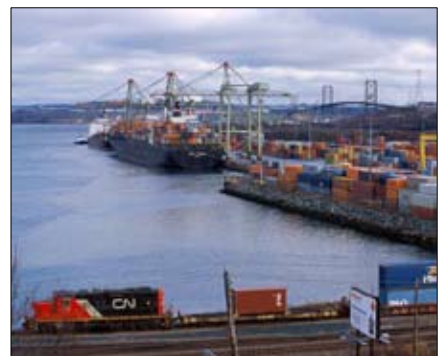


# Final Report Proximity Guidelines and Best Practices

Reprinted August 2007



PREPARED FOR:



PREPARED BY:

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# Final Report

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## Proximity Guidelines and Best Practices

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Prepared for

**The Railway Association of Canada** and

**The Federation of Canadian Municipalities**

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# Introduction

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1

Municipalities are considered to be the economic engines of Canada and Canada's quality of life and competitiveness depends on strong municipalities and sustainable municipal growth and development. Railways ensure efficient movement of goods and people and are vital to the success of Canada and its communities. When issues around growth and expansion of rail facilities and municipalities are not understood and addressed, problems can often be intractable and long lasting.

Rail/municipal proximity issues typically occur in three principle situations: land development near rail operations; new or expanded rail facilities; and/or road/rail crossings. The nature and integrity of rail corridors and yards, which are industrial transportation uses that create considerably noise and vibration, needs to be respected and protected. Safety, trespass, drainage, and/or blocked crossings are other inherent issues as both communities and railways grow in close proximity to one another. The lack of a comprehensive set of proximity management guidelines applied consistently across municipal jurisdictions has greatly amplified these conflicts in recent years, resulting in some cases in (real and perceived) social, health economic and safety issues for people, municipalities and railways.

In June 2004, the Railway Association of Canada (RAC) and the Federation of Canadian Municipalities (FCM) initiated a research project looking at guidelines, practices and issues for new development adjacent to railway facilities and significant changes to rail facilities in existing developed areas. New crossings and grade separation of existing crossings were also reviewed. It is hoped the study recommendations will help municipalities, railway operators, senior governments and

other stakeholders understand the issues and spur them to expand existing and/or introduce new effective rail/municipal proximity policies and guidelines.

## **1.1 BACKGROUND**

Economic growth, increased commuter rail services and increased international trade has required significant expansion of rail facilities including double tracking, new crossings, expanded rail sidings, scheduled freight service, new yards, optimized and/or rationalized terminals, yards and corridors. These changes have often occurred in the midst of rapidly growing communities both large and small. It is no surprise that noise and vibration issues, conflicts at grade crossings and other municipal/rail proximity issues have increased dramatically in some cases.

### **1.1.1 NOISE, VIBRATION, AND CROSSING PROXIMITY ISSUES**

There are two sources of rail noise: noise from pass-by trains and rail yard activities including shunting. Pass-by noise is typically infrequent and of limited duration and primarily from the locomotives. Other noise sources include whistles<sup>1</sup> at level crossings and car wheels on the tracks.

Freight rail yard noises tend to be frequent and of longer duration including shunting of cars, idling locomotives, load cell testing of locomotives, wheel and brake retarder squeal, clamps used to secure containers, bulk loading/unloading operations, shakers, and many others.

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1. Applicable to federally regulated railways and some provincially regulated railways (notably in Quebec and Ontario), except where there is Transport Canada approved relief from whistling, trains are required to sound their whistles for at least 400 metres before entering a public level crossing.

# Introduction

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## 1

Ground borne vibration from the wheel-rail interface passes through the track structure into the ground and can transfer and propagate through the ground to adjacent buildings. Vibration is more difficult to predict and mitigate than noise and there is no universally accepted method of measurement or applicable guidelines. Vibration evaluation methods are generally based on the human response to vibration and the resulting effects on the occupants include fear of damage to the structure, interference with sleep, conversation and other activities.

As urban areas grow in proximity to rail, traffic increases at existing crossings and additional crossings are required to relieve traffic congestion. However, in general, at-grade crossings can increase the exposure to potential vehicle/train and pedestrian accidents as well as delay problems for traffic where frequently used rail lines bisect traffic arterials. Grade separated crossings address both these issues but are expensive to construct. Safety at highway/railway crossings is a concern for all stakeholders and planning is necessary to consider alternatives to creating new grade crossings, including upgrading and improving safety at existing crossings and grade-separated crossings.

