%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-32	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	98	98	0	-32	-40	0.0	3	209.0	209.4	209.4	245	98.73%	0.48%	0.79%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-23	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	111	111	0	-23	50	3.0	3	209.0	209.6	209.6	245	98.73%	0.48%	0.79%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-66	88	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	22	22	0	-66	88	0.0	3	209.0	209.2	209.2	245	98.73%	0.48%	0.79%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-55	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	38	38	0	-55	-10	3.0	3	209.0	209.2	209.2	245	98.73%	0.48%	0.79%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-69	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	70	0	-69	0	3.0	3	210.8	210.3	210.3	245	98.73%	0.48%	0.79%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-67	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	72	0	-30	90	3.0	3	210.8	209.8	209.8	245	98.73%	0.48%	0.79%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-69	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	61	61	0	60	90	3.0	3	210.8	209.4	209.4	245	98.73%	0.48%	0.79%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-53	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	85	140	0	0	-53	0.0	3	209.9	219.4	219.4	245	98.73%	0.48%	0.79%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-61	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	69	140	0	70	-61	0.0	3	209.9	219.1	219.1	245	98.73%	0.48%	0.79%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-64	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	156	0	-89	-64	3.0	3	209.9	219.1	219.1	245	98.73%	0.48%	0.79%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-54	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	53	91	0	-89	-54	0.0	3	209.9	217.0	217.0	245	98.73%	0.48%	0.79%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-51	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	65	104	0	-89	-51	3.0	3	209.9	217.8	217.8	245	98.73%	0.48%	0.79%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-43	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	105	0	-45	-43	3.0	3	209.9	216.9	216.9	245	98.73%	0.48%	0.79%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	-9	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	117	118	0	0	-9	0.0	3	209.9	216.6	216.6	245	98.73%	0.48%	0.79%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-12	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	103	105	0	50	-12	0.0	3	209.9	216.1	216.1	245	98.73%	0.48%	0.79%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-20	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	96	103	0	-88	-70	3.0	3	209.9	216.1	216.1	245	98.73%	0.48%	0.79%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85	-18	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	174	183	0	-85	-30	3.0	3	209.9	219.0	219.0	245	98.73%	0.48%	0.79%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-13	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	191	196	0	-55	-13	3.0	3	209.9	219.6	219.6	245	98.73%	0.48%	0.79%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	NS Barrier Angle 1 (degrees)	NS Barrier Angle 2 (degrees)	NS Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	20	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	228	242	0	20	80	3.0	3	209.9	232.7	232.7	64	96.06%	1.85%	2.08%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	20	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	216	230	0	20	0	0.0	3	209.9	231.4	231.4	64	96.06%	1.85%	2.08%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	17	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	222	233	0	17	-60	0.0	3	209.9	229.0	229.0	64	96.06%	1.85%	2.08%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	21	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	200	215	0	21	-55	0.0	3	209.9	230.2	230.2	64	96.06%	1.85%	2.08%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	33	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	145	174	0	33	83	0.0	3	209.9	224.0	224.0	64	96.06%	1.85%	2.08%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	29	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	158	181	0	29	-30	0.0	3	209.9	224.6	224.6	64	96.06%	1.85%	2.08%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	29	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	171	197	0	29	45	3.0	3	209.9	226.0	226.0	64	96.06%	1.85%	2.08%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	42	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	98	131	0	42	85	3.0	3	209.9	218.2	218.2	64	96.06%	1.85%	2.08%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	40	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	91	119	0	40	85	0.0	3	209.9	218.0	218.0	64	96.06%	1.85%	2.08%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	35	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	67	81	0	35	-40	0.0	3	209.9	211.9	211.9	64	96.06%	1.85%	2.08%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	38	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	92	0	38	70	3.0	3	209.9	212.9	212.9	64	96.06%	1.85%	2.08%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	57	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	55	100	0	57	86	3.0	3	209.9	212.4	212.4	64	96.06%	1.85%	2.08%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	61	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	45	92	0	80	87	3.0	3	209.9	211.5	211.5	64	96.06%	1.85%	2.08%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	76	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	43	177	0	76	-45	0.0	3	209.9	210.1	210.1	64	96.06%	1.85%	2.08%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	72	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	186	0	72	50	0.0	3	209.9	209.8	209.8	64	96.06%	1.85%	2.08%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-2	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	290	290	0	-2	78	0.0	3	209.6	216.1	216.1	64	96.06%	1.85%	2.08%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-4	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	300	300	0	-4	-35	0.0	3	209.3	215.2	215.2	64	96.06%	1.85%	2.08%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-6	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	201	201	0	-6	81	0.0	3	209.3	213.0	213.0	64	96.06%	1.85%	2.08%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-7	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	213	213	0	-7	-35	0.0	3	209.3	212.7	212.7	64	96.06%	1.85%	2.08%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-31	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	81	0	-31	86	0.0	3	209.0	209.5	209.5	64	96.06%	1.85%	2.08%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-29	89	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	95	95	0	-29	-40	0.0	3	209.0	209.4	209.4	64	96.06%	1.85%	2.08%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-24	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	108	108	0	-24	50	3.0	3	209.0	209.6	209.6	64	96.06%	1.85%	2.08%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-69	89	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	19	19	0	-69	89	0.0	3	209.0	209.2	209.2	64	96.06%	1.85%	2.08%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-56	89	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	36	36	0	-56	-10	3.0	3	209.0	209.2	209.2	64	96.06%	1.85%	2.08%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-70	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	70	0	-70	0	3.0	3	210.8	210.3	210.3	64	96.06%	1.85%	2.08%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-68	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	72	0	-30	90	3.0	3	210.8	209.8	209.8	64	96.06%	1.85%	2.08%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-70	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	61	61	0	60	90	3.0	3	210.8	209.4	209.4	64	96.06%	1.85%	2.08%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-52	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	142	0	0	-52	0.0	3	209.9	219.4	219.4	64	96.06%	1.85%	2.08%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-59	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	141	0	70	-59	0.0	3	209.9	219.1	219.1	64	96.06%	1.85%	2.08%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-62	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	157	0	-89	-62	3.0	3	209.9	219.1	219.1	64	96.06%	1.85%	2.08%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-52	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	57	93	0	-89	-52	0.0	3	209.9	217.0	217.0	64	96.06%	1.85%	2.08%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-49	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	69	106	0	-88	-49	3.0	3	209.9	217.8	217.8	64	96.06%	1.85%	2.08%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-43	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	80	107	0	-45	-43	3.0	3	209.9	216.9	216.9	64	96.06%	1.85%	2.08%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	-9	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	120	121	0	0	-9	0.0	3	209.9	216.6	216.6	64	96.06%	1.85%	2.08%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	-11	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	106	108	0	50	-11	0.0	3	209.9	216.1	216.1	64	96.06%	1.85%	2.08%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-19	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	100	106	0	-88	-70	3.0	3	209.9	216.1	216.1	64	96.06%	1.85%	2.08%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85	-17	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	177	186	0	-85	-30	3.0	3	209.9	219.0	219.0	64	96.06%	1.85%	2.08%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-12	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	194	199	0	-55	-12	3.0	3	209.9	219.6	219.6	64	96.06%	1.85%	2.08%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	NS Barrier Angle 1 (degrees)	NS Barrier Angle 2 (degrees)	NS Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	20	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	224	239	0	20	80	3.0	3	209.9	232.7	232.7	576	94.76%	0.31%	4.94%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	21	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	213	227	0	21	0	0.0	3	209.9	231.4	231.4	576	94.76%	0.31%	4.94%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	17	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	219	229	0	17	-60	0.0	3	209.9	229.0	229.0	576	94.76%	0.31%	4.94%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	22	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	197	212	0	22	-55	0.0	3	209.9	230.2	230.2	576	94.76%	0.31%	4.94%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	34	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	142	171	0	34	83	0.0	3	209.9	224.0	224.0	576	94.76%	0.31%	4.94%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	30	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	154	178	0	30	-30	0.0	3	209.9	224.6	224.6	576	94.76%	0.31%	4.94%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	30	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	168	194	0	30	45	3.0	3	209.9	226.0	226.0	576	94.76%	0.31%	4.94%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	43	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	94	129	0	43	85	3.0	3	209.9	218.2	218.2	576	94.76%	0.31%	4.94%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	41	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	117	0	41	85	0.0	3	209.9	218.0	218.0	576	94.76%	0.31%	4.94%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	37	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	78	0	37	-40	0.0	3	209.9	211.9	211.9	576	94.76%	0.31%	4.94%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	40	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	69	90	0	40	70	3.0	3	209.9	212.9	212.9	576	94.76%	0.31%	4.94%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	59	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	99	0	59	87	3.0	3	209.9	212.4	212.4	576	94.76%	0.31%	4.94%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	63	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	41	91	0	63	87	3.0	3	209.9	211.5	211.5	576	94.76%	0.31%	4.94%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	74	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	176	0	74	-45	0.0	3	209.9	210.1	210.1	576	94.76%	0.31%	4.94%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	70	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	58	185	0	70	50	0.0	3	209.9	209.8	209.8	576	94.76%	0.31%	4.94%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-2	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	286	286	0	-2	78	0.0	3	209.7	216.1	216.1	576	94.76%	0.31%	4.94%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-4	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	296	296	0	-4	-35	0.0	3	209.4	215.2	215.2	576	94.76%	0.31%	4.94%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-6	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	198	198	0	-6	81	0.0	3	209.4	213.0	213.0	576	94.76%	0.31%	4.94%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-7	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	210	210	0	-7	-35	0.0	3	209.3	212.7	212.7	576	94.76%	0.31%	4.94%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-32	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	78	78	0	-32	86	0.0	3	209.1	209.5	209.5	576	94.76%	0.31%	4.94%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-33	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	91	91	0	-33	-40	0.0	3	209.0	209.4	209.4	576	94.76%	0.31%	4.94%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-24	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	104	104	0	-24	50	3.0	3	209.1	209.6	209.6	576	94.76%	0.31%	4.94%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-73	88	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	15	15	0	-73	88	0.0	3	209.0	209.2	209.2	576	94.76%	0.31%	4.94%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-59	88	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	32	32	0	-59	-10	3.0	3	209.0	209.2	209.2	576	94.76%	0.31%	4.94%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-71	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	62	0	-71	0	3.0	3	211.0	210.3	210.3	576	94.76%	0.31%	4.94%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-69	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	65	65	0	-69	90	3.0	3	211.8	209.8	209.8	576	94.76%	0.31%	4.94%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-71	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	54	0	-71	90	3.0	3	211.8	209.4	209.4	576	94.76%	0.31%	4.94%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-51	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	91	145	0	0	-51	0.0	3	209.9	219.4	219.4	576	94.76%	0.31%	4.94%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-61	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	75	143	0	70	-61	0.0	3	209.9	219.1	219.1	576	94.76%	0.31%	4.94%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-64	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	75	158	0	-90	-64	3.0	3	209.9	219.1	219.1	576	94.76%	0.31%	4.94%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-51	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	95	0	-90	-51	0.0	3	209.9	217.0	217.0	576	94.76%	0.31%	4.94%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-48	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	108	0	-89	-48	3.0	3	209.9	217.8	217.8	576	94.76%	0.31%	4.94%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-41	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	83	110	0	-45	-41	3.0	3	209.9	216.9	216.9	576	94.76%	0.31%	4.94%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	-9	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	123	125	0	0	-9	0.0	3	209.9	216.6	216.6	576	94.76%	0.31%	4.94%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-11	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	110	112	0	50	-11	0.0	3	209.9	216.1	