

**REGIONAL
MUNICIPALITY OF
WATERLOO**

**IMPLEMENTATION
GUIDELINE FOR
NOISE POLICIES**

FINAL

JULY 14,1999

REGIONAL MUNICIPALITY OF WATERLOO
IMPLEMENTATION GUIDELINE FOR NOISE POLICIES

PART A

**NEW DEVELOPMENT IMPACTED BY
NOISE FROM ROADS AND RAILWAYS**

PREAMBLE

The Regional and Area Municipalities recognize that excessive noise levels generated by roads and railways are an environmental concern that must be addressed through the planning and development application processes. The preferred approach is the use of passive noise mitigation measures such as:

- *increased building setbacks;*
- *residential front lotting;*
- *neo-traditional street layout and design; and*
- *buffering with noise insensitive land uses.*

The use of such measures rather than noise barriers is encouraged in order to support improved community safety and pedestrian access, and to reduce noise barrier maintenance costs. However, the final selection of appropriate noise attenuation measures in each situation needs to be balanced with other development and design considerations. This approach is supported by the municipalities' planning documents, development application procedures, special policies, and this Implementation Guideline.

1. PURPOSE

- 1.1 The purpose of Part A of the Implementation Guideline is to state the details of how Policies 11.9.1 to 11.9.3 in the Regional Official Policies Plan will be implemented. This Implementation Guideline describes the process of assessing noise impacts, the responsibilities of the various parties, and the procedure for implementing noise attenuation requirements.
- 1.2 Chapter 11, "Transportation Opportunities" of the Regional Official Policies Plan (1996) contains the following policies concerning the impact of noise from roads and railways on new residential development:

- 11.9.1 The Noise Criteria shown in Table 11.1 of this Plan will be applied when assessing the noise impact of Existing Roads, or Planned Roads or railways on noise sensitive land uses proposed in any development application.

TABLE 11.1

Noise Criteria for Noise Sensitive Land Uses

Receiver Category	Time Period	Road Traffic	Rail Traffic
Outdoor Living Area	0700 - 2300	Leq = 55 dBA	Leq = 55 DBA
Indoor Living Area	0700 - 2300	Leq = 45 dBA	Leq = 40 dBA
Indoor Living Area (Sleeping Quarters)	2300 - 0700	Leq = 40 dBA	Leq = 35 dBA

**Leq means average sound level
dBA is a unit of measurement for sound levels**

- 11.9.2 Where projected noise levels exceed the Noise Criteria shown in Table 11.1, appropriate warning and/or attenuation measures will be required as a condition of development application approval and in accordance with the Regional Implementation Guideline relating to noise mitigation. Such measures may include site design and building layout, noise warning clauses, noise attenuation barriers, air conditioning, and/or structural design measures such as multiple glazing and brick wall construction. Notwithstanding the above, noise sensitive land uses will be prohibited where the projected attenuated daytime noise level in the associated outdoor recreation area exceeds 70 DBA.
- 11.9.3 The Region will require consideration of passive noise mitigation measures during the preparation of development applications as a means of reducing the use of structural mitigation measures such as noise barriers.

2. **SCOPE AND RESPONSIBILITY**

2.1 This Implementation Guideline applies to the following noise sources:

- Existing or Planned Regional Roads
- Arterial and Major Collector roads under jurisdiction of an Area Municipality
- Provincial Highways
- Railways

2.2 This Implementation Guideline does not apply to other noise sources such as air traffic, rail yards, industrial or commercial activities. Where new noise sensitive development is impacted by such noise sources, the noise levels must be assessed separately from road and rail impacts in accordance with MOE guidelines such as LU-131, "Noise Assessment Criteria in Land Use Planning" (as amended). Required mitigation measures will take into account noise from all sources.

2.3 This Implementation Guideline applies when new noise sensitive development is proposed through Official Plan Amendments, Secondary or Community Plans, Plans of Subdivision, or other development applications reviewed or approved by the Region.

- 2.4 Responsibility for ensuring that new noise sensitive development is not adversely affected by anticipated noise impacts from nearby road and rail sources has been transferred to the Regional Municipality by the Ministry of the Environment (MOE). The noise level criteria and attenuation measures detailed in this Implementation Guideline are generally consistent with criteria established by MOE through publication LU-131 (as amended). This guideline will apply in cases where it is more specific than MOE guidelines.
- 2.5 Proponents of new noise sensitive development are, in general, responsible for:
- assessing future noise impacts on the proposal from all nearby noise sources;
 - preparing development proposals which avoid the use of noise barriers wherever possible;
 - submitting the appropriate studies and information;
 - ensuring that the required noise control measures are incorporated into the plans and built accordingly;
 - contributing to a Regional barrier replacement fund for the future replacement of the noise wall, if one is required on Regional property; and
 - certifying that the required noise control measures have been built in accordance with the agreements with the Region and/or Area Municipality.
- 2.6 The noise consultant is responsible for: obtaining current information; applying professional expertise in performing calculations, making detailed and justified recommendations; and submitting the Consultant Noise Study Declaration and Owner/Authorized Agent Statement with the Noise Study.
- 2.7 The Region is responsible for: commenting on the need to assess noise impacts; determining whether proposed noise attenuation measures are acceptable to the Region; and implementing such measures through appropriate conditions of approval.
- 2.8 The Area Municipality is responsible for: commenting on the acceptability of proposed noise attenuation measures with respect to Area Municipal policies; and implementing such measures through appropriate conditions of approval where the noise source is not a Regional road.

3. **DEFINITIONS AND METHODOLOGY**

3.1 **Noise Prediction**

- 3.1.1 Noise levels must be calculated using procedures approved by the Ministry of the Environment and Energy.
- 3.1.2 Calculations are done for both the Daytime (7 am to 11 pm) and Nighttime (11 pm to 7 am) periods. The daily traffic volume is apportioned to these periods based on the type of noise source.