## 1.2 PURPOSE OF THIS REPORT

- Raise awareness about railway/municipal proximity issues.
- Provide model development guidelines, policies and regulations and best management practices for use and adaptation as appropriate by all stakeholders, most particularly municipalities and railways.
- Inform and influence railway and municipal planning practices and procedures; to provide for planning systems and approvals that more effectively anticipate and manage proximity conflicts and to better facilitate municipal and railway growth. Municipal and railway stakeholders are encouraged to review and update as necessary their respective planning instruments and company practices/procedures, with a view to undertaking further specific research as necessary and/or implementing relevant components of the recommended development guidelines, policies and regulations.
- Inform and influence federal and provincial governments, with respect to the development and implementation of applicable policies, guidelines and regulations.
- All stakeholders are encouraged to have regard for this document in their respective operations and practices. Railways and all levels of government, in particular, are encouraged to customize and adapt this document to develop and/or expand existing proximity management protocols.



# Introduction

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# 1

## **1.3 STUDY APPROACH**

The research included input from railway and municipal stakeholders and reviews of government legislation and land use guidelines across Canada.

It is hoped this work will facilitate updated regulations and better communication among federal and provincial government agencies and municipal planners, land developers, and railway engineers and planners, to better manage rail proximity issues.



Photo: Courtesy of GO Transit

# Recommendations for Moving Forward

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## 2

Several issues have been identified and can be broadly categorized as follows:

**1. Inadequate communication** – both formal and informal notification and consultation is lacking between and among stakeholders.

**2. Absence of comprehensive or consistent development review** – policies, regulations and approaches for dealing with land use decisions involving rail proximity issues vary greatly from municipality to municipality and are lacking detail in most cases.

**3. Lack of understanding and awareness of rail/municipal proximity issues** – the issues and regulations affecting rail operations and municipal land use decisions are complex and involve every level of government. Each respective stakeholder tends to not be too familiar with the mandate and operating realities of other stakeholders. Rail/municipal proximity issues only arise infrequently for many municipalities, particularly smaller ones, and staff may not be aware of required or appropriate mitigation measures.

### 2.1 COMMUNICATION

A major source of the issues identified was a lack of information sharing and discussion between the key stakeholders, especially early in the planning process.

- Municipalities, landowners, developers and rail operators all need to place a higher priority on information sharing and establishing better working relationships both informally and formally through consultation protocols and procedures.
- Municipalities are encouraged to use their planning policy and regulatory instruments (e.g. District Plans, Official Plans, Secondary Plans, Transportation Plans, Zoning By-

laws/Ordinances, etc.) to secure appropriate railway consultation protocols as well as mitigation procedures and measures.

- Railways need to be more proactive in engaging municipalities and landowners and sharing information on expansion of facilities or changes in operation that may have impacts for adjacent land users.
- As soon as planning is initiated or proposals are known by municipalities or railways, notification and consultation should be initiated for:
  - Development or redevelopment proposals in proximity to rail facilities or for proposals for rail-serviced industrial parks.
  - Infrastructure works which may affect a rail facility such as roads, utilities etc.
  - Transportation plans that incorporate freight transportation issues.
  - All new, expanded or modified rail facilities.
  - Railways and municipalities are encouraged to be proactive in identifying, planning and protecting for optimized use of rail corridors and yards.

### 2.2 DEVELOPMENT REVIEW AND TECHNICAL REQUIREMENTS

Following are recommendations for municipalities to introduce policies and regulation for development near rail facilities. Appendix I contains further information on conducting noise and vibration studies.

Municipalities are encouraged to provide clear direction and a stronger regulatory framework to ensure that land development respects and protects rail infrastructure and will not lead to future land use conflicts. Appropriate performance standards, such as building setbacks from rail corridors and yards, should be incorporated into regulatory documents. Railways also have a responsibility to minimize impacts from facility expansions.