216.1	576	94.76%	0.31%	4.94%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-19	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	103	109	0	-88	-70	3.0	3	209.9	216.1	216.1	576	94.76%	0.31%	4.94%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85	-17	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	181	189	0	-85	-30	3.0	3	209.9	219.0	219.0	576	94.76%	0.31%	4.94%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-12	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	198	203	0	-55	-12	3.0	3	209.9	219.6	219.6	576	94.76%	0.31%	4.94%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	EW Barrier Angle 1 (degrees)	EW Barrier Angle 2 (degrees)	EW Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	56	243	0	-90	-76	3.0	3	209.7	232.7	232.7	348	98.63%	0.10%	1.27%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-75	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	231	0	5	-75	0.0	3	209.7	231.4	231.4	348	98.63%	0.10%	1.27%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	233	0	-90	-79	0.0	3	209.7	229.0	229.0	348	98.63%	0.10%	1.27%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-74	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	216	0	-90	-74	0.0	3	209.7	230.2	230.2	348	98.63%	0.10%	1.27%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-62	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	80	177	0	30	-62	0.0	3	209.7	224.0	224.0	348	98.63%	0.10%	1.27%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-66	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	183	0	-90	-66	0.0	3	209.7	224.6	224.6	348	98.63%	0.10%	1.27%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-66	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	199	0	-90	-66	3.0	3	209.7	226.0	226.0	348	98.63%	0.10%	1.27%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-55	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	78	134	0	-60	-55	3.0	3	209.7	218.2	218.2	348	98.63%	0.10%	1.27%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-57	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	68	122	0	25	-57	0.0	3	209.7	218.0	218.0	348	98.63%	0.10%	1.27%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-61	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	84	0	-90	-61	0.0	3	209.7	211.9	211.9	348	98.63%	0.10%	1.27%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-58	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	52	95	0	-90	-58	3.0	3	209.7	212.9	212.9	348	98.63%	0.10%	1.27%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-40	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	105	0	-90	-40	3.0	3	209.7	212.4	212.4	348	98.63%	0.10%	1.27%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-36	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	79	97	0	0	-36	0.0	3	209.7	211.5	211.5	348	98.63%	0.10%	1.27%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-22	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	169	182	0	80	-22	0.0	3	209.7	210.1	210.1	348	98.63%	0.10%	1.27%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-27	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	172	192	0	-89	-45	3.0	3	209.7	209.8	209.8	348	98.63%	0.10%	1.27%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	82	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	288	0	82	-40	0.0	3	209.7	216.1	216.1	348	98.63%	0.10%	1.27%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	80	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	298	0	80	60	0.0	3	209.7	215.2	215.2	348	98.63%	0.10%	1.27%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	78	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	200	0	78	-50	0.0	3	209.7	213.0	213.0	348	98.63%	0.10%	1.27%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	76	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	56	213	0	76	60	0.0	3	209.7	212.7	212.7	348	98.63%	0.10%	1.27%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	52	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	55	90	0	52	-55	0.0	3	209.7	209.5	209.5	348	98.63%	0.10%	1.27%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	50	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	68	108	0	50	55	3.0	3	209.7	209.4	209.4	348	98.63%	0.10%	1.27%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	59	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	114	0	59	84	3.0	3	209.7	209.6	209.6	348	98.63%	0.10%	1.27%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	13	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	45	47	0	13	-50	0.0	3	209.7	209.2	209.2	348	98.63%	0.10%	1.27%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	24	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	53	59	0	24	70	3.0	3	209.7	209.2	209.2	348	98.63%	0.10%	1.27%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	5	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	226	227	0	5	60	3.0	3	209.7	210.3	210.3	348	98.63%	0.10%	1.27%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	6	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	216	217	0	6	45	3.0	3	209.7	209.8	209.8	348	98.63%	0.10%	1.27%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	4	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	211	211	0	4	81	0.0	3	209.7	209.4	209.4	348	98.63%	0.10%	1.27%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	32	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	125	125	0	80	32	0.0	3	211.9	219.4	219.4	348	98.63%	0.10%	1.27%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	25	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	133	133	0	-86	-55	3.0	3	211.0	219.1	219.1	348	98.63%	0.10%	1.27%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	22	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	150	150	0	-86	20	3.0	3	211.0	219.1	219.1	348	98.63%	0.10%	1.27%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	31	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	83	83	0	-88	-30	3.0	3	210.3	217.0	217.0	348	98.63%	0.10%	1.27%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	34	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	92	92	0	-70	34	3.0	3	211.0	217.8	217.8	348	98.63%	0.10%	1.27%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	41	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	84	84	0	35	41	3.0	3	211.6	216.9	216.9	348	98.63%	0.10%	1.27%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	72	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	36	36	0	80	72	0.0	3	214.3	216.6	216.6	348	98.63%	0.10%	1.27%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	70	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	37	37	0	-90	70	0.0	3	213.2	216.1	216.1	348	98.63%	0.10%	1.27%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	62	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	50	0	-89	0	3.0	3	212.8	216.1	216.1	348	98.63%	0.10%	1.27%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	65	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	78	78	0	-70	55	3.0	3	217.2	219.0	219.0	348	98.63%	0.10%	1.27%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	75	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	66	0	30	75	3.0	3	217.9	219.6	219.6	348	98.63%	0.10%	1.27%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	EW Barrier Angle 1 (degrees)	EW Barrier Angle 2 (degrees)	EW Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT			
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -77	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	52	241	0	-90	-77	3.0	3	210.0	232.7	232.7	267	98.64%	0.06%	1.30%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -77	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	229	0	5	-77	0.0	3	210.0	231.4	231.4	267	98.64%	0.06%	1.30%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	38	231	0	-90	-80	0.0	3	210.0	229.0	229.0	267	98.64%	0.06%	1.30%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -76	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	213	0	-90	-76	0.0	3	210.0	230.2	230.2	267	98.64%	0.06%	1.30%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -64	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	172	0	30	-64	0.0	3	210.0	224.0	224.0	267	98.64%	0.06%	1.30%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -68	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	179	0	-90	-68	0.0	3	210.0	224.6	224.6	267	98.64%	0.06%	1.30%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -68	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	195	0	-90	-68	3.0	3	210.0	226.0	226.0	267	98.64%	0.06%	1.30%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -56	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	74	129	0	-60	-56	3.0	3	210.0	218.2	218.2	267	98.64%	0.06%	1.30%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -58	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	64	117	0	25	-58	0.0	3	210.0	218.0	218.0	267	98.64%	0.06%	1.30%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -63	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	37	79	0	-90	-63	0.0	3	210.0	211.9	211.9	267	98.64%	0.06%	1.30%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -59	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	90	0	-90	-59	3.0	3	210.0	212.9	212.9	267	98.64%	0.06%	1.30%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -40	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	98	0	-90	-40	3.0	3	210.0	212.4	212.4	267	98.64%	0.06%	1.30%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 -36	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	74	90	0	0	-36	0.0	3	210.0	211.5	211.5	267	98.64%	0.06%	1.30%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87 -21	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	164	174	0	80	-21	0.0	3	210.0	210.1	210.1	267	98.64%	0.06%	1.30%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87 -25	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	167	184	0	-87	-45	3.0	3	210.0	209.8	209.8	267	98.64%	0.06%	1.30%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	80 87	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	289	0	80	-40	0.0	3	210.0	216.1	216.1	267	98.64%	0.06%	1.30%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	78 87	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	299	0	78	60	0.0	3	210.0	215.2	215.2	267	98.64%	0.06%	1.30%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	76 87	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	202	0	76	-50	0.0	3	210.0	213.0	213.0	267	98.64%	0.06%	1.30%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	74 87	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	214	0	74	60	0.0	3	210.0	212.7	212.7	267	98.64%	0.06%	1.30%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	50 86	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	95	0	50	-55	0.0	3	210.0	209.5	209.5	267	98.64%	0.06%	1.30%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	48 85	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	112	0	48	55	3.0	3	210.0	209.4	209.4	267	98.64%	0.06%	1.30%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	56 85	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	118	0	56	85	3.0	3	210.0	209.6	209.6	267	98.64%	0.06%	1.30%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	13 88	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	53	54	0	13	-50	0.0	3	210.0	209.2	209.2	267	98.64%	0.06%	1.30%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	24 87	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	66	0	24	70	3.0	3	210.0	209.2	209.2	267	98.64%	0.06%	1.30%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	7 82	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	233	235	0	7	60	3.0	3	210.0	210.3	210.3	267	98.64%	0.06%	1.30%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	7 81	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	222	225	0	7	45	3.0	3	210.0	209.8	209.8	267	98.64%	0.06%	1.30%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	6 83	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	218	219	0	6	83	0.0	3	210.0	209.4	209.4	267	98.64%	0.06%	1.30%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87 33	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	118	118	0	80	33	0.0	3	212.3	219.4	219.4	267	98.64%	0.06%	1.30%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87 26	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	126	126	0	-87	-55	3.0	3	211.4	219.1	219.1	267	98.64%	0.06%	1.30%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86 23	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	143	143	0	-86	20	3.0	3	211.3	219.1	219.1	267	98.64%	0.06%	1.30%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 33	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	77	0	-88	-30	3.0	3	210.7	217.0	217.0	267	98.64%	0.06%	1.30%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 36	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	85	85	0	-70	36	3.0	3	211.4	217.8	217.8	267	98.64%	0.06%	1.30%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 43	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	77	0	35	43	3.0	3	212.0	216.9	216.9	267	98.64%	0.06%	1.30%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 76	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	29	29	0	80	76	0.0	3	214.9	216.6	216.6	267	98.64%	0.06%	1.30%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 74	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	30	30	0	-90	74	0.0	3	213.9	216.1	216.1	267	98.64%	0.06%	1.30%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 66	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	43	43	0	-89	0	3.0	3	213.3	216.1	216.1	267	98.64%	0.06%	1.30%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 68	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	71	71	0	-70	55	3.0	3	217.3	219.0	219.0	267	98.64%	0.06%	1.30%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 74	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	60	0	30	74	3.0	3	217.9	219.6	219.6	267	98.64%	0.06%	1.30%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	EW Barrier Angle 1 (degrees)	EW Barrier Angle 2 (degrees)	EW Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	56	243	0	-90	-77	3.0	3	209.8	232.7	232.7	314	91.10%	0.37%	8.53%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	231	0	5	-76	0.0	3	209.8	231.4	231.4	314	91.10%	0.37%	8.53%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	234	0	-90	-79	0.0	3	209.8	229.0	229.0	314	91.10%	0.37%	8.53%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-75	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	55	216	0	-90	-75	0.0	3	209.8	230.2	230.2	314	91.10%	0.37%	8.53%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-62	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	80	176	0	30	-62	0.0	3	209.8	224.0	224.0	314	91.10%	0.37%	8.53%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-67	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	182	0	-90	-67	0.0	3	209.8	224.6	224.6	314	91.10%	0.37%	8.53%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-67	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	198	0	-90	-67	3.0	3	209.8	226.0	226.0	314	91.10%	0.37%	8.53%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-54	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	133	0	-60	-54	3.0	3	209.8	218.2	218.2	314	91.10%	0.37%	8.53%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-56	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	67	121	0	25	-56	0.0	3	209.8	218.0	218.0	314	91.10%	0.37%	8.53%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-60	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	40	83	0	-90	-60	0.0	3	209.8	211.9	211.9	314	91.10%	0.37%	8.53%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	-57	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	94	0	-90	-57	3.0	3	209.8	212.9	212.9	314	91.10%	0.37%	8.53%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-38	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	79	102	0	-88	-38	3.0	3	209.8	212.4	212.4	314	91.10%	0.37%	8.53%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-34	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	