- 3.1.3 Road traffic forecasts and truck percentages for Regional roads should be obtained from the Regional Engineering Department, Corridor Planning. Provincial and Area Municipal road data may also be available from Regional Engineering, or the specific agency may have to be contacted.
- 3.1.4 Where the noise source is an adjacent rail line, the typical train configuration (number of cars and engines) and projected frequency of movements as determined by the category of the rail line, the existing use and expected future use, are used. The appropriate railway authority should be contacted for the information.
- 3.1.5 Where new noise sensitive development is impacted by road and rail noise, the noise levels will be combined prior to determining noise control measures.
- 3.1.6 For the purpose of Tables A-2 and A-3, the projected indoor noise level is defined to be 10 dBA less than the noise level calculated at the exterior plane of the window. The rail noise criteria for Living Areas are used only for the determination of building component requirements (Table A-3).

3.2 Noise Sensitive Uses

- 3.2.1 Noise Sensitive Land Uses: Uses which may be adversely impacted by noise from transportation sources, including residential developments, seasonal residential developments, and hospitals, nursing/retirement homes, schools and day-care centres.
- 3.2.2 Outdoor living area: An outdoor amenity area where the enjoyment of the outdoor environment is important. Such areas may include:
- the backyard or patio within 3 metres of the rear wall of a residential unit, or the recreational area designated on the development application;
 - the common outdoor area allocated for recreational purposes outside residential buildings such as apartments or condominiums;
 - balconies (see below); and
 - parks and open spaces identified by the Area Municipality for passive recreation purposes within a plan of subdivision.

The minimum outdoor area recommended by MOE for noise control purposes is:

- single family - 56 square metres (600 square feet)
 - semi-detached - 46 square metres (500 square feet)
 - townhouse - 37 square metres (400 square feet)
- 3.2.3 Balconies are considered part of the outdoor living area where they are the only outdoor living area for the occupant and meet the following conditions:
- depth greater than 4 metres;
 - outside the exterior building facade; and
 - unenclosed.

3.2.4 Indoor living area: An area within the housing unit where the enjoyment of quiet conversation and sleeping is important. It includes:

- living rooms (assumed to be at ground level for single detached, semi-detached and town houses);
- sleeping quarters (assumed to be on the second floor for single detached, semi-detached and town houses, unless otherwise indicated);
- the living rooms and sleeping quarters for each floor of a multi-storey building.

3.3 Required Noise Control Measures

- 3.3.1 Where the projected noise level exceeds the daytime or nighttime Noise Criteria (also called Regional Noise Level Objectives) shown in Table 11-1 of the ROPP, the required noise control measures are stated in Tables A-1, A-2 and A-3, and further defined below. Note that, in order to account for the special characteristics of railway sound (high pass-by sound level for short periods, and major low frequency component) the indoor sound level criteria for rail are used to determine building component requirements. Whistle noise is excluded in the determination of projected rail noise when assessing outdoor, ventilation, and noise warning clause requirements, but included when assessing building component requirements.
- 3.3.2 Noise Warning Clause: Since sensitivity to noise varies among individuals, the projected noise level may be allowed to exceed the noise level objective by up to 5 dBA without attenuation provided that a clause warning future occupants of the potential noise concern is included in the Regional or Area Municipal Development Agreement whereby the owner agrees to advise future owners or tenants through all offers of purchase and sale, and rental agreements.
- 3.3.3 Passive Noise Control Measures: Measures which do not require the construction of a noise barrier (wall and/or berm) to provide attenuation. These include noise insensitive land uses, road/lot configuration, and building design. Area Municipalities may differ on the extent to which passive noise control measures must be pursued.
- 3.3.4 Active Noise Control Measures: These are considered to be acoustic walls and/or berms, which are collectively referred to as noise barriers. Noise barriers located along the road right-of-way are not the preferred method of noise control. Area Municipalities may choose to restrict the use of noise barriers for noise control and require the use of passive noise control measures instead. Where a noise barrier is required, the Daytime noise level in the Outdoor Living Area must be attenuated to 60 dBA or less.
- 3.3.5 Provision for air conditioning: Units with this requirement must be designed to allow future occupants to install central air conditioning which will provide alternative ventilation if windows must be closed to reduce interior noise levels. In general, a forced air ducted heating system suitably sized and designed to permit the future installation of a central air conditioning system by the occupant is required. A sentence will be added to the Noise Warning Clause to notify future occupants of this provision. The provision for, or installation of, window or through-the-wall box air conditioners is not generally acceptable as a means of satisfying the requirement for air conditioning.

- 3.3.6 Central air conditioning or provision of alternate ventilation: Central air conditioning is required where projected interior noise levels are more than 10 dBA in excess of the noise level objectives, so that windows may be closed to provide effective noise attenuation.

However, where central air conditioning or provision for central air conditioning is required, the Proponent may propose an alternative means of mechanical ventilation, provided that it is specified in the Noise Study, and that the Study includes an assessment of the proposed system. In such cases, the Study will:

- a) describe the proposed ventilation system and indicate that the system will provide an acceptable environment within the dwelling units to the satisfaction of the Area Municipality;
- b) provide assurance that the system as approved by the Area Municipality will meet all relevant codes and standards;
- c) certify that the system will not have any adverse effect on the acoustical environment of the dwelling units, and that it will allow the windows to remain closed; and
- d) demonstrate that the installation of, or provision for, central air conditioning is not feasible for economic or other reasons.

Where a relatively complex or unusual ventilation system is proposed, it is necessary to have a specialist in the field of heating ventilation and air conditioning design the system and sign the Report.

- 3.3.7 Building components designed to achieve indoor sound level criteria: Special wall, window and door construction that exceeds Ontario Building Code specifications may be required as determined by the Acoustic Insulation Factor (AIF) or Sound Transmission Class (STC). The recommendations must comply with local regulations; it should be clearly stated how the recommendations differ from Ontario Building Code requirements.

- 3.3.8 Brick veneer (EW5) or acoustical equivalent is required for the exterior wall (facing the rail line) of the first row of dwellings adjacent to the rail line if they are within 100 m of the rail line and the Leq(24) at the plane of the bedroom window exceeds 60 dBA.

3.4 **Other**

- 3.4.1 Regional Development Agreement: An Agreement between the Proponent and the Region, registered on title, prepared by the Region at the expense of the Proponent.

- 3.4.2 Proponent: Person / group / company seeking approval to develop a specific property.

- 3.4.3 Noise Study: Determination of the extent and type of noise attenuation measures.