# Recommendations for Moving Forward

## 2

Land use development requirements should include:

- Planning for land uses on each side of a rail corridor or yard should be comprehensively evaluated, with a view to minimizing trespass problems. For example, schools or commercial uses located across the railway corridor from residential uses are likely to lead to trespass issues if there are no public crossings in the immediate vicinity.
- Noise, vibration and other emissions studies and mitigation measures for development in close proximity to rail facilities and for significant rail facility expansions that bring rail activity closer to sensitive land uses;
- Implementation mechanisms for mitigation measures, including long-term maintenance requirements if applicable (e.g. legal agreements registered on title);
- Safety features (protective berms/buffers, building setbacks, security fencing for trespass deterrence, etc.);
- Site access and crossing reviews, including ensuring adequate site access setbacks from at-grade crossings (to prevent vehicular blockage of crossings), protecting at-grade road/rail crossing sightlines, crossing improvements and discouraging new at-grade road crossings;
- Drainage reviews (i.e. ensuring that the existing drainage pattern is not negatively affected);
- Protection of expansion capacity for rail facilities, if applicable;
- Notifications (e.g. rail operation warning clauses) to future residential property owners where feasible;

### 2.2.1 NOISE AND VIBRATION

The distance from rail operations where impacts may be experienced can vary considerably depending on the type of rail facility and other factors such as topography and intervening structures. The following Table is a general sample classification of rail line types.

<b>SAMPLE RAIL CLASSIFICATION SYSTEM *</b> <b>(* To be confirmed by the railway)</b>	
<b>Main Line</b> <i>typically would be separated into "Principal" and "Secondary" Main Line</i>	- Volume generally exceeds 5 trains per day - High speeds, frequently exceeding 80 km/h - Crossings, gradients, etc. may increase normal railway noise and vibration
<b>Branch Line</b>	- Volume generally less than 5 trains per day - Slower speeds usually limited to 50 km/h - Trains of light to moderate weight
<b>Spur Line</b>	- Unscheduled traffic on demand basis only - Slower speeds limited to 24 km/h - Short trains of light weight

Following are recommended minimum noise influence areas to be considered for each type of rail facility when undertaking noise studies:

Freight Rail Yards	1,000 m
Mainline Rail Corridors	300 m
Secondary Lines, Branch Lines, Spur Lines	250 m

## Recommendations for Moving Forward

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# 2

The recommended minimum vibration influence area is 75 m from a railway corridor or rail yard.

Development review of residential or other sensitive land uses proposed within these influence areas should include noise and vibration studies to assess the suitability of the proposed use and to recommend mitigation requirements. The recommended mitigation requirements should then be identified in any subsequent conditions of approval. Similarly, where new or significant modifications to existing rail facilities which require regulatory approval are proposed, potential impacts should be investigated. Recommendations for conducting noise and vibration studies and noise and vibration criteria are contained in Appendix I.

### **2.2.2 BUILDING SETBACKS AND SAFETY BERMS**

- Building setbacks and berms are mainly intended to provide protective buffers and barriers to reduce the risks from a train derailment or other incident and also to provide some noise and vibration attenuation. Residential setbacks from freight rail yards are intended to address the fundamental land use incompatibilities.

The recommended minimum building setbacks<sup>2</sup> and berm heights are as follows:

- Rail freight yard
  - 300 metre setback (for residential uses)
- Mainline
  - 30 metre setback
  - 2.5 metre berm height



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2. Setbacks should always be taken from the railway property line, to protect the entire railway right-of-way or yard.

