

REGION OF OTTAWA-CARLETON  
RÉGION D'OTTAWA-CARLETON

REPORT  
RAPPORT

Our File/N/Réf. Your File/V/Réf.	42-98-0008
DATE	7 January 2000
TO/DEST.	Coordinator, Transportation Committee
FROM/EXP.	Planning and Development Approvals Department Commissioner
SUBJECT/OBJET	<b>NOISE MITIGATION RETROFITTING GUIDELINES</b>

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### DEPARTMENTAL RECOMMENDATION

**That the Transportation Committee recommend Council approve the proposed draft noise barrier retrofitting policy attached at Annex "A".**

### BACKGROUND

At its meeting on 17<sup>th</sup> June 1998 Transportation Committee adopted the following motion:

*"That staff develop a draft policy / priority rating system, and implementation program concerning retrofitting noise mitigation measures along the Regional Transportation System".*

The draft noise barrier retrofitting policy attached at Annex "A" has been prepared in response to the Committee's directive and, upon adoption by Regional Council, will be included in the Consultant's final report.

### CONSULTING ASSISTANCE

In September 1998 the acoustical consulting firm, SS Wilson Associates, Richmond Hill, Ontario was given the assignment, under delegated authority, to assist with the completion of a report addressing the Committee's motion.

Staff from the Planning / Development Approvals and the Transportation / Environment Services Departments collaborated with the consultant, Mr. Hazem Gidamy, P. Eng. in the development of the policy. Mr. Gidamy has provided acoustical expertise to the Region on many occasions in the past.

## PROPOSED DRAFT NOISE BARRIER RETROFITTING POLICY HIGHLIGHTS

The proposed policy reflects input received from a recent survey of local and regional municipalities in Ontario. Among those who responded, three out of a total of eleven local municipalities and one from a total of seven regional municipalities, indicated that they have a noise barrier retrofit policy in place.

The salient elements of the proposed draft policy are:

- To apply only to existing residential developments adjacent to the existing Region of Ottawa-Carleton surface transportation system (Roads\* and Transitways) approved prior to 27 January 1993. (Date of approval of guidelines for new developments along Regional Roads and Transitways).
- To apply only to reverse-frontage residential development.
- The program to be administered in accordance with the requirements of the Municipal Act or the Local Improvement Act.
- Noise mitigation measures to be requested by petition signed by the required majority of property owners.
- Costs (installation/maintenance/taxes) to be shared equally between the Region and all property owners along whose property the noise barrier is installed.
- Only applicable to residential development where the existing Leq. 16 hr(Leq. ½ hr)\*\* noise levels exceed 60dBA(63dBA)\*\*.
- The minimum number of residences to be considered per barrier section is 5 continuous lots.
- Barrier heights to be commensurate with achieving at least a 5 dBA Insertion Loss (noise level reduction) at the first row of receptors as calculated in the backyard (centreline of the lot at 3m from the rear wall of the dwelling).

## RECOMMENDED QUALIFYING NOISE LEVEL

Critical to the potential costs of a retrofit program, such as is being recommended, is the noise standard to be adopted to qualify for initial consideration.

Table 1 illustrates the potential costs of a retrofit program relative to the noise levels currently being experienced along 362 sections of the existing Regional Road System and reflecting two principal barrier materials. Costs include installation, maintenance, and taxes.

**Table 1: Relative Costs v Qualifying Noise Level**

Year	Material	Qualifying Minimum Noise Level Before Mitigation		
		≥ 65(68)dBA	≥ 60(63)dBA	≥ 55(58)dBA
1999	Wood	\$0.5m	\$5.5m	\$13.25m
	Concrete	\$1.0m	\$11.0m	\$26.5m

\* For the year 2000 this policy will apply to the Regional Road network. After January 2001 it is likely that the City of Ottawa road network will be classified into categories such as arterials, collectors and local roads and the policy will apply to all those roads in the arterial category.

\*\*Noise level depends on average traffic volume flow used as basis for noise level determination.