TABLE A-1: NOISE CONTROL REQUIREMENTS FOR OUTDOOR LIVING AREAS

Projected Outdoor Noise Level		Exceeds Objective By	Noise Control Measures
Daytime - Leq(16)* (0700 - 2300)			
56-60 dBA		1-5 dBA	<ul style="list-style-type: none"> • Noise Warning Clause (NWC) (Policy 6.1)
61+ dBA		6+ dBA	<ul style="list-style-type: none"> • Alternative Land Use • Alternative Draft Plan Designs • Barriers • Possible NWC in conjunction with other measures (Policy 6.1,6.2)

TABLE A-2: VENTILATION REQUIREMENTS FOR INDOOR LIVING AREAS

Projected Indoor Noise Level**		Exceeds Objective By	Noise Control Measures
Daytime -Leq(16)* (0700-2300)	Nighttime -Leq(8)* (2300-0700)		
46-55 dBA	41-50 dBA	1-10 dBA	<ul style="list-style-type: none"> • Provision for air conditioning; NWC (Policy 6.1,6.2)
56+ dBA	51+ dBA	10+ dBA	<ul style="list-style-type: none"> • Central A/C or other ventilation system installed prior to occupancy; NWC (Policy 6.1,6.3)

TABLE A-3: BUILDING COMPONENT REQUIREMENTS

Projected Indoor Noise Level**		Exceeds Objective By	Noise Control Measures
Daytime -Leq(16)* (0700-2300)	Nighttime -Leq(8)* (2300-0700)		
Road: 46-55 dBA Rail: 41-50 dBA	41-50 dBA 36-45 dBA	1-10 dBA	<ul style="list-style-type: none"> • Compliance with Ontario Building Code; also see Policy 3.3.8
Road: 56+ dBA Rail: 51+ dBA	51+ dBA 46+ dBA	10+ dBA	<ul style="list-style-type: none"> • Building components designed to achieve indoor sound level criteria; NWC (Policy 6.1,6.3); also see 3.3.8
<i>Include whistle noise in rail noise calculation.</i>			

* Projected noise levels to be rounded to nearest whole number.

** Defined as 10 dBA less than noise level calculated at exterior plane of window.

4. **PRELIMINARY NOISE ASSESSMENT**

4.1 Consideration of potential noise problems must commence as early as possible in the planning process with the objective of providing noise attenuation without the use of noise barriers.

4.2 **Official Plan Amendments for Land Use Change**

4.2.1 Potential noise problems which may result from a proposed change in land use must be identified during consideration of the Official Plan Amendment.

4.2.2 The Area Municipality will address the identified noise issue(s) and include specific provisions in the OPA or Zoning By-law as deemed appropriate.

4.2.3 The Region will review and comment on these provisions prior to approval of the Official Plan Amendment and/or Zoning By-law.

4.3 **Secondary and Community Plans**

4.3.1 Secondary Plans provide further policy concerning development in a specific area, and are adopted through an Official Plan Amendment. Community Plans include District, Neighbourhood Plans, Concept and Implementation Plans, and may be adopted by Area Municipal Council; such Plans can not introduce new policy. Potential noise concerns must be addressed during the development of such Plans so that the need for noise barriers in individual applications is eliminated or reduced.

4.3.2 The Region will identify potential noise concerns when advised by the Area Municipality of the initiation of the Secondary or Community Plan process. Technical details appropriate to the long-term nature of the Plan, such as long-term road traffic volumes and noise contours will be provided.

4.3.3 The Area Municipality will determine an acceptable community design, taking into account noise sources and Area Municipal policies or design guidelines concerning acceptable attenuation measures. Land use arrangements, unit types, street layout, and other measures which mitigate noise levels and reduce the future need for noise barriers will be encouraged, although it is recognized that in some limited circumstances a noise barrier may be the most acceptable alternative. The Area Municipality may include policies specifically addressing such noise attenuation measures in Secondary, District or Community Plans.

4.3.4 The Region will review and comment on the suitability of proposed noise attenuation measures prior to Area Municipal adoption of the Secondary or Community Plan.

4.4 **Subdivision Applications**

- 4.4.1 The Proponent must consider the impact of all potential noise sources on the development as a factor in determining the design of the plan, with the objective of providing noise attenuation without the use of physical barriers.
- 4.4.2 At the Pre-consultation Meeting, the Region will identify potential noise sources and advise the Proponent of the technical review and submission requirements. The Area Municipality will define the range of acceptable noise attenuation alternatives, based on Official Plan policies, the Community Plan, or approved Design Guidelines.
- 4.4.3 If identified at the Pre-consultation Meeting, the Proponent will submit a Noise Study for all potentially affected lands in conjunction with the Planning Report submitted with the application for Draft Approval. Noise Study submission and processing details are provided in Section 5.
- 4.4.4 It is recognized that , at the Draft Plan stage, some data used in the noise calculation (grades, receiver location, etc.) may require assumptions to be made, and as a result the recommended noise attenuation measures may be stated in general terms. It is the responsibility of the Proponent to ensure that the Noise Study is updated as necessary to reflect more accurate or revised information when it is available.
- 4.4.5 Conditions of Draft Plan Approval will include the noise attenuation measures identified in the Noise Study (including the identification of such elements as setback from noise source, unit type, road layout, etc. that contribute to noise attenuation). An updated Noise Study may be required prior to Registration to take into account final lot grading, drainage and other details.
- 4.4.6 For multiple unit residential Blocks, the conditions of Draft Plan Approval will require the developer to enter into a Registered Agreement with the Region, requiring that an updated Noise Study specific to the Block be completed and submitted to the Region for review and comment prior to site plan approval and issuance of a building permit. The developer may be required to enter into a supplementary agreement to implement the specific recommendations of the updated Noise Study.

4.5 **Consent Applications**

- 4.5.1 For consent applications involving noise sensitive uses, the Region will determine whether there is a potential concern related to noise from roads or railways.
- 4.5.2 Where a potential noise concern is identified, the Region will request that a Noise Study and implementation methods be required as a condition of the Consent. However, where it may not be feasible to attenuate the noise levels if the Consent were granted, the Region will request that a Noise Study be submitted by the Proponent prior to consideration of the Consent application.