## Recommendations for Moving Forward

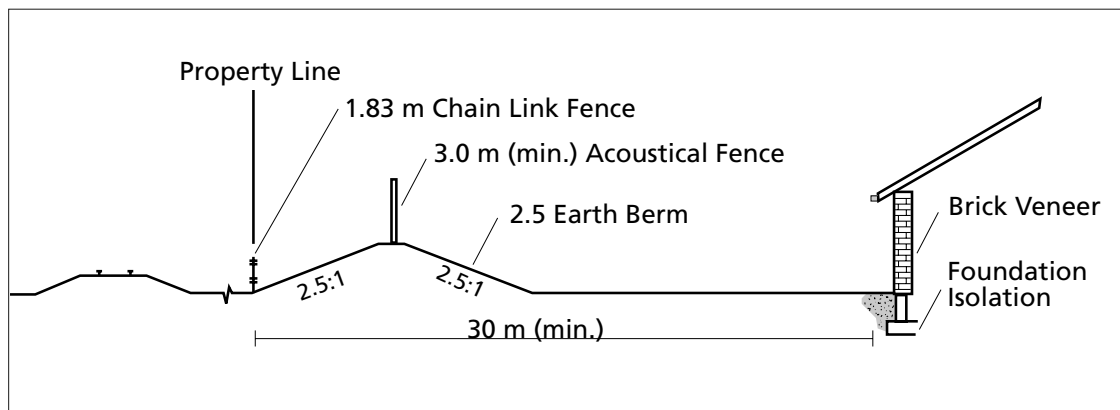
# 2

- Branch/Spur line
  - 15 metre setback
  - 2.0 metre berm height (for branch line)
- Where larger building setbacks are proposed (or are possibly more practicable, such as in rural situations), reduced berm heights should be considered, and where larger berm heights are proposed, moderately reduced setbacks may be considered.
- Where the recommended setbacks or berms are not technically or practically feasible, due for example to site conditions/constraints or the absence of an available mechanism to secure the setback, every effort should be made to ensure as great a setback/berm as is practical, or alternate safety measures such as crash walls are constructed.
- Where there are elevation differences between the railway and a subject development property, appropriate variations in the minimum setback/berms should be determined in consultation with the affected railway. For example, should the railway tracks be located in a cut, reduced setbacks may be appropriate.
- If applicable to the site conditions, in lieu of the recommended berm recommendations, a ditch or valley between the railway and a subject development property that is generally equivalent to or greater than an

inverse berm, could be considered (e.g. a ditch that is 2.5 m deep and approximately 14 metres wide).

### 2.2.3 SECURITY FENCING

- Planning for land uses on each side of a rail corridor or yard should be evaluated, with a view to minimizing trespass problems. For example, schools or commercial uses located across the railway corridor from residential uses are likely to lead to trespass issues if there are no public crossings in the immediate vicinity.
- For any new development, including parks or trails proposed adjacent to rail corridors or yards, a minimum 1.83 m high chain link fence should be constructed and maintained by the proponent along the entire mutual property line to reduce trespass.
- Due to common increased trespass problems associated with parks, trails, open space, community centres and schools located adjacent to the railway right-of-way, increased safety/security measures should be considered, such as precast fencing and fencing perpendicular to the railway property line at the ends of a subject development property.



Typical Mitigation Measures for New Residential Development Adjacent to a Mainline.

## Recommendations for Moving Forward

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# 2

### **2.2.4 DRAINAGE**

- Municipalities should consult with railways regarding proposed land development and/or infrastructure projects which may have impacts on existing drainage patterns. Proposed alterations to the existing drainage pattern affecting Railway property should receive prior concurrence from the Railway and be substantiated by a drainage report as appropriate, to the satisfaction of the Railway. Railway corridors/property with their relative flat profile are not typically designed to handle additional flows from adjacent properties.
- Similarly railways should consult with municipalities where facility expansions or changes may impact drainage patterns.

### **2.2.5 NOTIFICATION MECHANISMS**

- Appropriate legal agreements and restrictive covenants registered on title are recommended to be used if feasible, to secure construction and maintenance of any required mitigation measures, warning clauses and any other notification requirements.

Where such agreements, restrictive covenants, and/or warning clauses are not currently permitted, appropriate legislative amendments are recommended to be undertaken. In some cases, provincial direction may be required to provide appropriate and/or improved direction to the stakeholders.

- Municipalities are encouraged to utilize appropriate specific rail operations warning clauses, if feasible, in consultation with the appropriate railway, to ensure that those who may acquire an interest in a subject property are notified of the existence and nature of the rail operations, the potential for increased rail activities, the potential for annoyance or disruptions, and that

complaints should not be directed to the railways. Such warning clauses should be registered on title if possible and be inserted into all agreements of purchase and sale or lease for the affected Lots/units.