94	0	0	-34	0.0	3	209.8	211.5	211.5	314	91.10%	0.37%	8.53%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	-20	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	167	179	0	80	-20	0.0	3	209.8	210.1	210.1	314	91.10%	0.37%	8.53%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	-24	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	171	188	0	-86	-45	3.0	3	209.8	209.8	209.8	314	91.10%	0.37%	8.53%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	81	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	290	0	81	-40	0.0	3	209.8	216.1	216.1	314	91.10%	0.37%	8.53%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	79	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	300	0	79	60	0.0	3	209.8	215.2	215.2	314	91.10%	0.37%	8.53%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	77	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	202	0	77	-50	0.0	3	209.8	213.0	213.0	314	91.10%	0.37%	8.53%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	75	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	55	215	0	75	60	0.0	3	209.8	212.7	212.7	314	91.10%	0.37%	8.53%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	51	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	57	94	0	51	-55	0.0	3	209.8	209.5	209.5	314	91.10%	0.37%	8.53%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	50	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	111	0	50	55	3.0	3	209.8	209.4	209.4	314	91.10%	0.37%	8.53%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	58	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	117	0	58	85	3.0	3	209.8	209.6	209.6	314	91.10%	0.37%	8.53%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	10	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	49	51	0	10	-50	0.0	3	209.8	209.2	209.2	314	91.10%	0.37%	8.53%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	23	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	57	63	0	23	70	3.0	3	209.8	209.2	209.2	314	91.10%	0.37%	8.53%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	5	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	230	231	0	5	60	3.0	3	209.8	210.3	210.3	314	91.10%	0.37%	8.53%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	7	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	220	221	0	7	45	3.0	3	209.8	209.8	209.8	314	91.10%	0.37%	8.53%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	4	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	214	215	0	4	80	0.0	3	209.8	209.4	209.4	314	91.10%	0.37%	8.53%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	32	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	122	122	0	80	32	0.0	3	212.1	219.4	219.4	314	91.10%	0.37%	8.53%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	25	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	130	130	0	-87	-55	3.0	3	211.2	219.1	219.1	314	91.10%	0.37%	8.53%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	22	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	147	147	0	-86	20	3.0	3	211.1	219.1	219.1	314	91.10%	0.37%	8.53%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	31	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	81	0	-88	-30	3.0	3	210.5	217.0	217.0	314	91.10%	0.37%	8.53%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	34	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	89	89	0	-70	34	3.0	3	211.2	217.8	217.8	314	91.10%	0.37%	8.53%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	42	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	81	0	35	42	3.0	3	211.8	216.9	216.9	314	91.10%	0.37%	8.53%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	75	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	33	33	0	80	75	0.0	3	214.6	216.6	216.6	314	91.10%	0.37%	8.53%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	72	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	34	34	0	-90	72	0.0	3	213.6	216.1	216.1	314	91.10%	0.37%	8.53%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	64	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	47	0	-89	0	3.0	3	213.0	216.1	216.1	314	91.10%	0.37%	8.53%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	66	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	75	75	0	-70	55	3.0	3	217.2	219.0	219.0	314	91.10%	0.37%	8.53%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	62	0	30	76	3.0	3	218.0	219.6	219.6	314	91.10%	0.37%	8.53%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	EW Barrier Angle 1 (degrees)	EW Barrier Angle 2 (degrees)	EW Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT			
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-76 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	56	56	0	-76	50	3.0	3	219.2	232.7	232.7	282	98.70%	0.00%	1.30%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-75 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	54	0	5	80	3.0	3	218.4	231.4	231.4	282	98.70%	0.00%	1.30%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-79 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	42	0	-79	80	0.0	3	218.8	229.0	229.0	282	98.70%	0.00%	1.30%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-74 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	54	0	-74	80	0.0	3	217.3	230.2	230.2	282	98.70%	0.00%	1.30%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-62 78	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	80	80	0	30	78	3.0	3	214.2	224.0	224.0	282	98.70%	0.00%	1.30%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-66 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	70	0	-66	79	0.0	3	215.0	224.6	224.6	282	98.70%	0.00%	1.30%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-66 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	77	0	-66	-40	3.0	3	216.2	226.0	226.0	282	98.70%	0.00%	1.30%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-55 78	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	78	78	0	-55	60	3.0	3	211.8	218.2	218.2	282	98.70%	0.00%	1.30%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-57 78	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	68	68	0	25	78	3.0	3	211.5	218.0	218.0	282	98.70%	0.00%	1.30%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-61 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	42	0	-61	79	0.0	3	210.2	211.9	211.9	282	98.70%	0.00%	1.30%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-58 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	52	52	0	-58	25	3.0	3	210.4	212.9	212.9	282	98.70%	0.00%	1.30%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-40 78	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	81	0	-40	25	3.0	3	210.1	212.4	212.4	282	98.70%	0.00%	1.30%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-36 78	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	79	79	0	0	78	3.0	3	210.0	211.5	211.5	282	98.70%	0.00%	1.30%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-22 74	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	169	169	0	80	74	0.0	3	210.2	210.1	210.1	282	98.70%	0.00%	1.30%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-27 73	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	172	172	0	-27	-45	0.0	3	210.7	209.8	209.8	282	98.70%	0.00%	1.30%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 82	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	47	0	-90	-40	3.0	3	222.4	216.1	216.1	282	98.70%	0.00%	1.30%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	59	0	-70	60	3.0	3	221.4	215.2	215.2	282	98.70%	0.00%	1.30%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 78	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	47	0	-90	-50	3.0	3	216.8	213.0	213.0	282	98.70%	0.00%	1.30%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 76	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	56	56	0	-90	60	3.0	3	217.2	212.7	212.7	282	98.70%	0.00%	1.30%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 52	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	55	55	0	-90	-55	3.0	3	210.2	209.5	209.5	282	98.70%	0.00%	1.30%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 50	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	68	68	0	-65	50	3.0	3	210.4	209.4	209.4	282	98.70%	0.00%	1.30%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 59	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	59	0	40	59	3.0	3	211.4	209.6	209.6	282	98.70%	0.00%	1.30%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 13	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	45	45	0	-90	-50	3.0	3	209.7	209.2	209.2	282	98.70%	0.00%	1.30%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 24	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	53	53	0	-65	24	3.0	3	209.8	209.2	209.2	282	98.70%	0.00%	1.30%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86 5	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	226	226	0	-30	5	3.0	3	209.7	210.3	210.3	282	98.70%	0.00%	1.30%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87 6	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	216	216	0	-30	6	3.0	3	209.8	209.8	209.8	282	98.70%	0.00%	1.30%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87 4	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	211	211	0	-87	4	0.0	3	209.7	209.4	209.4	282	98.70%	0.00%	1.30%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	32 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	125	148	0	80	80	3.0	3	209.7	219.4	219.4	282	98.70%	0.00%	1.30%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	25 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	133	147	0	25	-55	0.0	3	209.7	219.1	219.1	282	98.70%	0.00%	1.30%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	22 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	150	163	0	22	20	0.0	3	209.7	219.1	219.1	282	98.70%	0.00%	1.30%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	31 82	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	83	98	0	31	-30	0.0	3	209.7	217.0	217.0	282	98.70%	0.00%	1.30%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	34 82	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	92	111	0	34	60	3.0	3	209.7	217.8	217.8	282	98.70%	0.00%	1.30%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	41 82	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	84	112	0	41	82	3.0	3	209.7	216.9	216.9	282	98.70%	0.00%	1.30%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	72 84	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	36	124	0	80	84	3.0	3	209.7	216.6	216.6	282	98.70%	0.00%	1.30%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	70 84	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	37	111	0	70	84	0.0	3	209.7	216.1	216.1	282	98.70%	0.00%	1.30%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	62 84	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	109	0	62	0	0.0	3	209.7	216.1	216.1	282	98.70%	0.00%	1.30%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	65 82	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	78	189	0	65	55	0.0	3	209.7	219.0	219.0	282	98.70%	0.00%	1.30%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	75 88	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	202	0	75	88	3.0	3	209.7	219.6	219.6	282	98.70%	0.00%	1.30%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	EW Barrier Angle 1 (degrees)	EW Barrier Angle 2 (degrees)	EW Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	56	56	0	-77	50	3.0	3	219.2	232.7	232.7	33	98.94%	0.00%	1.06%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-76	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	54	0	5	80	3.0	3	218.3	231.4	231.4	33	98.94%	0.00%	1.06%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-79	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	42	0	-79	80	0.0	3	218.7	229.0	229.0	33	98.94%	0.00%	1.06%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-75	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	55	55	0	-75	80	0.0	3	217.3	230.2	230.2	33	98.94%	0.00%	1.06%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-62	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	80	80	0	30	79	3.0	3	214.1	224.0	224.0	33	98.94%	0.00%	1.06%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-67	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	70	0	-67	79	0.0	3	215.0	224.6	224.6	33	98.94%	0.00%	1.06%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-67	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	77	0	-67	-40	3.0	3	216.2	226.0	226.0	33	98.94%	0.00%	1.06%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-54	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	77	0	-54	60	3.0	3	211.8	218.2	218.2	33	98.94%	0.00%	1.06%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-56	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	67	67	0	25	80	3.0	3	211.6	218.0	218.0	33	98.94%	0.00%	1.06%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-60	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	40	40	0	-60	82	0.0	3	210.3	211.9	211.9	33	98.94%	0.00%	1.06%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-57	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	50	0	-57	25	3.0	3	210.4	212.9	212.9	33	98.94%	0.00%	1.06%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-38	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	79	79	0	-38	25	3.0	3	210.2	212.4	212.4	33	98.94%	0.00%	1.06%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-34	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	77	0	0	80	3.0	3	210.0	211.5	211.5	33	98.94%	0.00%	1.06%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-20	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	167	167	0	80	76	0.0	3	210.2	210.1	210.1	33	98.94%	0.00%	1.06%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-24	75	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	171	171	0	-24	-45	0.0	3	210.5	209.8	209.8	33	98.94%	0.00%	1.06%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	47	0	-90	-40	3.0	3	222.9	216.1	216.1	33	98.94%	0.00%	1.06%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	59	0	-70	60	3.0	3	221.4	215.2	215.2	33	98.94%	0.00%	1.06%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	47	0	-90	-50	3.0	3	216.8	213.0	213.0	33	98.94%	0.00%	1.06%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	75	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	55	55	0	-90	60	3.0	3	217.2	212.7	212.7	33	98.94%	0.00%	1.06%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	51	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	57	57	0	-90	-55	3.0	3	210.3	209.5	209.5	33	98.94%	0.00%	1.06%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	50	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	70	0	-65	50	3.0	3	210.7	209.4	209.4	33	98.94%	0.00%	1.06%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	58	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	60	0	40	58	3.0	3	211.5	209.6	209.6	33	98.94%	0.00%	1.06%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	10	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	49	49	0	-90	-50	3.0	3	209.8	209.2	209.2	33	98.94%	0.00%	1.06%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	23	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	57	57	0	-65	23	3.0	3	209.8	209.2	209.2	33	98.94%	0.00%	1.06%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	5	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	230	230	0	-30	5	3.0	3	209.8	210.3	210.3	33	98.94%	0.00%	1.06%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	7	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	220	220	0	-30	7	3.0	3	209.8	209.8	209.8	33	98.94%	0.00%	1.06%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	4	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	214	214	0	-87	4	0.0	3	209.8	209.4	209.4	33	98.94%	0.00%	1.06%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	32	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	122	146	0	80	79	0.0	3	209.8	219.4	219.4	33	98.94%	0.00%	1.06%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	25	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	130	145	0	25	-55	0.0	3	209.8	219.1	219.1	33	98.94%	0.00%	1.06%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	22	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	147	160	0	22	20	0.0	3	209.8	219.1	219.1	33	98.94%	0.00%	1.06%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	31	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	96	0	31	-30	0.0	3	209.8	217.0	217.0	33	98.94%	0.00%	1.06%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	34	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	89	109	0	34	60	3.0	3	209.8	217.8	217.8	33	98.94%	0.00%	1.06%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	42	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	110	0	42	81	3.0	3	209.8	216.9	216.9	33	98.94%	0.00%	1.06%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	75	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	33	125	0	80	84	3.0	3	209.8	216.6	216.6	33	98.94%	0.00%	1.06%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	72	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	34	112	0	72	84	0.0	3	209.8	216.1	216.1	33	98.94%	0.00%	1.06%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	64	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	109	0	64	0	0.0	3	209.8	216.1	216.1	33	98.94%	0.00%	1.06%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	66	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	75	189	0	66	55	0.0	3	209.8	219.0	219.0	33	98.94%	0.00%	1.06%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	76	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	203	0	76	87	3.0	3	209.8	219.6	219.6	33	98.94%	0.00%	1.06%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	EW Barrier Angle 1 (degrees)	EW Barrier Angle 2 (degrees)	EW Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT			