- 4.5.3 The Region will notify the Area Municipality of the requirement for a Noise Study. The Area Municipality may decide to recommend against granting of the Consent Application if the anticipated noise attenuation measures would not be acceptable to the Area Municipality.
- 4.5.4 The Proponent may request deferral of the Consent Application in order to provide more detailed information to the Region to demonstrate that a Noise Study should not be required.
- 4.5.5 The results of the Noise Study will be implemented through an agreement between the proponent and the Region or the Area Municipality, as detailed in Section 5.

4.6 Zone Change Applications

- 4.6.1 For zone change applications involving noise sensitive uses, the Region will determine whether there is a potential concern related to noise from roads or railways.
- 4.6.2 Where a potential noise concern is identified, the Region may advise the Area Municipality that consideration of the application is premature and in conflict with the Regional Official Policies Plan until the matter of noise identification and mitigation has been addressed through the completion of a Noise Study. The area municipality will also be requested to comment on the proposed noise mitigation measures prior to final recommendations from the Region.
- 4.6.3 Area Municipal staff may recommend against approval of the Zone Change Application if the anticipated noise attenuation measures would not be acceptable to the Area Municipality.

4.7 Condominium Applications

- 4.7.1 All applications for Plan of Condominium approval will be reviewed to determine potential concerns related to noise from roads or railways. However, it is recognized that the range of feasible noise attenuation measures may be limited in the case of existing, or substantially complete, buildings.
- 4.7.2 The need to consider noise impacts may in some instances have been identified by the Region in its comments on the site plan application, or may be set out in registered agreement that implemented a prior Zone Change or Plan of Subdivision application.
- 4.7.3 Where a new multi-residential development is planned, and a future condominium application is anticipated, proponents are strongly encouraged to avail themselves of the Region's Implementation Guideline for Noise Policies so that the site and buildings are designed taking into account the need to mitigate potential road and rail noise impacts. This will avoid the possibility of having to redesign or retrofit the site or buildings to implement noise mitigation measures that may be identified during the review of the Plan of Condominium application.

5. NOISE STUDY REQUIREMENTS

- 5.1 The Noise Study must be prepared by a consultant who is currently registered on the Region's Prequalified Consultants for Noise Studies List. If the Noise Study was not prepared by a Prequalified consultant, the consultant's declaration must be co-signed by a consultant who is registered on the List.
- 5.2 An individual noise consultant will be included on the Prequalified Consultants for Noise Studies List upon the acceptance by the Regional Commissioner of Engineering of the following:
- Certificate showing that the individual has successfully completed a Ministry of Environment (MOE) course in Acoustical Technology in Land Use Planning, or its equivalent;
 - Sample of two substantive Noise Studies completed by the individual within the last two years, preferably for sites in Waterloo Region, demonstrating knowledge of appropriate study content, calculation methods, and noise attenuation recommendations;
 - Thorough knowledge of Regional and Area Municipal noise policies, usually demonstrated by attending a seminar or interview with Regional staff;
 - Proof that the individual is a Professional Engineer (P.Eng.), Registered Professional Planner (R.P.P.) or is an employee of a Firm that holds a Certificate of Authorization license from Professional Engineers Ontario (PEO); and
 - Proof of Professional Liability Insurance carried by the consultant in an amount satisfactory to the Region, as amended from time to time.

It is the responsibility of the individual consultant to advise the Region of any change in status related to the above qualifications.

- 5.3 A consultant will be deleted from the Prequalified Consultants for Noise Studies List for a period of two years if a peer review of the consultant's work finds substantive deficiencies. The peer review would be initiated by Regional staff, based on concerns about technical competence, quality or sufficiency of the Noise Study. If the review finds substantive deficiencies, the original consultant will be invoiced for the cost of the review.
- 5.4 The Noise Study must include or be accompanied by a Statutory Declaration (see format in Appendix A) signed by the Consultant, making the following statements:
- I am a (Professional Engineer/Registered Professional Planner/employed by <name of Firm> which holds a Certificate of Authorization) and have personal knowledge of the matters set out below.
 - I was retained or employed as the principal consultant to undertake the assessment of noise impacts and recommendation of noise mitigation measures for the property described as municipal address/development application number/other identifier in the municipality of _____ .

- I had the expertise required to perform these services. Any assessment activities or recommendations requiring the application of engineering principles have been undertaken or supervised by an engineer qualified to perform such services.
 - The information used in the study entitled (name of study) dated _____ is the best available information as of the date of the study.
 - The noise level calculations, the interpretation of noise attenuation requirements, and the recommended measures are in accordance with Ministry of Environment and Energy Guidelines, Region of Waterloo policies, and any applicable policy or guidelines of the Area Municipality, and any other applicable policy or guideline.
 - The physical noise attenuation measures proposed in this study are feasible to implement and will provide the level of attenuation indicated in the study.
 - I acknowledge that this study may be subject to a peer review conducted at my cost.
 - I acknowledge that public authorities and future owners, occupants and others may rely on this statement.
- 5.5 The Noise Study must include or be accompanied by a statement signed and dated by the owner of the property or the authorized agent, stating that:
- I am the owner of the property, or the owner's agent, and that I understand and agree with the noise attenuation measures proposed in study entitled (name of study) dated _____.
 - The application has been designed to avoid the use of berms or walls as noise attenuation features where feasible. Where berms or walls are recommended, the Noise Study provides economic, planning and engineering justification.
 - If the application is changed in a way that may affect the noise level calculations, I will have a revised noise study submitted to the Region.
- 5.6 Where a Noise Study is required under the Preliminary Noise Assessment policies of Section 4 for a Subdivision, Consent, Zone Change or Condominium Application, a 10 year traffic volume forecast will be used. For Subdivision Applications, the traffic volume forecast need not be revised in subsequent refinements of the Noise Study, provided that registration occurs within 5 years of the initial preparation (see Policy 5.12).
- 5.7 Where a Noise Study is required under the Preliminary Noise Assessment policies of Section 4 for an Official Plan Amendment or Secondary/Community Plan, the appropriate forecast period will be determined by Regional staff, in consultation with Area Municipal staff as necessary.
- 5.8 The Noise Study must include:
- the reason it is being submitted, any applicable conditions of development approval and the development application reference numbers for the site;

- scale plan identifying road and rail noise sources (within 200 metres; 500 metres for Provincial Highways and stationary noise sources) as well as all other noise sources affecting the proposed development (the Proponent is responsible for confirming the noise sources identified by the Region and identifying any additional sources);
- a copy of the draft plan (for subdivision applications) or a brief description of the proposal including lot layout, lot numbers, and unit numbers;
- all data used to calculate noise levels, the noise prediction method (follow MOE guidelines) and clearly identified sample calculations;
- a concise summary of projected noise levels for outdoor and indoor living areas at appropriate receiver locations (shown on a plan) before and after mitigation measures;
- discussion of alternative subdivision layouts, site planning options and/or building design solutions considered for noise mitigation ; and
- a summary sheet and a plan which clearly show the recommended noise attenuation measures for specific lots and units and how they will be implemented.