- Municipalities are encouraged to use the minimum influence areas discussed above (i.e. 1,000 m for a rail freight yard, 300 m from a mainline corridor, and 250 m from a branch line or spur line) when using warning clauses or other notification mechanisms.
- Where it is not feasible to secure warning clauses, every effort should be made to provide notification to those who may acquire an interest in a subject property (for example, using property signage, acknowledgements, etc.).
- Municipalities and railways should consider use of environmental easements for operational emissions, registered on title to development properties to ensure clear notification to those who may acquire an interest in the property. Such easements would provide the railway with a legal right to create emissions over a development property and reduce the potential for future land use conflicts.
- Stronger and clearer direction is recommended for real estate sales and marketing representatives, such as mandatory disclosure protocols to those who may acquire an interest in a subject property, with respect to the nature and extent or rail operations in the vicinity and regarding any applicable warning clauses and mitigation measures. Too often, it would appear that potential purchasers are misled about the nature and extent of the rail operations.
- Municipalities are encouraged to require appropriate signage at development marketing and sales centres, identifying: the location of the rail operations; the lots or blocks that have been identified by any noise and vibration studies which may experience

# Recommendations for Moving Forward

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## 2

noise and vibration impacts; the type and location of acoustical fencing and safety (chain link) fencing; any required warning clause(s); and, containing a statement that railways can operate on a 24 hour a day basis, 7 days a week.

### **2.3 LACK OF UNDERSTANDING AND AWARENESS**

Awareness and understanding could be improved by:

- Railways and municipalities allocating additional resources to anticipating and managing proximity issues.
- Railways and municipalities establishing and building upon existing communication channels and protocols to determine the proper contacts for questions and concerns for different types of proximity issues. Some work in this regard has been undertaken, which could be adapted or customized to local situations, and is available on the [www.proximityissues.ca](http://www.proximityissues.ca) website. Also on the website is national railway mapping, showing the location of railway facilities and the name of the rail operator. In addition, both CN and CPR have public inquiry telephone numbers and email contacts available on their websites

([www.cn.ca](http://www.cn.ca) and [www.cpr.ca](http://www.cpr.ca)). The RAC website ([www.railcan.ca](http://www.railcan.ca)) also has links to all member websites.

- Railways offering general rail operations information sessions and tours of facilities to municipal planning staff.
- Associations such as the RAC and FCM, individual municipalities and railways and other levels of government supporting and providing awareness initiatives and training opportunities for the public and for staff – eg. sessions offered at conferences, articles in association publications, CDs, DVDs, brochures, and expanded information on websites.
- Railways and municipalities developing or expanding policies and procedures for meaningful project/application consultation (both formal and informal) early in the planning process.
- Railways and municipalities improving information sharing regarding existing and future plans. Such information sharing should benefit and be incorporated into policy, master and corporate planning initiatives. Cooperation and coordination in this regard would help create positive business opportunities for both parties and would reduce the potential for future land use conflicts.



Photo: Courtesy of VIA Rail

# Understanding Stakeholder Roles and Advancing Issue Recommendations

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## 3

The research has revealed the complexity of interaction between public and private agencies and individuals and that a lack of understanding of roles and responsibilities has contributed to the problems identified. This section provides a brief and hopefully useful overview of these roles and how each stakeholder can help advance the goal of reducing proximity issues.

### **3.1 FEDERAL**

- The federal government's role is to ensure balanced, effective and proactive legislative, regulatory and policy framework for provinces and railways to work within.
- The rail operations or expansions of CN, CPR, and VIA Rail Canada, along with some shortline operators are regulated by the federal government under the Canadian Environment Assessment Act (CEAA), the Railway Safety Act, and the Canada Transportation Act (CTA). Applicable legislation, regulations and guidelines are available from the respective websites.

#### **Recommendations**

- The federal government and the Canadian Transportation Agency are encouraged to use and have regard for this report in proximity dispute investigations and in the development and implementation of any related guidelines, to facilitate a more comprehensive approach that appropriately considers the land use planning framework along with the rail operations issues.

### **3.2 PROVINCIAL**

- Provinces provide the land use regulatory framework for municipalities through Planning Acts, Provincial Policy Statements,

Environmental Assessment Acts, air quality and noise guidelines such as the Ontario Ministry of the Environment Noise Assessment in Land Use Planning documents.

- Provinces generally have jurisdiction to establish land use tribunals to adjudicate disputes, with varying degrees of detail and implementation across the country.
- Some provinces regulate shortline railways.