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-74 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	56	56	0	-74	50	3.0	3	219.2	232.7	232.7	113	96.00%	3.08%	0.92%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-74 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	54	0	5	80	3.0	3	218.3	231.4	231.4	113	96.00%	3.08%	0.92%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	42	0	-77	80	0.0	3	218.7	229.0	229.0	113	96.00%	3.08%	0.92%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-73 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	55	55	0	-73	80	0.0	3	217.3	230.2	230.2	113	96.00%	3.08%	0.92%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-60 78	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	80	80	0	30	78	3.0	3	214.1	224.0	224.0	113	96.00%	3.08%	0.92%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-64 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	70	0	-64	79	0.0	3	215.0	224.6	224.6	113	96.00%	3.08%	0.92%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-64 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	77	0	-64	-40	3.0	3	216.2	226.0	226.0	113	96.00%	3.08%	0.92%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-56 73	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	79	79	0	-56	60	3.0	3	211.9	218.2	218.2	113	96.00%	3.08%	0.92%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-58 74	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	69	69	0	25	74	3.0	3	211.5	218.0	218.0	113	96.00%	3.08%	0.92%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-57 78	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	44	44	0	-57	78	0.0	3	210.2	211.9	211.9	113	96.00%	3.08%	0.92%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-54 78	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	54	0	-54	25	3.0	3	210.2	212.9	212.9	113	96.00%	3.08%	0.92%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-37 77	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	84	84	0	-37	25	3.0	3	210.1	212.4	212.4	113	96.00%	3.08%	0.92%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-32 77	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	82	82	0	0	77	3.0	3	210.0	211.5	211.5	113	96.00%	3.08%	0.92%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-21 73	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	172	172	0	80	73	0.0	3	210.1	210.1	210.1	113	96.00%	3.08%	0.92%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-25 72	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	174	174	0	-25	-45	0.0	3	210.7	209.8	209.8	113	96.00%	3.08%	0.92%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 82	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	47	0	-90	-40	3.0	3	222.9	216.1	216.1	113	96.00%	3.08%	0.92%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	59	0	-70	60	3.0	3	221.4	215.2	215.2	113	96.00%	3.08%	0.92%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	47	0	-90	-50	3.0	3	216.8	213.0	213.0	113	96.00%	3.08%	0.92%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 77	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	56	56	0	-90	60	3.0	3	217.2	212.7	212.7	113	96.00%	3.08%	0.92%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 51	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	53	53	0	-90	-55	3.0	3	210.1	209.5	209.5	113	96.00%	3.08%	0.92%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 49	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	66	0	-65	49	3.0	3	210.3	209.4	209.4	113	96.00%	3.08%	0.92%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 58	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	57	57	0	40	58	3.0	3	211.1	209.6	209.6	113	96.00%	3.08%	0.92%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 4	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	41	41	0	-90	-50	3.0	3	209.6	209.2	209.2	113	96.00%	3.08%	0.92%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 20	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	50	0	-65	20	3.0	3	209.7	209.2	209.2	113	96.00%	3.08%	0.92%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 1	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	222	222	0	-30	1	3.0	3	209.6	210.3	210.3	113	96.00%	3.08%	0.92%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 2	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	212	212	0	-30	2	3.0	3	209.6	209.8	209.8	113	96.00%	3.08%	0.92%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 0	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	207	207	0	-90	0	0.0	3	209.6	209.4	209.4	113	96.00%	3.08%	0.92%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	28 76	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	128	155	0	80	76	0.0	3	209.6	219.4	219.4	113	96.00%	3.08%	0.92%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	21 75	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	137	154	0	21	-55	0.0	3	209.6	219.1	219.1	113	96.00%	3.08%	0.92%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	19 74	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	154	169	0	19	20	3.0	3	209.6	219.1	219.1	113	96.00%	3.08%	0.92%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	25 75	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	87	105	0	25	-30	0.0	3	209.6	217.0	217.0	113	96.00%	3.08%	0.92%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	29 75	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	96	118	0	29	60	3.0	3	209.6	217.8	217.8	113	96.00%	3.08%	0.92%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	36 77	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	119	0	36	77	3.0	3	209.6	216.9	216.9	113	96.00%	3.08%	0.92%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	70 82	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	40	131	0	80	82	3.0	3	209.6	216.6	216.6	113	96.00%	3.08%	0.92%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	67 82	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	41	118	0	67	82	0.0	3	209.6	216.1	216.1	113	96.00%	3.08%	0.92%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	59 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	117	0	59	0	0.0	3	209.6	216.1	216.1	113	96.00%	3.08%	0.92%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	68 85	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	78	196	0	68	55	0.0	3	209.6	219.0	219.0	113	96.00%	3.08%	0.92%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	73 86	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	209	0	73	86	3.0	3	209.6	219.6	219.6	113	96.00%	3.08%	0.92%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	EW Barrier Angle 1 (degrees)	EW Barrier Angle 2 (degrees)	EW Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	52	52	0	-77	50	3.0	3	219.8	232.7	232.7	331	98.10%	0.44%	1.46%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	50	0	5	80	3.0	3	218.9	231.4	231.4	331	98.10%	0.44%	1.46%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	38	38	0	-80	80	0.0	3	219.3	229.0	229.0	331	98.10%	0.44%	1.46%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-76	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	51	0	-76	80	0.0	3	217.8	230.2	230.2	331	98.10%	0.44%	1.46%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-64	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	76	0	30	78	3.0	3	214.5	224.0	224.0	331	98.10%	0.44%	1.46%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-68	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	66	0	-68	80	0.0	3	215.3	224.6	224.6	331	98.10%	0.44%	1.46%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-68	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	73	0	-68	-40	3.0	3	216.6	226.0	226.0	331	98.10%	0.44%	1.46%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-56	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	74	74	0	-56	60	3.0	3	212.2	218.2	218.2	331	98.10%	0.44%	1.46%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-58	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	64	64	0	25	79	3.0	3	211.8	218.0	218.0	331	98.10%	0.44%	1.46%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-63	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	37	37	0	-63	82	0.0	3	210.4	211.9	211.9	331	98.10%	0.44%	1.46%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-59	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	47	0	-59	25	3.0	3	210.6	212.9	212.9	331	98.10%	0.44%	1.46%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-40	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	76	0	-40	25	3.0	3	210.3	212.4	212.4	331	98.10%	0.44%	1.46%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-36	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	74	74	0	0	80	3.0	3	210.1	211.5	211.5	331	98.10%	0.44%	1.46%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-21	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	164	164	0	80	76	0.0	3	210.3	210.1	210.1	331	98.10%	0.44%	1.46%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-25	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	167	167	0	-25	-45	0.0	3	210.6	209.8	209.8	331	98.10%	0.44%	1.46%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	50	0	-90	-40	3.0	3	222.3	216.1	216.1	331	98.10%	0.44%	1.46%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	63	0	-70	60	3.0	3	222.9	215.2	215.2	331	98.10%	0.44%	1.46%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	51	0	-90	-50	3.0	3	217.2	213.0	213.0	331	98.10%	0.44%	1.46%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	74	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	59	0	-90	60	3.0	3	217.7	212.7	212.7	331	98.10%	0.44%	1.46%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	50	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	60	0	-90	-55	3.0	3	210.4	209.5	209.5	331	98.10%	0.44%	1.46%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	48	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	73	0	-65	48	3.0	3	210.7	209.4	209.4	331	98.10%	0.44%	1.46%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	56	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	63	0	40	56	3.0	3	211.7	209.6	209.6	331	98.10%	0.44%	1.46%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	13	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	53	53	0	-90	-50	3.0	3	209.9	209.2	209.2	331	98.10%	0.44%	1.46%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	24	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	60	0	-65	24	3.0	3	209.9	209.2	209.2	331	98.10%	0.44%	1.46%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	7	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	233	233	0	-30	7	3.0	3	209.9	210.3	210.3	331	98.10%	0.44%	1.46%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	7	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	222	222	0	-30	7	3.0	3	209.9	209.8	209.8	331	98.10%	0.44%	1.46%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	6	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	218	218	0	-84	6	0.0	3	209.9	209.4	209.4	331	98.10%	0.44%	1.46%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	33	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	118	142	0	80	80	3.0	3	210.0	219.4	219.4	331	98.10%	0.44%	1.46%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	26	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	126	141	0	26	-55	0.0	3	210.0	219.1	219.1	331	98.10%	0.44%	1.46%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	23	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	143	156	0	23	20	0.0	3	210.0	219.1	219.1	331	98.10%	0.44%	1.46%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	33	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	92	0	33	-30	0.0	3	210.0	217.0	217.0	331	98.10%	0.44%	1.46%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	36	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	85	105	0	36	60	3.0	3	210.0	217.8	217.8	331	98.10%	0.44%	1.46%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	43	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	107	0	43	82	3.0	3	210.0	216.9	216.9	331	98.10%	0.44%	1.46%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	76	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	29	123	0	80	84	3.0	3	210.0	216.6	216.6	331	98.10%	0.44%	1.46%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	74	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	30	110	0	74	84	0.0	3	210.0	216.1	216.1	331	98.10%	0.44%	1.46%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	66	84	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	43	107	0	66	0	0.0	3	210.0	216.1	216.1	331	98.10%	0.44%	1.46%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	68	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	71	187	0	68	55	0.0	3	210.0	219.0	219.0	331	98.10%	0.44%	1.46%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	74	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	201	0	74	85	3.0	3	210.0	219.6	219.6	331	98.10%	0.44%	1.46%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	NS Barrier Angle 1 (degrees)	NS Barrier Angle 2 (degrees)	NS Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	18	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	235	235	0	0	18	3.0	3	209.7	232.7	232.7	69	97.37%	0.00%	2.63%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	18	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	223	223	0	-70	0	3.0	3	209.5	231.4	231.4	69	97.37%	0.00%	2.63%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	15	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	229	229	0	-80	-60	3.0	3	209.4	229.0	229.0	69	97.37%	0.00%	2.63%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	19	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	207	207	0	-81	-55	3.0	3	209.4	230.2	230.2	69	97.37%	0.00%	2.63%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	30	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	152	152	0	-84	30	0.0	3	210.1	224.0	224.0	69	97.37%	0.00%	2.63%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-83	26	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	164	164	0	-83	-30	3.0	3	210.0	224.6	224.6	69	97.37%	0.00%	2.63%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-83	26	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	178	178	0	-55	26	3.0	3	210.1	226.0	226.0	69	97.37%	0.00%	2.63%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	37	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	104	104	0	40	37	0.0	3	210.0	218.2	218.2	69	97.37%	0.00%	2.63%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	35	