5.9 If a barrier is proposed for noise attenuation, the Noise Study must include:

- economic, planning and engineering justification for the use of a wall or berm;
- typical and worst case cross-sections, at an appropriate vertical and horizontal scale, which clearly show the barrier, the noise source, the noise receiver, and property limits;
- a grading plan of the area subject to noise attenuation measures, showing locations of cross-sections, final grades, and elevations of the edge of pavement, noise source, noise receiver, and noise attenuation features;
- drainage details;
- specification of the type, surface density and location of the proposed barrier (if adjacent to a Regional Road, must conform with policies in Section 7 of this Implementation Guideline); and
- consideration of the impact on existing trees of constructing a noise wall or earthen berm (i.e. damage to the root zone, trees destroyed) and reference to the related Tree Saving Plan.

5.10 Notwithstanding Policies 5.8 and 5.9, it is expected that the level of detail in the Noise Study will be consistent with the type of planning application and the completeness of available information about the proposal. The Noise Consultant may wish to review the scope of the Noise Study with Regional staff prior to undertaking it. Where future refinements to the application or a significant delay in its implementation are expected to affect the results of the Noise Study, a requirement to update the Study must be included in the Study recommendations.

- 5.11 A minimum of three copies of the Noise Study report must be submitted to the Regional Department of Planning and Culture, and two copies must be submitted to the Area Municipality. Planning and Culture staff will consult with staff from other Regional Departments and the Area Municipality as needed.
- 5.12 When the Noise Study is considered acceptable by all review agencies, the consultant/owner will be notified that appropriate conditions will be implemented by Regional staff through the development application approval process.
- 5.13 The recommendations of a Noise Study submitted prior to registration of a Plan of Subdivision will be considered valid for 5 years. If the subdivision plan is not registered within that time, the Proponent will be responsible for re-evaluating noise concerns using current data and updating the Report prior to registration.
- 5.14 Where the noise source is a Regional road, the recommendations of the Noise Study will be implemented through a Regional Development Agreement as detailed in Section 6.
- 5.15 Where the noise source is a Provincial Highway, an Area Municipal road, or a railway, the recommendations of the Noise Study will be implemented through conditions of approval and an agreement with the Area Municipality. This agreement must also make provision for the ongoing maintenance of any barriers located on private property.

6. **IMPLEMENTATION THROUGH REGIONAL DEVELOPMENT AGREEMENT**

(Note: These policies apply where the noise source is a Regional Road. For other noise sources, the Area Municipality may choose to follow these policies, or may establish different implementation policies.)

- 6.1 Where attenuated or unattenuated noise levels exceed the noise criteria, the owner must enter into an agreement to include a Noise Warning Clause in offers to purchase or rental agreements. The wording for all Noise Warning Clauses is found in the document "Standard Conditions of Draft Approval", as amended.
- 6.2 Where provision for central air conditioning is required, the Noise Warning Clause is extended to explain the reason for inclusion of a forced air ducted heating system in the unit.
- 6.3 Where noise attenuation features have been installed prior to occupancy, the Noise Warning Clause is extended to state this.
- 6.5 Where a barrier is required, the type, location and height of the barrier will be stated in the Regional Development Agreement. Where the barrier is to be a wall, it will be a term of the Regional Development Agreement that, prior to construction, the detailed design and location of the wall must be submitted in a Noise Wall Design Report described in Section 7.2 of this Implementation Plan. The barrier will be taken into account in all grading and drainage plans.
- 6.6 Where a noise wall is constructed on Regional property, the Proponent will be required to pay 55% of the estimated construction cost into a barrier replacement fund, to be used to

replace the barrier in the future. This is estimated to be sufficient to provide for a one-time replacement of the barrier, assuming a 30 year life span and 2% marginal rate of return.

- 6.7 Where a multiple unit rental or condominium development is permitted to locate a noise barrier on its property (see Policies 7.1.2 and 7.1.3), the following clause will be included in a Regional Development Agreement to address maintenance:

"The Developer agrees to preserve the function of and to maintain the acoustic barrier located upon the lands. The purpose of the barrier is to attenuate noise from (name of noise source). The Developer agrees that the Region, through its employees and agents has the right to enter onto the lands to inspect the acoustic barrier. The Developer agrees to repair or, if necessary replace the acoustic barrier. Should the Developer fail to repair or replace the barrier upon receipt of a written notice from the Region, as the Region deems necessary, the Developer agrees that the Region may undertake such work upon the expiration of the time set out in the notice. If such work is undertaken by the Region, the Developer hereby agrees to permit entry upon the lands for this purpose and agrees to reimburse the Region fully for all costs of undertaking such work."

- 6.8 Where a barrier is constructed on private property within a condominium development, it shall be included as a common element of the corporation in the Declaration.
- 6.9 If a noise attenuation wall is required, the Regional Development Agreement will include a provision for its release when the Proponent provides an Engineer's Report to the Region's Commissioner of Engineering. This Report, submitted following construction of the noise barrier, must include:
- 1) test certificates for each production lot supplied to the project, showing compliance with all the requirements of the approved Detailed Noise Study Report and Noise Wall Design Report;
 - 2) "As Built Plans" including ties to the property line, ground grades, bottom of footing elevations and top of wall elevations.

The Regional Municipality will issue a Certificate of Compliance once the report has been approved.

- 6.10 If noise attenuation features other than barriers (such as building set-back, building components or provision for air conditioning) have been required as conditions, the Regional Agreement will include a provision for their release when the applicant provides a report from a competent person acceptable to the Regional Municipality indicating that the measures required in the Agreement have been provided.
- 6.11 Where a specific distance set back has been identified as a noise mitigation measure, the Area Municipality will be required to include this set back as specific rear, side or front yard set back in the implementing zoning by-law. Where the noise source is a Regional road, this set back will also be identified in a registered agreement with the Region to serve as a notice to future owners should they wish to expand the dwelling or pursue an application to the Committee of Adjustment to reduce the specified set back.