As a result of the comparative costs illustrated in Table 1 an existing noise level of 60(63)dBA or greater is recommended as the fundamental qualification for retrofitting consideration. Over time if carrying costs are less than anticipated, the basic qualification standard can be reduced.

### POTENTIAL COST IMPLICATIONS OF RECOMMENDED DRAFT POLICY

Based on a qualifying existing noise level standard of 60(63)dBA or greater, the existing Regional Road System was analysed to estimate the potential costs of a retrofit program, both today, and at 2010, when traffic volumes and resulting traffic noise will have increased.

Table 2 reflects the possible cost of such a retrofit program, based on the assumption that approximately 15% of the potential homeowners where barriers might be effective today, and 40% of corresponding homeowners in 2010, subjected to noise levels in excess of the qualifying standard, request retrofitting. Estimates reflect installation, maintenance, and taxes:

**Table 2: Potential Program Costs (Installation/Maintenance/Taxes)**

Cost of Barriers	Year - 1999	Year - 2010
Wooden Barrier	\$2.0m	\$6.0m
Concrete Barrier	\$4.0m	\$12.0m
Wooden Barrier per Dwelling	Approximately \$4,000	Approximately \$4,000
Concrete Barrier per Dwelling	Approximately \$8,000	Approximately \$8,000

### CURRENT PRIORITY SITES (PROVISIONAL)

Table 3 reflects a very provisional priority ranking of the noise situation along the Regional Road System today for all those sections of the system that would qualify under the proposed Noise Retrofit Policy.

There are approximately 20 road sections today representing potentially approximately 550 dwelling units that might participate in the proposed noise barrier retrofit program.

Based on the noise situation at 2010 approximately 1400 dwelling units might participate in the proposed program.

**Table 3: Potential Qualifying Sections of the Regional Road System**

Existing Noise Level	Road Name	Limits	No. of Lanes
> 65/68 dBA*	Bank Street	Leitrim to Lester	4
	Montreal Road	Shefford to Bathgate	4
	Vanier Parkway	McArthur to Beechwood	4
60/63 to 65/68 dBA*	Carling Avenue	Preston to Bronson	6
	Vanier Parkway	Coventry to McArthur	4
	Richmond Road	Churchill to Woodroffe	4/2
	Heron Road	Bank to Bronson	4
	Riverside Drive	Uplands to Walkley	4
	Walkley Road	St.Laurent to Albion	4
	Prince of Wales Drive	Baseline to Rideau view	2
	Woodroffe Avenue	Baseline to Hunt Club	4
	10 <sup>th</sup> Line Road	Innes to St. Joseph	4
	Innes Road	Mer Bleue to 10 <sup>th</sup> Line	2
	Baseline Road	Fisher to Prince of Wales	4
	Fallowfield Road	Holitman to Cedarview	2
	Innes Road	Cyrville to Blair	4
	Ogilvie Road	Blair to Appleford	4
	Carling Avenue	Pinecrest to Grandview	4
	Bank Street	Lester to Hunt Club	4
Russell Road	Walkley to St. Laurent	2	

**ANALYSIS OF COMPLAINTS RECEIVED**

Staff regularly receive complaints from residents concerning existing traffic noise levels along the Regional Road system. These complaints either come directly to staff or are relayed by Regional Councillors.

The following is an analysis of complaints which are currently on file with commentary as to whether or not they would qualify for retrofitting in accordance with the proposed draft policy.

- I. Eastcliffe Way (near Hwy 417/RR174 Interchange): There are two noise sources involved, Hwy 417 which is under MTO jurisdiction and RR174 under ROC jurisdiction. On the basis that the traffic volume on RR174 is by far the greater of the two noise sources it is reasonable to conclude that this site is a potential candidate for retrofitting.
- II. Saxony Crescent/Cyrville Road: Located near the intersection of two Regional roads, Innes Road which has 4 lanes and Cyrville Road which has two lanes. This location is a potential candidate for retrofitting.
- III. Stonehenge Crescent/Innes Road: Located along the north side of Innes Road, a 4 lane arterial, it is a potential candidate for retrofitting. The Environmental Assessment for the widening of Innes Road between Hwy 417 and Blair Road is currently underway and traffic

noise will be addressed in detail.