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	98	98	0	-86	35	0.0	3	209.4	218.0	218.0	69	97.37%	0.00%	2.63%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	28	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	73	0	-87	-40	3.0	3	209.5	211.9	211.9	69	97.37%	0.00%	2.63%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	32	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	79	79	0	-55	32	3.0	3	209.8	212.9	212.9	69	97.37%	0.00%	2.63%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87	51	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	61	61	0	0	51	3.0	3	209.9	212.4	212.4	69	97.37%	0.00%	2.63%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	55	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	51	0	80	55	0.0	3	209.6	211.5	211.5	69	97.37%	0.00%	2.63%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	75	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	47	0	-86	-45	3.0	3	211.0	210.1	210.1	69	97.37%	0.00%	2.63%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	70	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	62	0	-86	50	3.0	3	211.0	209.8	209.8	69	97.37%	0.00%	2.63%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-74	0	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	297	298	0	-74	0	0.0	3	210.0	216.1	216.1	69	97.37%	0.00%	2.63%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-74	-2	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	307	309	0	-74	-35	3.0	3	210.0	215.2	215.2	69	97.37%	0.00%	2.63%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	-3	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	208	211	0	-77	-3	0.0	3	210.0	213.0	213.0	69	97.37%	0.00%	2.63%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-76	-5	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	220	224	0	-76	-35	3.0	3	210.0	212.7	212.7	69	97.37%	0.00%	2.63%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-78	-24	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	105	0	-78	-24	0.0	3	210.0	209.5	209.5	69	97.37%	0.00%	2.63%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-79	-26	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	102	122	0	-79	-40	3.0	3	210.0	209.4	209.4	69	97.37%	0.00%	2.63%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-78	-18	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	115	128	0	-50	-18	3.0	3	210.0	209.6	209.6	69	97.37%	0.00%	2.63%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	-57	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	26	62	0	-81	-57	0.0	3	210.0	209.2	209.2	69	97.37%	0.00%	2.63%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-47	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	75	0	-80	-47	3.0	3	210.0	209.2	209.2	69	97.37%	0.00%	2.63%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-79	-67	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	241	0	-79	-67	3.0	3	210.0	210.3	210.3	69	97.37%	0.00%	2.63%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-79	-66	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	232	0	-30	-66	0.0	3	210.0	209.8	209.8	69	97.37%	0.00%	2.63%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-68	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	61	225	0	60	-68	0.0	3	210.0	209.4	209.4	69	97.37%	0.00%	2.63%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-54	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	81	0	0	85	3.0	3	210.5	219.4	219.4	69	97.37%	0.00%	2.63%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-61	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	66	0	70	87	3.0	3	210.6	219.1	219.1	69	97.37%	0.00%	2.63%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-61	89	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	67	67	0	-61	-45	3.0	3	210.9	219.1	219.1	69	97.37%	0.00%	2.63%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-54	88	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	50	0	-54	88	0.0	3	209.3	217.0	217.0	69	97.37%	0.00%	2.63%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-51	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	62	0	-51	-20	3.0	3	209.6	217.8	217.8	69	97.37%	0.00%	2.63%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-42	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	73	0	-42	50	3.0	3	209.4	216.9	216.9	69	97.37%	0.00%	2.63%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-1	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	113	113	0	0	90	3.0	3	210.0	216.6	216.6	69	97.37%	0.00%	2.63%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-3	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	99	99	0	50	90	3.0	3	210.0	216.1	216.1	69	97.37%	0.00%	2.63%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-18	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	93	93	0	-18	-70	0.0	3	209.8	216.1	216.1	69	97.37%	0.00%	2.63%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-16	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	171	171	0	-16	-30	0.0	3	209.8	219.0	219.0	69	97.37%	0.00%	2.63%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-11	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	188	188	0	-11	60	3.0	3	209.6	219.6	219.6	69	97.37%	0.00%	2.63%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	NS Barrier Angle 1 (degrees)	NS Barrier Angle 2 (degrees)	NS Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	18	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	235	253	0	18	76	3.0	3	209.6	232.7	232.7	265	91.47%	0.39%	8.14%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	18	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	223	240	0	18	0	0.0	3	209.6	231.4	231.4	265	91.47%	0.39%	8.14%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	15	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	229	243	0	15	-60	0.0	3	209.6	229.0	229.0	265	91.47%	0.39%	8.14%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	19	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	207	225	0	19	-55	0.0	3	209.6	230.2	230.2	265	91.47%	0.39%	8.14%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	30	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	152	186	0	30	78	0.0	3	209.6	224.0	224.0	265	91.47%	0.39%	8.14%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	26	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	164	192	0	26	-30	0.0	3	209.6	224.6	224.6	265	91.47%	0.39%	8.14%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	26	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	178	208	0	26	45	3.0	3	209.6	226.0	226.0	265	91.47%	0.39%	8.14%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	37	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	104	143	0	40	79	3.0	3	209.6	218.2	218.2	265	91.47%	0.39%	8.14%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	35	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	98	131	0	35	79	0.0	3	209.6	218.0	218.0	265	91.47%	0.39%	8.14%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	28	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	93	0	28	-40	0.0	3	209.6	211.9	211.9	265	91.47%	0.39%	8.14%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	32	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	79	104	0	32	70	3.0	3	209.6	212.9	212.9	265	91.47%	0.39%	8.14%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	51	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	61	112	0	51	81	3.0	3	209.6	212.4	212.4	265	91.47%	0.39%	8.14%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	55	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	104	0	80	81	3.0	3	209.6	211.5	211.5	265	91.47%	0.39%	8.14%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	75	87	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	188	0	75	-45	0.0	3	209.6	210.1	210.1	265	91.47%	0.39%	8.14%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	70	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	198	0	70	50	0.0	3	209.6	209.8	209.8	265	91.47%	0.39%	8.14%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	0	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	297	297	0	0	77	0.0	3	209.6	216.1	216.1	265	91.47%	0.39%	8.14%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-2	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	307	307	0	-2	-35	0.0	3	209.3	215.2	215.2	265	91.47%	0.39%	8.14%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-3	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	208	208	0	-3	81	0.0	3	209.3	213.0	213.0	265	91.47%	0.39%	8.14%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-5	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	220	220	0	-5	-35	0.0	3	209.2	212.7	212.7	265	91.47%	0.39%	8.14%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-24	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	88	0	-24	86	0.0	3	209.0	209.5	209.5	265	91.47%	0.39%	8.14%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-26	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	102	102	0	-26	-40	0.0	3	209.0	209.4	209.4	265	91.47%	0.39%	8.14%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-18	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	115	115	0	-18	50	3.0	3	209.0	209.6	209.6	265	91.47%	0.39%	8.14%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-57	88	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	26	26	0	-57	88	0.0	3	209.0	209.2	209.2	265	91.47%	0.39%	8.14%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-47	88	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	42	0	-47	-10	3.0	3	209.0	209.2	209.2	265	91.47%	0.39%	8.14%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-67	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	70	0	-67	0	3.0	3	210.8	210.3	210.3	265	91.47%	0.39%	8.14%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-66	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	72	0	-30	90	3.0	3	210.8	209.8	209.8	265	91.47%	0.39%	8.14%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-68	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	61	61	0	60	90	3.0	3	210.8	209.4	209.4	265	91.47%	0.39%	8.14%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	-54	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	146	0	0	-54	0.0	3	209.6	219.4	219.4	265	91.47%	0.39%	8.14%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	-61	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	146	0	70	-61	0.0	3	209.6	219.1	219.1	265	91.47%	0.39%	8.14%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-61	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	67	162	0	-84	-61	3.0	3	209.6	219.1	219.1	265	91.47%	0.39%	8.14%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-54	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	96	0	-84	-54	0.0	3	209.6	217.0	217.0	265	91.47%	0.39%	8.14%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-51	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	109	0	-84	-51	3.0	3	209.6	217.8	217.8	265	91.47%	0.39%	8.14%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-83	-42	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	109	0	-45	-42	3.0	3	209.6	216.9	216.9	265	91.47%	0.39%	8.14%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-74	-1	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	113	116	0	0	-1	0.0	3	209.6	216.6	216.6	265	91.47%	0.39%	8.14%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-73	-3	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	99	104	0	50	-3	0.0	3	209.6	216.1	216.1	265	91.47%	0.39%	8.14%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-18	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	93	103	0	-80	-70	3.0	3	209.6	216.1	216.1	265	91.47%	0.39%	8.14%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-16	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	171	182	0	-80	-30	3.0	3	209.6	219.0	219.0	265	91.47%	0.39%	8.14%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-80	-11	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	188	194	0	-55	-11	3.0	3	209.6	219.6	219.6	265	91.47%	0.39%	8.14%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	NS Barrier Angle 1 (degrees)	NS Barrier Angle 2 (degrees)	NS Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	18	75	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	224	238	0	18	75	3.0	3	209.6	232.7	232.7	113	96.00%	3.08%	0.92%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	18	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	213	226	0	18	0	0.0	3	209.6	231.4	231.4	113	96.00%	3.08%	0.92%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	11	71	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	218	228	0	11	-60	0.0	3	209.6	229.0	229.0	113	96.00%	3.08%	0.92%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	19	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	196	211	0	19	-55	0.0	3	209.6	230.2	230.2	113	96.00%	3.08%	0.92%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	32	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	141	173	0	32	78	0.0	3	209.6	224.0	224.0	113	96.00%	3.08%	0.92%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	28	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	154	178	0	28	-30	0.0	3	209.6	224.6	224.6	113	96.00%	3.08%	0.92%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	28	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	168	194	0	28	45	3.0	3	209.6	226.0	226.0	113	96.00%	3.08%	0.92%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	41	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	94	132	0	41	79	3.0	3	209.6	218.2	218.2	113	96.00%	3.08%	0.92%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	39	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	119	0	39	78	0.0	3	209.6	218.0	218.0	113	96.00%	3.08%	0.92%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	29	71	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	61	80	0	29	-40	0.0	3	209.6	211.9	211.9	113	96.00%	3.08%	0.92%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	33	72	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	68	92	0	33	70	3.0	3	209.6	212.9	212.9	113	96.00%	3.08%	0.92%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	58	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	104	0	58	81	3.0	3	209.6	212.4	212.4	113	96.00%	3.08%	0.92%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	63	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	41	97	0	63	82	3.0	3	209.6	211.5	211.5	113	96.00%	3.08%	0.92%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	75	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	184	0	75	-45	0.0	3	209.6	210.1	210.1	113	96.00%	3.08%	0.92%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	70	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	58	193	0	70	50	0.0	3	209.6	209.8	209.8	113	96.00%	3.08%	0.92%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	0	78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	281	281	0	0	78	0.0	3	209.6	216.1	216.1	113	96.00%	3.08%	0.92%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	0	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	291	291	0	0	-35	0.0	3	209.6	215.2	215.2	113	96.00%	3.08%	0.92%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	0	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	193	193	0	0	85	0.0	3	209.6	213.0	213.0	113	96.00%	3.08%	0.92%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-1	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	205	205	0	-1	-35	0.0	3	209.5	212.7	212.7	113	96.00%	3.08%	0.92%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-28	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	75	75	0	-28	86	0.0	3	209.1	209.5	209.5	113	96.00%	3.08%	0.92%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-30	86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	88	0	-30	-40	0.0	3	209.0	209.4	209.4	113	96.00%	3.08%	0.92%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-21	85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	101	101	0	-21	50	3.0	3	209.1	209.6	209.6	113	96.00%	3.08%	0.92%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-76	88	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	12	12	0	-76	88	0.0	3	209.1	209.2	209.2	113	96.00%	3.08%	