7. NOISE BARRIERS ADJACENT TO REGIONAL ROADS

(Note: These policies apply where the noise source is a Regional Road. For other noise sources, the Area Municipality may choose to follow these policies, or may establish different implementation policies.)

7.1 Noise Barrier Specifications

7.1.1 The following criteria must be used in all noise barrier design calculations unless otherwise justified:

- height of outdoor noise receiver is 1.5 m above the ground at a point located 3.0 m from the rear wall of a dwelling unit unless an alternate outdoor recreational area is provided;
- the generally accepted maximum wall height is 2.4 metres; total barrier height may be increased by use of a berm/wall combination; barrier heights greater than 2.4 metres require consultation with Area Municipal staff and may require Area Municipal Council approval;
- barrier must be high enough to break the line of sight between the source and receiver;
- minimum wall height is 1.8 metres; and
- density of wall is 20 kg per sq. metre with no holes or gaps.

7.1.2 The following criteria must be used to determine the location of a noise barrier unless otherwise justified:

- where the barrier is a wall, it will be located entirely on Regional property, immediately adjacent to the property line;
- where the barrier is a berm, it will be located entirely on the Proponent's side of the property line; the chain link security fence will be located on the road side of the property line at the base of the berm; and an easement will be granted to the Region for the road-side half of the berm to ensure that portion of the berm is not altered;
- where the barrier is a berm/wall combination, the berm will be located entirely on the Proponent's side of the property line; the wall will be located at the top of the berm; the wall will have a minimum height of 1.8 m if it is to take the place of the chain link security fence; and the road-side half of the berm including the noise wall will be dedicated to the Region;
- berms adjacent to a Regional road will have a boulevard side slope no steeper than 3:1 (horizontal:vertical) unless approved by Regional staff; and
- where noise attenuation structures are interrupted, such as in the case of a walkway and/or property line, staggering of the barrier and/or barrier returns are required with a minimum two to one length to opening ratio.

- 7.1.3 Small sections of noise barriers, such as barrier returns along walkways, may be constructed on the Proponent's property without a specific agreement for maintenance in place.
- 7.1.4 The materials, design and detailed location of any proposed barrier must be to the satisfaction of the Region's Commissioner of Engineering.
- 7.1.5 Any noise wall to be located on Regional property must adhere to the Ministry of Transportation's "Material Specifications for Noise Barriers" and "Special Provisions" for construction of noise barriers on highways (or subsequent replacement documents).
- 7.1.6 Notwithstanding the foregoing, where the property is to be developed with multiple units under a plan of condominium or other form of single ownership, the noise barrier may be located on the private property, provided that Policies 6.7 and 6.8 are satisfied. Approval of the barrier design by the Region's Commissioner of Engineering is required; however, the Proponent may select any materials provided that the density criterion of 20 kg per square metre is satisfied.

7.2 **Noise Wall Design Report**

- 7.2.1 Prior to a noise wall being constructed, a Noise Wall Design Report must be prepared by the Proponent and approved by the Region's Commissioner of Engineering which includes:
- a grading plan approved by all applicable jurisdictions and appropriate cross-sections for the area in which the wall is to be installed;
 - the soils report, shop drawings, design calculations and installation specifications; the shop drawings must show full details of the noise barrier-related items and, if applicable, connections to structures or other fences; all shop drawings shall bear the seal and signature of an Ontario Licensed Professional Engineer;
 - exact colour and pattern for the noise wall;
 - plans showing landscaping and method of boulevard restoration; and
 - mitigation measures for any trees that may be affected by the wall, or reference to a Tree Saving Plan.
- 7.2.2 Portions of the Noise Wall Design Report pertaining to noise wall features, connections to structures, landscaping, tree impacts and mitigation, etc. should be reviewed with the Area Municipality prior to submission to the Region, and include a letter from the Area Municipality indicating agreement with the appropriate report components.

7.3 **Noise Barrier Construction**

- 7.3.1 The noise barrier must be installed to the satisfaction of the Regional Commissioner of Engineering within 1 (one) year of receiving a building permit from the Area Municipality for the development. Notwithstanding the above, the Proponent may apply to the Regional Commissioner of Engineering for an extension to the time required to complete the construction of the noise barrier.

- 7.3.2 Where a noise barrier is constructed on Regional property, the Proponent must provide the Region of Waterloo with a Letter of Credit for the total estimated cost of the barrier construction and boulevard restoration. The Letter of Credit will be released following inspection and acceptance of the noise barrier by Regional staff.
- 7.3.3 The Proponent must obtain a Regional Road Work Permit prior to commencing work in the Regional road allowance.

APPENDIX A: CONSULTANT STATUTORY DECLARATION

CANADA)	In the Matter of the
)	Environmental Protection
PROVINCE OF ONTARIO)	Act and the Planning Act
)	
)	And in the Matter of Part Lot
)	
)	in the City of
)	in the Regional Municipality
)	of Waterloo

I, _____, of the City of _____, in the Regional Municipality of Waterloo,
SOLEMNLY DECLARE THAT:

1. I am a (Professional Engineer/Registered Professional Planner/employed by <name of Firm> which holds a Certificate of Authorization) and have personal knowledge of the matters set out below.
2. I was retained or employed as the principal consultant to undertake the assessment of noise impacts and recommendation of noise mitigation measures for the property described as municipal address/development application number/other identifier in the municipality of _____
3. I had the expertise required to perform these services. Any assessment activities or recommendations requiring the application of engineering principles have been undertaken or supervised by an engineer qualified to perform such services.
4. The information used in the study entitled (name of study) dated _____ is the best available information as of the date of the study.
5. The noise level calculations, the interpretation of noise attenuation requirements, and the recommended measures are in accordance with Ministry of Environment and Energy Guidelines, Region of Waterloo policies, and any applicable policy or guidelines of the Area Municipality, and any other applicable policy or guideline.
6. The physical noise attenuation measures proposed in this study are feasible to implement and will provide the level of attenuation indicated in the study.
7. I acknowledge that this study may be subject to a peer review conducted at my cost.