- IV. Elmlea Drive/Ogilvie Road: Located along the north side of Ogilvie Road, which is a 4 lane arterial, it is a potential candidate for retrofitting.
- V. Elderberry Terrace/RR174: Located along the north side of RR174 and despite the fact that there is a noise barrier in place, an earthen barrier, it appears that it's effectiveness is questionable due to height. Hence this location is also considered as a potential candidate for retrofitting.
- VI. Fallowfield Road: In the vicinity of Woodroffe Avenue there are high quality noise barriers in place. Farther west there is a great variety of barrier types/fences, most of which are totally ineffective as noise barriers. This is a candidate for retrofitting.
- VII. Ramsgate Private/Airport Parkway: Located on the Airport Parkway corridor at the Brookfield interchange this location is a potential retrofit candidate in view of the recent dramatic increase in Airport Parkway traffic.
- VIII. Hackett Street/Riverside Drive: Well removed from Riverside Drive it is unlikely to qualify at this time as a potential candidate for retrofitting.
- IX. Havelock Street/Harvey Street: As the dominant noise source is the Nicholas Interchange on the Queensway, an MTO facility, this location would not qualify for retrofitting.

#### REGIONAL OFFICIAL PLAN/TRANSPORTATION MASTER PLAN

The ROP contains policies to ensure that communities are not subject to unacceptable levels of noise. This proposed policy complements the policies for road, rail and rapid transit noise contained in Section 11.6.2 (P158) of the ROP and the ROP will be amended accordingly to augment the policies already in place.

#### CONSULTATION:

While there has been no public consultation directly associated with the proposed policy and program, interest on the part of the public for a noise barrier retrofit program has been the motivation for its development. The installation of noise barriers at the request of community groups in accordance with the proposed policy will be in accordance with local by-laws.

#### FINANCIAL IMPLICATIONS:

The adoption of the noise retrofitting policy, as proposed, and the necessary program to implement, based on an equal cost-sharing between ROC and the benefiting community, will require new funds in the 2001 Budget.

*Approved by  
Nick Tunnacliffe, MCIP, RPP*

DRAFT PROPOSED  
NOISE BARRIER RETROFIT  
POLICY

## **THE PROPOSED POLICY**

This section provides the basis for the proposed policy to retrofit noise mitigation measures along the Regional Transportation System.

**Policy Statement:** The Region of Ottawa-Carleton (ROC) will participate in retrofitting noise mitigation measures along the Regional transportation system (Regional Roads\* and Transitways) by constructing noise barriers in accordance with the technical and financial details of this Policy.

Implementation of this policy is dependent upon budget allocations and subject to prioritization of candidate sites.

**ROC Noise Control Programs:** There are three distinct Regional programs to address noise generated by vehicular traffic using the Regional Transportation system. The Technical procedures and onus for financing the noise mitigation measures for each program differ as follows:

For new noise-sensitive development, the onus is entirely on the proponent of the land use to satisfy the ROC guidelines approved by Regional Council on January 27, 1993: “Noise Control Guidelines for New Developments Adjacent to Existing and Proposed Regional Roads and Transitways”.

For new Regional transportation system undertakings, the onus is on the Region to satisfy the Environmental Assessment Act in accordance with the ROC guidelines approved by Regional Council on October 25, 1995: “Noise Control Guidelines for New Construction, Reconstruction and Widening of Regional Roads and Transitways”.

This Policy applies to existing residential developments adjacent to the existing Regional surface transportation system (Regional Roads and Transitways) where the costs for retrofitting noise mitigation measures will be shared between the Region and the homeowners as outlined in this Policy.