0.92%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-59	88	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	29	29	0	-59	-10	3.0	3	209.0	209.2	209.2	113	96.00%	3.08%	0.92%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-71	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	62	62	0	-71	0	3.0	3	211.0	210.3	210.3	113	96.00%	3.08%	0.92%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-70	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	64	64	0	-70	90	3.0	3	211.8	209.8	209.8	113	96.00%	3.08%	0.92%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-72	90	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	54	0	-72	90	3.0	3	211.9	209.4	209.4	113	96.00%	3.08%	0.92%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-48	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	91	155	0	0	-48	0.0	3	209.6	219.4	219.4	113	96.00%	3.08%	0.92%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88	-58	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	154	0	70	-58	0.0	3	209.6	219.1	219.1	113	96.00%	3.08%	0.92%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	-61	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	75	169	0	-89	-61	3.0	3	209.6	219.1	219.1	113	96.00%	3.08%	0.92%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-83	-46	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	105	0	-83	-46	0.0	3	209.6	217.0	217.0	113	96.00%	3.08%	0.92%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-44	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	118	0	-84	-44	3.0	3	209.6	217.8	217.8	113	96.00%	3.08%	0.92%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-82	-37	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	83	119	0	-45	-37	3.0	3	209.6	216.9	216.9	113	96.00%	3.08%	0.92%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-10	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	127	132	0	0	-10	0.0	3	209.6	216.6	216.6	113	96.00%	3.08%	0.92%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-12	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	113	119	0	50	-12	0.0	3	209.6	216.1	216.1	113	96.00%	3.08%	0.92%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-19	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	105	117	0	-84	-70	3.0	3	209.6	216.1	216.1	113	96.00%	3.08%	0.92%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-82	-17	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	181	197	0	-82	-30	3.0	3	209.6	219.0	219.0	113	96.00%	3.08%	0.92%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	-15	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	199	210	0	-55	-15	3.0	3	209.6	219.6	219.6	113	96.00%	3.08%	0.92%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	EW Barrier Angle 1 (degrees)	EW Barrier Angle 2 (degrees)	EW Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT			
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 -74	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	56	252	0	-89	-74	3.0	3	209.6	232.7	232.7	265	91.47%	0.39%	8.14%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 -74	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	240	0	5	-74	0.0	3	209.6	231.4	231.4	265	91.47%	0.39%	8.14%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -77	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	42	242	0	-90	-77	0.0	3	209.6	229.0	229.0	265	91.47%	0.39%	8.14%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 -73	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	55	225	0	-89	-73	0.0	3	209.6	230.2	230.2	265	91.47%	0.39%	8.14%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 -60	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	80	185	0	30	-60	0.0	3	209.6	224.0	224.0	265	91.47%	0.39%	8.14%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 -64	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	192	0	-88	-64	0.0	3	209.6	224.6	224.6	265	91.47%	0.39%	8.14%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 -64	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	77	208	0	-88	-64	3.0	3	209.6	226.0	226.0	265	91.47%	0.39%	8.14%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -56	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	79	143	0	-60	-56	3.0	3	209.6	218.2	218.2	265	91.47%	0.39%	8.14%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -58	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	69	131	0	25	-58	0.0	3	209.6	218.0	218.0	265	91.47%	0.39%	8.14%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 -57	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	44	92	0	-88	-57	0.0	3	209.6	211.9	211.9	265	91.47%	0.39%	8.14%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 -54	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	103	0	-88	-54	3.0	3	209.6	212.9	212.9	265	91.47%	0.39%	8.14%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86 -37	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	84	112	0	-86	-37	3.0	3	209.6	212.4	212.4	265	91.47%	0.39%	8.14%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85 -32	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	82	104	0	0	-32	0.0	3	209.6	211.5	211.5	265	91.47%	0.39%	8.14%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86 -21	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	172	187	0	80	-21	0.0	3	209.6	210.1	210.1	265	91.47%	0.39%	8.14%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86 -25	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	174	197	0	-86	-45	3.0	3	209.6	209.8	209.8	265	91.47%	0.39%	8.14%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	82 87	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	296	0	82	-40	0.0	3	209.6	216.1	216.1	265	91.47%	0.39%	8.14%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	80 87	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	306	0	80	60	0.0	3	209.6	215.2	215.2	265	91.47%	0.39%	8.14%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	79 87	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	47	208	0	79	-50	0.0	3	209.6	213.0	213.0	265	91.47%	0.39%	8.14%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	77 86	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	56	221	0	77	60	0.0	3	209.6	212.7	212.7	265	91.47%	0.39%	8.14%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	51 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	53	96	0	51	-55	0.0	3	209.6	209.5	209.5	265	91.47%	0.39%	8.14%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	49 79	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	113	0	49	55	3.0	3	209.6	209.4	209.4	265	91.47%	0.39%	8.14%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	58 80	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	57	121	0	58	80	3.0	3	209.6	209.6	209.6	265	91.47%	0.39%	8.14%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	4 65	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	41	47	0	4	-50	0.0	3	209.6	209.2	209.2	265	91.47%	0.39%	8.14%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	20 71	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	62	0	20	70	3.0	3	209.6	209.2	209.2	265	91.47%	0.39%	8.14%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	1 74	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	222	225	0	1	60	3.0	3	209.6	210.3	210.3	265	91.47%	0.39%	8.14%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	2 74	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	212	216	0	2	45	3.0	3	209.6	209.8	209.8	265	91.47%	0.39%	8.14%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	0 74	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	207	210	0	0	74	0.0	3	209.6	209.4	209.4	265	91.47%	0.39%	8.14%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87 28	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	128	128	0	80	28	0.0	3	211.5	219.4	219.4	265	91.47%	0.39%	8.14%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87 21	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	137	137	0	-87	-55	3.0	3	210.6	219.1	219.1	265	91.47%	0.39%	8.14%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86 19	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	154	154	0	-86	19	3.0	3	210.6	219.1	219.1	265	91.47%	0.39%	8.14%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 25	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	87	87	0	-88	-30	3.0	3	209.9	217.0	217.0	265	91.47%	0.39%	8.14%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 29	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	96	96	0	-70	29	3.0	3	210.6	217.8	217.8	265	91.47%	0.39%	8.14%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 36	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	88	88	0	35	36	3.0	3	211.3	216.9	216.9	265	91.47%	0.39%	8.14%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 70	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	40	40	0	80	70	0.0	3	213.9	216.6	216.6	265	91.47%	0.39%	8.14%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 67	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	41	41	0	-90	67	0.0	3	212.6	216.1	216.1	265	91.47%	0.39%	8.14%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 59	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	54	54	0	-89	0	3.0	3	212.5	216.1	216.1	265	91.47%	0.39%	8.14%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84 68	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	78	78	0	-70	55	3.0	3	217.4	219.0	219.0	265	91.47%	0.39%	8.14%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85 73	2 Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	66	0	30	73	3.0	3	217.9	219.6	219.6	265	91.47%	0.39%	8.14%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	EW Barrier Angle 1 (degrees)	EW Barrier Angle 2 (degrees)	EW Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT				
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	52	249	0	-90	-78	3.0	3	210.0	232.7	232.7	69	97.37%	0.00%	2.63%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	237	0	5	-78	0.0	3	210.0	231.4	231.4	69	97.37%	0.00%	2.63%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	39	240	0	-90	-81	0.0	3	210.0	229.0	229.0	69	97.37%	0.00%	2.63%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 -77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	221	0	-90	-77	0.0	3	210.0	230.2	230.2	69	97.37%	0.00%	2.63%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85 -61	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	179	0	30	-61	0.0	3	210.0	224.0	224.0	69	97.37%	0.00%	2.63%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86 -66	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	67	186	0	-86	-66	0.0	3	210.0	224.6	224.6	69	97.37%	0.00%	2.63%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 -68	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	74	202	0	-88	-68	3.0	3	210.0	226.0	226.0	69	97.37%	0.00%	2.63%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86 -55	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	135	0	-60	-55	3.0	3	210.0	218.2	218.2	69	97.37%	0.00%	2.63%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86 -57	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	123	0	25	-57	0.0	3	210.0	218.0	218.0	69	97.37%	0.00%	2.63%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86 -63	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	33	86	0	-86	-63	0.0	3	210.0	211.9	211.9	69	97.37%	0.00%	2.63%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-85 -59	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	43	96	0	-85	-59	3.0	3	210.0	212.9	212.9	69	97.37%	0.00%	2.63%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-82 -38	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	101	0	-82	-38	3.0	3	210.0	212.4	212.4	69	97.37%	0.00%	2.63%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81 -33	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	93	0	0	-33	0.0	3	210.0	211.5	211.5	69	97.37%	0.00%	2.63%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-82 -19	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	160	174	0	80	-19	0.0	3	210.0	210.1	210.1	69	97.37%	0.00%	2.63%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-82 -24	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	164	184	0	-82	-45	3.0	3	210.0	209.8	209.8	69	97.37%	0.00%	2.63%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	79 86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	299	0	79	-40	0.0	3	210.0	216.1	216.1	69	97.37%	0.00%	2.63%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	77 86	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	309	0	77	60	0.0	3	210.0	215.2	215.2	69	97.37%	0.00%	2.63%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	74 85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	211	0	74	-50	0.0	3	210.0	213.0	213.0	69	97.37%	0.00%	2.63%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	72 85	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	224	0	72	60	0.0	3	210.0	212.7	212.7	69	97.37%	0.00%	2.63%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	45 79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	104	0	45	-55	0.0	3	210.0	209.5	209.5	69	97.37%	0.00%	2.63%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	44 80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	122	0	44	55	3.0	3	210.0	209.4	209.4	69	97.37%	0.00%	2.63%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	53 81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	128	0	53	81	3.0	3	210.0	209.6	209.6	69	97.37%	0.00%	2.63%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	7 75	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	57	61	0	7	-50	0.0	3	210.0	209.2	209.2	69	97.37%	0.00%	2.63%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	17 74	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	74	0	17	70	3.0	3	210.0	209.2	209.2	69	97.37%	0.00%	2.63%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	5 78	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	236	240	0	5	60	3.0	3	210.0	210.3	210.3	69	97.37%	0.00%	2.63%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	5 77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	226	230	0	5	45	3.0	3	210.0	209.8	209.8	69	97.37%	0.00%	2.63%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	5 80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	221	224	0	5	80	0.0	3	210.0	209.4	209.4	69	97.37%	0.00%	2.63%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 30	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	115	115	0	80	30	0.0	3	212.4	219.4	219.4	69	97.37%	0.00%	2.63%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87 23	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	123	123	0	-87	-55	3.0	3	211.6	219.1	219.1	69	97.37%	0.00%	2.63%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-87 20	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	140	140	0	-87	20	3.0	3	211.5	219.1	219.1	69	97.37%	0.00%	2.63%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 29	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	73	0	-89	-30	3.0	3	211.0	217.0	217.0	69	97.37%	0.00%	2.63%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 32	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	81	0	-70	32	3.0	3	211.6	217.8	217.8	69	97.37%	0.00%	2.63%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 40	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	74	74	0	35	40	3.0	3	212.2	216.9	216.9	69	97.37%	0.00%	2.63%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	27	27	0	80	76	0.0	3	215.0	216.6	216.6	69	97.37%	0.00%	2.63%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 74	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	27	27	0	-90	74	0.0	3	214.2	216.1	216.1	69	97.37%	0.00%	2.63%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90 65	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	40	40	0	-90	0	3.0	3	213.6	216.1	216.1	69	97.37%	0.00%	2.63%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89 67	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	71	71	0	-70	55	3.0	3	217.2	219.0	219.0	69	97.37%	0.00%	2.63%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-88 74	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	60	0	30	74	3.0	3	217.9	219.6	219.6	69	97.37%	0.00%	2.63%