- 8. I acknowledge that public authorities and future owners, occupants and others may rely on this statement.

AND I make this solemn Declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath.

DECLARED before me at the City)
of _____, in the Regional)
Municipality of Waterloo) _____
this ___ day of _____.)

REGIONAL MUNICIPALITY OF WATERLOO
IMPLEMENTATION GUIDELINE FOR NOISE POLICIES

PART B
EXISTING DEVELOPMENT IMPACTED BY
PROPOSED REGIONAL ROAD UNDERTAKINGS

1. PURPOSE

1.1 Chapter 11, "Transportation Opportunities" of the Regional Official Plan (1996) includes the following policy concerning the impact of noise from proposed Regional road undertakings:

11.9.4 The impact of noise generated by increased traffic volumes that result from proposed Regional road system expansions will be considered prior to approval of the project, where such projects are located adjacent to existing noise sensitive land uses. During the review of these projects, consideration will be given to implementing noise attenuation measures in accordance with the Regional Implementation Guideline relating to noise mitigation.

1.2 The purpose of Part B of the Implementation Guideline is to state how this policy will be implemented with respect to the scope of its application, the assessment of noise levels, the types of attenuation measures to be considered and the criteria for considering a noise barrier.

2. SCOPE AND DEFINITIONS

2.1 Proposed Regional Road Undertakings refer to proposals for the widening of an existing Regional road, or the construction of a new Regional road, adjacent to an existing developed area (i.e. already built or under Registered Plan of Subdivision) of noise sensitive land use.

2.2 Implementation of noise control measures in connection with the widening or construction of roads under Provincial or Area Municipal jurisdiction will be subject to the policies of those jurisdictions.

2.3 In all cases where a Regional road is to be widened or constructed, such work will be undertaken in conformity with the Environmental Assessment Act including noise impact assessment and mitigation.

- 2.4 Noise Sensitive Land Uses are defined as uses which may be adversely impacted by noise from transportation sources, including residential developments, seasonal residential developments, and hospitals, nursing/retirement homes, schools and day-care centres.
- 2.5 The Outdoor Living Area is defined as an outdoor amenity area where the enjoyment of the outdoor environment is important, such as:
- the backyard or patio within 3 metres of the rear wall of a residential unit; or
 - the common outdoor area allocated for recreational purposes outside residential buildings such as apartments or condominiums.
- 2.6 Balconies are considered part of the outdoor recreation area where they are the only outdoor living area for the occupant and meet the following conditions:
- depth greater than 4 metres;
 - outside the exterior building facade; and
 - unenclosed.

3. ASSESSMENT OF NOISE LEVELS

- 3.1 Assessment of noise levels will be undertaken as a component of the design study for the road in question.
- 3.2 Existing and projected noise levels for the Daytime (7 a.m. to 11 p.m.) period will be assessed for the existing outdoor living areas affected by the proposed undertaking, using procedures acceptable to the Ministry of the Environment.
- 3.3 The existing noise level will be calculated using the current traffic volume. If there is no existing road, 55 dBA will be used as the existing noise level.
- 3.4 The projected noise level will be calculated using the 10-year traffic volume forecast, and taking into account any proposed design measures which could reduce noise.

4. NOISE ATTENUATION MEASURES

- 4.1 The types of noise control measures available for consideration include but are not limited to: location of road allowance, location of pavement within the road allowance, vertical alignment, pavement surface type, and noise barriers. In selecting the type and extent of such measures, the Region will consider: the extent of attenuation achievable; the cost of the measure relative to the attenuation achieved; and the wishes of affected residents.

- 4.2 In the event that non-barrier alternatives are not sufficient, construction of a noise barrier will be recommended for consideration by residents, Area Municipal Council and Regional Council in the following situations:
- where the projected noise level exceeds 65 dBA; or
 - where the projected noise level exceeds 60 dBA and the difference between the existing and projected noise levels is 5 dBA or more.
- 4.3 The noise barrier will be designed to achieve a 5 dBA or more reduction in the Daytime Outdoor living area noise level and to reduce the projected noise level to 60 dBA or less. The proposed height, location and design to achieve these objectives will be reviewed by residents, Area Municipal Council and Regional Council.
- 4.4 The final decision concerning the funding and installation of a proposed noise barrier will be made by Regional Council in conjunction with the road design approval.

5. IMPLEMENTATION AND MAINTENANCE

- 5.1 The location, design, and construction of the noise barrier will be undertaken by the Region, in consultation with the Area Municipality.
- 5.2 The Region will be responsible for maintenance of the barrier while the road is under its jurisdiction.
- 5.3 If construction of the proposed undertaking does not occur within 5 years of the noise assessment, noise levels will be re-calculated and the need for a noise barrier will be re-assessed prior to construction.
- 5.4 Where it is the decision of Regional Council not to include noise attenuation barriers in the road undertaking, residents may consider pursuing the construction of a noise barrier through the provisions of Part C of this Implementation Guideline.
- 5.5 Where it has been the decision of Regional Council not to include noise attenuation barriers in the road undertaking, affected residents may request the Region to review the need for a noise wall within 5 years of the road construction. For this review, the "revised" noise level will be calculated using current traffic data. The need for a noise barrier will be determined using Policy 4.2, where the "projected" noise level is replaced with the "revised" noise level. If the review shows the need for a noise barrier, and residents, Area Municipal Council and Regional Council are in agreement, the noise barrier will be constructed by the Region.