\* For the year 2000 this policy will apply to the Regional Road network. After January 2001 it is likely that the City of Ottawa road network will be classified into categories such as arterials, collectors and local roads and the policy will apply to all those roads in the arterial category.



**Background:** Over the past several years the ROC has received several requests from area residents to investigate and consider the possibility of installing noise attenuation barriers on a retrofit basis in existing residential areas adjacent to Regional Roads and Transitways. Most of these areas were developed prior to the development and implementation of the Ministry of the Environment sound level criteria and/or the ROC noise control guidelines for new noise-sensitive developments adjacent to Regional Roads and Transitways. So far, most of the requests from the area residents have been deferred until an appropriate Policy is developed and adopted. The only exceptions are those requests made by some area residents adjacent to Regional transportation systems which were undertaken as part of a Capital Works Program such as new construction, reconstruction and widening of Regional Roads and Transitways. Construction of noise barriers in such cases were either mandated by the Environmental Assessment process or on a case-by-case technical investigation. Examples of such cases include the sound barriers constructed along Eagleson Road, 10<sup>th</sup> Line Road, Hunt Club Road, and Baseline Road.

**Purpose:** Retrofit noise mitigation barriers may be installed in existing residential areas which meet the warrants established in this Policy. Their purpose is to reduce the existing sound levels in Outdoor Living Areas (OLAs) as much as is technically, economically, and administratively practical towards the Region's established sound level objective for retrofit cases.

**Requests for Retrofitting:** A petition requesting the installation of a noise attenuation barrier and signed by the landowners as required under the Municipal Act or the Local Improvement Act, must be submitted to the ROC.

At least two-thirds of the affected property owner(s) representing at least one half of the assessed property value must sign the petition to qualify for the retrofit.

Requests must be received by 1<sup>st</sup> September for consideration for inclusion in the following year's capital works program.

**Exclusions and Limitations Of The Policy:** This policy has been crafted to result in a reasonable and affordable barrier retrofit program not just to retrofit noise barriers along all Regional Roads and Transitways.

There are two main reasons for this approach. Firstly budgetary limitations on the Region's financial resources and secondly some candidate sites may not be suitable for retrofitting due to a variety of technical, economical and administrative factors including, but not limited to, not meeting the specified qualifying sound level, site topography, physical limitations, excessive height, etc.

It is also not the intent of this Policy to apply to other sources of noise such as NCC roadways, Provincial Highways, railways and other transportation facilities that are not part of the Regional Road and Transitway system.

**Noise Sensitive Points Of Reception:** Noise sensitive points of reception that qualify for consideration in this program shall meet the following criteria:

1. A residential area adjacent to a Regional Road or Transitway.
2. Reversed frontage lots or blocks including flanking lots where their Outdoor Living Areas (OLAs) are directly exposed to traffic noise.
3. The residential area must have associated with the residential unit such as a backyard. An OLA is defined as an area at ground level accommodating outdoor living activities. The usual distance from the residential dwelling unit is 3.0 metres within the middle of the dwelling unit with the vertical height being 1.5 metres above the existing ground surface. The OLA must be clearly defined as it will be subject to further technical analysis.
4. The following land uses with OLA's associated with them would qualify as points of reception:
  - a. Single family residences
  - b. Townhouses
  - c. Multiple unit residential buildings, such as apartment buildings with Common Outdoor Living Areas.
  - d. Received Draft Plan Approval or Site Plan Approval prior to January 27, 1993
  - e. The area must be located adjacent to a Regional Road or Transitway.