POR	Posted Speed Limit (km/hr)	Road Grade (%)	Road Grade Mode	Road Pavement	Angle 1 (degrees)	Angle 2 (degrees)	Topography	Wood Depth	No of Row of Houses	Density of 1st Row	Intermediate Surface	Receptor Height (m)	Source-Receptor Perpendicular Distance	Source-Receptor Total Distance	Elevation Change	EW Barrier Angle 1 (degrees)	EW Barrier Angle 2 (degrees)	EW Barrier Height (m)	Barrier Receiver Distance (m)	Source Elevation (m)	Receiver Gnd Elevation (m)	Barrier Base Elevation (m)	# Vehicles	%Cars	%MT	%HT					
POR001a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-78	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	52	52	0	-78	50	3.0	3	219.8	232.7	232.7	32	97.56%	1.46%	0.98%
POR001b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-78	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	50	0	5	80	3.0	3	218.9	231.4	231.4	32	97.56%	1.46%	0.98%
POR001c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-81	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	39	39	0	-81	80	0.0	3	219.3	229.0	229.0	32	97.56%	1.46%	0.98%
POR002a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-77	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	51	51	0	-77	80	0.0	3	217.8	230.2	230.2	32	97.56%	1.46%	0.98%
POR003a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-61	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	76	0	30	82	3.0	3	214.2	224.0	224.0	32	97.56%	1.46%	0.98%
POR003b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-66	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	67	67	0	-66	82	0.0	3	215.1	224.6	224.6	32	97.56%	1.46%	0.98%
POR003c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-68	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	74	74	0	-68	-40	3.0	3	216.6	226.0	226.0	32	97.56%	1.46%	0.98%
POR004a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-55	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	70	0	-55	60	3.0	3	212.3	218.2	218.2	32	97.56%	1.46%	0.98%
POR004b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-57	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	60	0	25	80	3.0	3	211.8	218.0	218.0	32	97.56%	1.46%	0.98%
POR005a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-63	82	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	33	33	0	-63	82	0.0	3	210.5	211.9	211.9	32	97.56%	1.46%	0.98%
POR005b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-59	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	43	43	0	-59	25	3.0	3	210.7	212.9	212.9	32	97.56%	1.46%	0.98%
POR006a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-38	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	72	72	0	-38	25	3.0	3	210.4	212.4	212.4	32	97.56%	1.46%	0.98%
POR006b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-33	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	70	70	0	0	80	3.0	3	210.3	211.5	211.5	32	97.56%	1.46%	0.98%
POR007a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-19	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	160	160	0	80	76	0.0	3	210.4	210.1	210.1	32	97.56%	1.46%	0.98%
POR007b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-24	76	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	164	164	0	-24	-45	0.0	3	210.7	209.8	209.8	32	97.56%	1.46%	0.98%
POR008a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	50	0	-90	-40	3.0	3	222.3	216.1	216.1	32	97.56%	1.46%	0.98%
POR008b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	77	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	63	0	-70	60	3.0	3	222.9	215.2	215.2	32	97.56%	1.46%	0.98%
POR009a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	74	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	50	50	0	-90	-50	3.0	3	217.2	213.0	213.0	32	97.56%	1.46%	0.98%
POR009b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	72	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	59	59	0	-90	60	3.0	3	217.7	212.7	212.7	32	97.56%	1.46%	0.98%
POR010a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	45	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	63	0	-90	-55	3.0	3	210.5	209.5	209.5	32	97.56%	1.46%	0.98%
POR010b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	44	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	76	76	0	-65	44	3.0	3	210.9	209.4	209.4	32	97.56%	1.46%	0.98%
POR010c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	53	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	66	66	0	40	53	3.0	3	211.8	209.6	209.6	32	97.56%	1.46%	0.98%
POR011a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-89	7	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	57	57	0	-89	-50	3.0	3	210.0	209.2	209.2	32	97.56%	1.46%	0.98%
POR011b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-90	17	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	63	63	0	-65	17	3.0	3	210.0	209.2	209.2	32	97.56%	1.46%	0.98%
POR012a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	5	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	236	236	0	-30	5	3.0	3	210.0	210.3	210.3	32	97.56%	1.46%	0.98%
POR012b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-86	5	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	226	226	0	-30	5	3.0	3	210.0	209.8	209.8	32	97.56%	1.46%	0.98%
POR012c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	-84	5	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	221	221	0	-84	5	0.0	3	210.0	209.4	209.4	32	97.56%	1.46%	0.98%
POR013a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	30	73	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	115	142	0	80	73	0.0	3	210.0	219.4	219.4	32	97.56%	1.46%	0.98%
POR013b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	23	73	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	123	140	0	23	-55	0.0	3	210.0	219.1	219.1	32	97.56%	1.46%	0.98%
POR013c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	20	73	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	140	155	0	20	20	3.0	3	210.0	219.1	219.1	32	97.56%	1.46%	0.98%
POR014a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	29	72	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	73	93	0	29	-30	0.0	3	210.0	217.0	217.0	32	97.56%	1.46%	0.98%
POR014b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	32	73	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	81	106	0	32	60	3.0	3	210.0	217.8	217.8	32	97.56%	1.46%	0.98%
POR014c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	40	74	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	74	109	0	40	74	3.0	3	210.0	216.9	216.9	32	97.56%	1.46%	0.98%
POR015a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	76	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	27	129	0	80	81	3.0	3	210.0	216.6	216.6	32	97.56%	1.46%	0.98%
POR015b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	74	81	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	27	116	0	74	81	0.0	3	210.0	216.1	216.1	32	97.56%	1.46%	0.98%
POR015c	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	65	79	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	40	112	0	65	0	0.0	3	210.0	216.1	216.1	32	97.56%	1.46%	0.98%
POR016a	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	67	80	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	71	192	0	67	55	0.0	3	210.0	219.0	219.0	32	97.56%	1.46%	0.98%
POR016b	60	0.0%	2	Manual	1	Typical Asphalt or Concrete	74	83	2	Flat/gentle slope; with barrier	0	None, or < 30 m woods	0	95%	2	Reflective Ground	1.50	60	206	0	74	83	3.0	3	210.0	219.6	219.6	32	97.56%	1.46%	0.98%