REGIONAL MUNICIPALITY OF WATERLOO
IMPLEMENTATION GUIDELINE FOR NOISE POLICIES

PART C

**EXISTING DEVELOPMENT IMPACTED BY NOISE
FROM EXISTING REGIONAL ROADS**

1. PURPOSE AND FINANCING

- 1.1 The purpose of Part C is to detail how the Regional Municipality will respond to concerns raised by owners of existing noise sensitive land use about the impact of noise from an adjacent Regional Road.
- 1.2 Such concerns may arise as a result of increased traffic volumes, an increase in the number of heavy vehicles using the road, or failure of an existing noise attenuation measure.
- 1.3 Where construction of a noise barrier is identified as the preferred option by residents, the Area Municipality and Regional Council, the full cost of designing and constructing the noise wall will be shared among the residents and Region in the following way:
- 50% affected residents;
 - 50% Region.
- 1.4 When considering the recommendation for the construction of a noise barrier, Regional Council will also establish the timing of construction, based on whether funds are available in the current budget or will need to be allocated in the budget of the following year.
- 1.5 In extenuating circumstances, Engineering Committee may consider a request from affected residents to adjust the cost-sharing formula. *(Note: Regional Council has directed staff to consider further revisions to this policy to address residents' concerns.)*

2. SCOPE AND DEFINITIONS

- 2.1 This Part of the Implementation Guideline applies only to Regional Road facilities as noise sources. Any noise source not controlled by the Regional Municipality (for example, air conditioner, industrial noise source) is not subject to this Guideline. It applies to noise sensitive land uses as receivers. These are defined as uses which may be adversely impacted by noise from transportation sources, including residential developments, seasonal residential developments, and hospitals, nursing/retirement homes, schools and day-care centres.

- 2.2 The Outdoor Living Area is defined as an outdoor amenity area where the enjoyment of the outdoor environment is important, such as:
- the backyard or patio within 3 metres of the rear wall of a residential unit; or
 - the common outdoor area allocated for recreational purposes outside residential buildings such as apartments or condominiums.
- 2.3 Balconies are considered part of the Outdoor Living Area where they are the only outdoor living area for the occupant and meet the following conditions:
- depth greater than 4 metres;
 - outside the exterior building facade; and
 - unenclosed.
- 2.4 A noise barrier is an acoustic wall and/or earth berm. For the purpose of this Part of the Implementation Guideline, the noise barrier must be constructed within the Regional road right-of-way. In almost every case, the noise barrier will be an acoustic wall which must be constructed to Regional standards.
- 2.5 An "affected resident" is defined as the owner of a lot, or a condominium corporation, abutting directly on the barrier. In accordance with the Local Improvement Act, construction of the barrier must be supported by at least two-thirds of the affected residents representing at least 50% of the property value. The cost of barrier design, construction and financing will be apportioned to the affected residents and charged over a period of 10 years by the Area Municipality, on behalf of the Regional Municipality.
3. **REGIONAL RESPONSE TO AN ENQUIRY CONCERNING ROAD NOISE**
- 3.1 When a noise concern is initially raised by a resident through a letter or telephone call, it will be directed to Regional Engineering-Corridor Planning Section.
- 3.2 A Corridor Planning staff member will respond by describing the policies of this Guideline, and assisting the resident to understand whether the Guideline applies to their particular situation. Noise attenuation options that could be undertaken by the individual resident will be described. These include: installation of air conditioning, window upgrades, and/or installation of private noise wall. A copy of this Implementation Guideline will be provided to the resident.
- 3.3 Noise attenuation measures that could be undertaken by the Region will also be considered in the context of approved operating and capital programs. These may include: re-paving, signage to avoid use of engine brakes, construction of new roads to reduce traffic on existing roads, etc. Corridor Planning staff will undertake to advise the resident on the feasibility of such measures within a reasonable time period.
- 3.4 If the resident chooses to pursue the complaint, details of the situation must be submitted in a written format, addressed to the Region's Commissioner of Engineering.
- 3.5 Upon receipt of a formal complaint, it will be acknowledged by a written response from the Regional Municipality.

- 3.6 Regional staff will assess the situation to determine:
- applicable noise source(s)
 - location and type of noise receiver
 - characteristics of site
 - noise-related conditions of development
 - any other pertinent information
- 3.7 The existing noise level in the Outdoor Living Area will be calculated based on existing average daily traffic volumes for the Daytime (7 a.m. to 11 p.m.) period, using procedures acceptable to the Ministry of the Environment and Energy. *(Note: Regional Council has directed staff to consider further revisions to this policy to address residents' concerns.)*
- 3.8 If the existing noise level is 60 dBA or less, the resident will be advised that this level is typical for an urban area, and that no further action will be taken by the Region.
- 3.9 If there were noise-related conditions of development that have not be satisfied or have failed, the resident will be advised of this. Regional staff may be able to suggest a possible course of action.
- 3.10 If the existing noise level exceeds 60 dBA, the resident will be advised of these results and again advised of individual options such as a privacy fence, window improvements or air conditioning that could be undertaken by the resident. No further action would be taken by the Region unless the resident again advises that he/she wishes to pursue a noise wall option.
- 3.11 If the noise concern is raised by residents of one or more condominium corporations, it will be recommended that the corporation construct the noise wall or undertake other attenuation measures, rather than proceed under this Implementation Guideline. This will enable the condominium corporation to select the type, design and location of the noise wall.

4. **WHERE RESIDENT PURSUES NOISE WALL OPTION**

- 4.1 Regional staff will document the calculations and also determine the approximate noise wall height, length and cost to attenuate the Daytime Outdoor living area noise level by 5 dBA or more, to less than 60 dBA.
- 4.2 Regional staff will advise all potentially directly affected residents by mail, and arrange a meeting with residents, Area Municipal staff and a Regional Councillor representing the Area Municipality. The purpose of the meeting will be to:
- describe the situation, the individual noise attenuation options available to the residents and the potential noise barrier solution;
 - outline the Local Improvement Act requirements, the benefitting properties, and the approximate costs;
 - discuss whether the residents are interested in a barrier, and whether the Area Municipality would accept a barrier in that location;
 - determine who will represent the residents;
 - identify the next steps.

- 4.3 If there is general agreement to proceed, Regional staff will notify all affected residents and establish a deadline for receiving a petition signed by at least two-thirds of the affected residents representing at least 50% of the property value in accordance with the Act.
- 4.4 Following the response deadline, a report will be prepared for Regional Council, copied to the affected residents, with the results of the response, and recommending construction of the noise barrier if sufficient residents support the proposal. Regional Council will circulate the report to the Area Municipal Council prior to considering the recommendation.
- 4.5 Upon decision to proceed, Regional staff will contract out the design and construction of the noise barrier. All of these costs, as well as financing costs, will be cost-shared among the parties in accordance with Policy 1.3.
- 4.6 Regional staff will inform the residents of the final cost. The Area Municipality will add the appropriate amount to the tax bill of each resident, and reimburse the Region as the funds are collected.