**Sound Level Criteria:** Areas that qualify as noise-sensitive points of reception shall meet the following criteria:

1. The area/site specific sound levels will be established by the Region in accordance with the technical procedures specified by the Region in the two Noise Control Guideline publications approved by Regional Council on January 27, 1993 and October 25, 1995, as amended from time-to-time.
2. The sound levels will be established based on the existing road and traffic parameters such as the traffic volume, percentage of trucks, posted speed limit, road gradient, etc. Special consideration may be given by the Region to predicting the future sound levels if the road is not and will not be subject to future Capital Works improvements such as widening, where it is suspected that the future volume or traffic composition would result in increased sound levels.
3. The objective sound level for the retrofitting Policy is Leq 16hr(Leq ½hr) 60(63)dBA after attenuation. Therefore, points of reception subject to existing sound levels lower than this objective within the majority of the OLA's will not qualify for consideration. The retrofitting program objective is to reduce the existing and/or future sound levels as much as is technically, economically and administratively feasible towards the Region's

retrofitting objective sound level.

4. The Region will give consideration to all feasible traffic noise control measures when considering an area for noise barrier retrofitting purposes. Prior to the recommendation and approval of a noise barrier for retrofitting, the feasibility of alternative measures, if any is available, will be investigated by the Region.
5. If a noise barrier is to be constructed as part of the retrofitting Policy, subject to the criteria and warrants in this Policy, it must provide a minimum sound Insertion Loss (IL) of 5 dBA when averaged over the first rows of the points of reception. The sound barrier shall also create “acoustical shadow zones” at the majority of the points of reception.

\*Noise level depends on average traffic volume flow used as basis for noise level determination.

**Noise Barrier Technical Criteria:** The use of noise barriers as retrofitting noise mitigation measures will be subject to the following technical criteria:

1. The sound barrier must be installed on a complete block to ensure its effectiveness. Therefore, it is important that the homeowners get together as a group from block to block, or from one side of the development to the other (a discontinuous noise barrier is just about as effective as no noise wall!).
2. Barriers will be constructed on the lot line, where feasible.
3. Where deemed necessary, each section of the noise barrier will be individually designed (location, height, extent, material) and cost estimates will be prepared accordingly.
4. It is the policy of the Region to use noise barrier walls for retrofitting purposes and not berms or berm/wall combinations. The use of berms as a base for a noise retrofitting barrier may be considered on a case-by-case basis only; where technically warranted. In such a special case, the Region will not accept construction of part of the berm on the Regional r.o.w.
5. The Region will not be responsible for the cost and/or cost sharing of replacing or adding any landscaping that may have to be removed, to allow for construction of the retrofit sound barrier.
6. The choice of the type of barrier material and colour will be jointly shared with the homeowners. However, the barrier material specifications will be subject to the ROC Standard for Noise Barriers, as updated from time-to-time.
7. The cost of noise attenuation within an individual dwelling or an outdoor area that is not part of the approved points of reception will be the sole responsibility of the homeowners.

8. The maximum height of a noise barrier wall for retrofit purposes is 3 metres as measured from the barrier base elevation. Higher noise barrier walls may be allowed by the Region subject to investigation of the aesthetics of the installation and depending on the availability of a wide right of way and deep residential lots.

**Construction and Maintenance:** Issues related to construction and maintenance of the retrofitting noise barriers will be subject to the following requirements:

1. The acoustic and engineering design as well as construction of the retrofit noise barrier will be undertaken by the Region (The Region may use sub-contractors to undertake parts or all of the necessary work). The costs of any necessary engineering studies and design will be included in the overall cost of the barriers.
2. Ongoing maintenance is the responsibility of the Region in order to maintain an efficient and uniform standard with respect to the level of quality, design, barrier condition and function.
3. The homeowners will be required to enter into an agreement with the Region, individually.
4. Consideration will be given by the Region to aesthetic impacts when designing noise control measures as well as the safety and security of pedestrians using the street.
5. Construction will be in conformity with local by-laws.

**Costs and Priority** All costs associated with the retrofitting will be subject to the following requirements:

1. Requests for retrofitting will be received by the Region and will undergo initial screening and prioritization in relation to other retrofitting requests and the budget allocated by the Region for barrier retrofitting.
2. The overall cost associated with the retrofit scheme, including the flanking ends, will be estimated by the Region and will be prorated for the landowners on the basis of their rear lot frontage where the sound barrier will be installed. There will be no adjustments for irregular lot sizes.
3. Retrofit requests which are warranted will be prioritized based on this Policy, and subsequently included in the capital budget in accordance with the availability of funding. Project financing will include a 50% recovery of the total estimated cost from benefiting land owners through annual charges under the provisions of the Municipal Act or the Local Improvement Act.
4. The minimum number of residences to be considered for this policy is 5 dwelling units.