APPENDIX D

ORNAMENT Results

1664714 Albion Vaughan and King Road Noise Impact Study - Prediction Modelling Results

OLA	2017 L _{eq,16hr} (dBA)	2037 Without Project L _{eq,16hr} (dBA)	2037 With Project L _{eq,16hr} (dBA)	Change in Noise Level between 2017 and 2037 with Project (dB)	Change in Noise Level between 2037 without Project and 2037 with Project (dB)
POR001a	53.8	55.0	55.0	1.2	0.0
POR001b	58.9	60.1	60.1	1.2	0.0
POR001c	61.4	62.5	62.5	1.2	0.0
POR002a	60.6	61.8	61.8	1.2	0.0
POR003a	59.6	60.7	60.7	1.2	0.0
POR003b	60.1	61.3	61.3	1.2	0.0
POR003c	57.6	58.7	58.7	1.1	0.0
POR004a	57.9	59.0	59.0	1.2	0.0
POR004b	60.9	62.1	62.1	1.1	0.0
POR005a	63.2	64.3	64.3	1.2	0.0
POR005b	57.5	58.7	58.7	1.1	0.0
POR006a	57.5	58.7	58.6	1.1	0.0
POR006b	61.9	63.1	63.1	1.1	0.0
POR007a	60.5	61.6	61.6	1.2	0.0
POR007b	57.0	58.2	58.2	1.1	0.0
POR008a	59.8	60.9	60.9	1.1	0.0
POR008b	56.9	58.1	58.0	1.1	0.0
POR009a	60.6	61.8	61.7	1.1	0.0
POR009b	57.5	58.7	58.7	1.1	0.0
POR010a	62.9	64.1	64.1	1.1	0.0
POR010b	61.0	62.2	62.1	1.1	0.0
POR010c	59.4	60.5	60.5	1.1	0.0
POR011a	68.9	70.0	69.9	1.1	-0.1
POR011b	63.6	64.8	64.7	1.1	-0.1
POR012a	60.5	61.7	61.7	1.1	0.0
POR012b	58.4	59.6	59.6	1.2	0.0
POR012c	63.1	64.2	64.2	1.1	0.0
POR013a	60.6	61.8	61.8	1.2	0.0
POR013b	60.6	61.8	61.8	1.2	0.0
POR013c	57.0	58.2	58.2	1.1	0.0
POR014a	62.1	63.2	63.2	1.2	0.0
POR014b	57.6	58.7	58.7	1.2	0.0
POR014c	61.8	63.0	63.0	1.2	0.0
POR015a	66.0	67.2	67.0	1.0	-0.2
POR015b	66.0	67.2	67.1	1.1	-0.2
POR015c	62.3	63.5	63.4	1.1	-0.1
POR016a	57.5	58.7	58.6	1.1	-0.1
POR016b	61.7	62.9	62.7	1.1	-0.2

APPENDIX E

STAMSON Sample Calculation

Filename: Time Period: 1 hours
Description: OLA POR016b; Future with Project

Road data, segment # 1: S08

Car traffic volume : 343 veh/TimePeriod
Medium truck volume : 0 veh/TimePeriod
Heavy truck volume : 4 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: S08

Angle1 Angle2 : -84.00 deg 75.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 66.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 30.00 deg Angle2 : 75.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 3.00 m
Source elevation : 217.86 m
Receiver elevation : 219.61 m
Barrier elevation : 219.61 m
Reference angle : 0.00

Road data, segment # 2: S09

Car traffic volume : 263 veh/TimePeriod
Medium truck volume : 0 veh/TimePeriod
Heavy truck volume : 3 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: S09

Angle1 Angle2 : -88.00 deg 74.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)

Receiver source distance : 60.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 30.00 deg Angle2 : 74.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 3.00 m
Source elevation : 217.90 m
Receiver elevation : 219.61 m
Barrier elevation : 219.61 m
Reference angle : 0.00

Road data, segment # 3: S10

Car traffic volume : 286 veh/TimePeriod
Medium truck volume : 1 veh/TimePeriod
Heavy truck volume : 27 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: S10

Angle1 Angle2 : -84.00 deg 76.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 62.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 30.00 deg Angle2 : 76.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 3.00 m
Source elevation : 217.98 m
Receiver elevation : 219.61 m
Barrier elevation : 219.61 m
Reference angle : 0.00

Road data, segment # 4: S18

Car traffic volume : 243 veh/TimePeriod
Medium truck volume : 1 veh/TimePeriod
Heavy truck volume : 22 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: S18

Angle1 Angle2 : -85.00 deg 73.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 66.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 30.00 deg Angle2 : 73.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 3.00 m
Source elevation : 217.85 m
Receiver elevation : 219.61 m
Barrier elevation : 219.61 m
Reference angle : 0.00

Road data, segment # 5: S19

Car traffic volume : 67 veh/TimePeriod
Medium truck volume : 0 veh/TimePeriod
Heavy truck volume : 2 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 5: S19

Angle1 Angle2 : -88.00 deg 74.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 60.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 30.00 deg Angle2 : 74.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 3.00 m
Source elevation : 217.89 m
Receiver elevation : 219.61 m
Barrier elevation : 219.61 m
Reference angle : 0.00

Results segment # 1: S08

Source height = 1.04 m

Barrier height for grazing incidence

```
-----
Source   ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
      1.04 !    1.50 !    1.40 !    221.01
```

ROAD (53.22 + 37.62 + 0.00) = 53.34 dBA

```
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-84   30   0.00 61.64  0.00 -6.43 -1.98  0.00  0.00  0.00 53.22
-----
 30   75   0.00 61.64  0.00 -6.43 -6.02  0.00  0.00 -11.57 37.62
-----
```

Segment Leq : 53.34 dBA

Results segment # 2: S09

Source height = 1.03 m

Barrier height for grazing incidence

```
-----
Source   ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
      1.03 !    1.50 !    1.39 !    221.00
```

ROAD (52.60 + 36.61 + 0.00) = 52.71 dBA

```
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-88   30   0.00 60.45  0.00 -6.02 -1.83  0.00  0.00  0.00 52.60
-----
 30   74   0.00 60.45  0.00 -6.02 -6.12  0.00  0.00 -11.70 36.61
-----
```

Segment Leq : 52.71 dBA

Results segment # 3: S10

Source height = 1.71 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.71	1.50	1.43	221.04

1.71	1.50	1.43	221.04
------	------	------	--------

ROAD (58.28 + 42.98 + 0.00) = 58.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	30	0.00	66.42	0.00	-6.16	-1.98	0.00	0.00	0.00	58.28
30	76	0.00	66.42	0.00	-6.16	-5.93	0.00	0.00	-11.35	42.98

Segment Leq : 58.40 dBA

Results segment # 4: S18

Source height = 1.70 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.70	1.50	1.43	221.04

1.70	1.50	1.43	221.04
------	------	------	--------

ROAD (57.19 + 41.35 + 0.00) = 57.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	30	0.00	65.57	0.00	-6.43	-1.95	0.00	0.00	0.00	57.19
30	73	0.00	65.57	0.00	-6.43	-6.22	0.00	0.00	-11.57	41.35

Segment Leq : 57.31 dBA

Results segment # 5: S19

Source height = 1.30 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.30	1.50	1.40	221.01

1.30	1.50	1.40	221.01
------	------	------	--------

ROAD (48.64 + 32.72 + 0.00) = 48.75 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-88	30	0.00	56.50	0.00	-6.02	-1.83	0.00	0.00	0.00	48.64
-----	----	------	-------	------	-------	-------	------	------	------	-------

30	74	0.00	56.50	0.00	-6.02	-6.12	0.00	0.00	-11.64	32.72
----	----	------	-------	------	-------	-------	------	------	--------	-------

Segment Leq : 48.75 dBA

Total Leq All Segments: 62.32 dBA

TOTAL Leq FROM ALL SOURCES: 62.32



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