5. The Regional subsidy will apply to a maximum average lot width of 20 metres. The Region will not provide any subsidy for barrier construction in excess of 20m.

**ROC Staff Responsibilities:** The following are the technical responsibilities that fall to staff of the ROC in regards to retrofitting:

1. The staff will be responsible, from time-to-time, in updating the Priority List or Ranking for retrofitting purposes based on the most current road and traffic data.

The following are the technical activities that may be carried out to update the Priority Listing:

- a. The traffic data (AADT, speed, truck percentages, day/night split, etc) for all the road sections to be updated.
  - b. The noise prediction model to be run using the updated traffic data and the sound level at the reference distance of 15m and an average receptor location to be established.
  - c. By using the noise prediction model and the previously established distances, new barrier heights to achieve 60(63)dBA in the Outdoor Living Areas to be calculated and the data then entered into the spreadsheet calculation model for all the Regional roads.
  - d. The cost of wood and concrete (or other suitable barrier products acceptable to the Region) to be updated and entered into the spreadsheet model.
  - e. Other demographic data, such as the number of affected dwelling units, to be updated and entered into the spreadsheet model to update the previous data.
  - f. Areas not requiring sound barriers or those not qualified for the sound barrier retrofit program to be identified and the data in the spreadsheet model to be revised accordingly.
2. Upon receipt of a petition or request for retrofitting from the public, the staff shall visit the area of concern and investigate the area for any abnormal conditions that may have been responsible for generating the noise complaints. This may include the presence of pot holes, excessive speeds over the speed limit, temporary construction detours, deteriorating pavement conditions or any other transient issue that is not normally associated with the Regional roadway.
  3. The subject area or road sections shall be checked against the Priority List/Ranking scheme and verified to be worthy of further consideration.
  4. Staff shall, if the subject area meets the retrofit Policy warrants, prepare the necessary technical and financial details based on the necessary considerations including, but not limited to, the following:
    - a. Up-to-date road and traffic data.
    - b. Ground elevations at the road, the points of reception and the base of a potential noise barrier.
    - c. Proposed noise barrier extent and location alternatives.
    - d. Possible interferences, obstructions such as utilities, daylight triangles, drainage, etc.

- e. Produce drawings to a reasonable scale showing the residential points of reception of concern, the road section, the possible location(s) of the noise barrier, .... etc.
  - f. Prepare detailed sound level calculations for the subject area to comply with the technical criteria of this Policy based on a minimum of one calculation for each group of three adjacent receptors, or as required. The calculated levels shall show the sound levels for the existing and future case without and with the proposed sound barrier. The Leq analysis shall also show the resulting sound levels with various barrier height alternatives.
  - g. Preparation of cost estimates for the work.
5. For specific situations, the ROC may conduct actual field monitoring of the sound levels where deemed necessary (e.g. difficult topographic situations, the presence of numerous sources of transportation sources of noise, etc). In general, measurements, equipment, and procedures shall be in accordance with good engineering practices and based on procedures similar to those specified by the Ministry of the Environment. The measured sound levels should then be compared with the predicted sound level for further decision making.
6. A complete package together with a Summary Section shall be made available to all the affected homeowners or their duly appointed representatives. The Summary Section shall provide clear and concise information on the following:
- Barrier details (extent, height, location, material, colour, ...)
  - The acoustic benefit to be derived including summary of the established sound levels before and after the barrier.
  - Estimated cost of construction (total costs)
  - Timing of construction
  - Other complications, implications, site difficulties, etc.
  - The decision including the Region's financial share.
  - Amount of annual payment by homeowner.