#### **Recommendations**

Provincial legislation governing land use and transportation planning generally provides directions on ensuring efficient and appropriate land use allocation and tying land use planning to sound transportation planning principles. However, more detailed direction is required to alert municipalities to key rail proximity issues earlier and highlight their importance:

- A provincial noise guideline framework should set impact study requirements – how and when to assess noise sources (e.g. within 300 m of mainline rail corridors) and set specific sound level criteria for noise sensitive land uses (e.g. 55 dBA for outdoor areas during day-time, 40 dBA for indoor living/dining areas and 35 dBA for indoor sleeping quarters);
- Set requirements for early consultations between affected municipalities, rail operators and land owners in advance of proposed land use or transportation changes, projects or works which may potentially impact any of these stakeholders; and,
- Where none exists currently, establishment of an appeal mechanism that would provide railway operators, municipalities or land owners the ability to have concerns that have not been addressed adjudicated.



# Understanding Stakeholder Roles and Advancing Issue Recommendations

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## 3

### 3.3 MUNICIPAL

- Municipalities are responsible for ensuring efficient and effective land use and transportation planning including consultation with neighbouring property owners (such as railways) in carrying out their planning responsibilities.
- Municipal planning instruments include various community-wide and area plans, Zoning By-laws/Ordinances, Development Guidelines, Transportation Plans, Conditions of Development Approval and Development Agreements to secure developer obligations/requirements.
- Municipal governments have a role to play in proximity issue management by ensuring a strong land use planning policy, regulatory and guideline framework and provision of specific conditions in development approvals process that reduce the potential for future land use conflicts and provide adequate protection for rail infrastructure.

#### **Recommendations**

- Municipalities should ensure that planning staff are aware of and be familiar with any applicable policies for development adjacent to rail corridors (eg. rail operator policies and/or guidelines).
- Identify potential land use incompatibilities early on and secure appropriate mitigation implementation mechanisms to minimize conflicts. Municipal planning instruments (e.g. Official Plan, Zoning By-law etc.) should contain policies and provisions to:
  - Ensure that sensitive land uses proposed adjacent to railway corridors be buffered and/or separated through the use of such measures as setbacks, fencing, site grading, berms and landscaping to prevent adverse effects from noise, vibration, odour and other contaminants, and to promote safety;
  - Protect rail corridors and yards for the movement of freight and people;
  - Plan and protect for future infrastructure improvements (e.g. grade separations and rail corridor widenings); and,
  - Respect safe transportation principles. For example, the assessment of new at-grade rail crossings should consider safe community planning principles and whether other alternatives are possible, not just simply whether a crossing is technically feasible.
- Municipalities should consider and respect the plans, requirements and operating realities of rail operators and to work cooperatively with railways to increase awareness regarding the railway legislative, regulatory and operating environment and to implement consultation planning protocols and procedures for land development proposals and applications.
- Municipalities should work with railways and other levels of government to increase coordination for development approvals that also require rail regulatory approvals (e.g. new road crossings) to ensure that the respective approvals are not dealt with in isolation and/or prematurely.
- Municipalities should be aware of and implement where feasible Transport Canada's safety recommendations with respect to sightlines for at-grade crossings. [The recommendations include a minimum 30 metre distance between the railway right-of-way and any vehicular ingress/egress. In addition, trees, utility poles, mitigation measures, etc. are not to block sightlines or view of the crossing warning signs or systems].

# Understanding Stakeholder Roles and Advancing Issue Recommendations

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## 3

### 3.4 RAILWAY

- Federally regulated rail operators are guided by the requirements of the Canada Transportation Act and Canadian Environmental Assessment Act and are to minimize impacts on adjacent properties. These requirements include notifying and consulting for certain changes and plant expansions. Additionally the Railways are required to adhere to the requirements of the Railway Safety Act, which promotes public safety, protection of property and the environment in the operation of the railway.
- Rail operators also typically establish formal company environmental management practices and policies and participate in voluntary programs and multi-party initiatives such as Direction 2006, Operation Lifesaver, TransCAER and Responsible Care®.

#### **Recommendations**

Develop and/or modify company procedures and practices with respect to increased consultation and formal proximity issue management protocols with the following guidance:

- Undertake broad consultation and seek multi-stakeholder support for projects prior to seeking CTA approval. (see Appendix II);
- When new facilities are built or significant expansions are undertaken, implement on-going community advisory panel discussions with regular meetings and established operating protocols are useful to deal with stakeholder operational issues and concerns. Such panels typically include representation from the railway, the municipality, the community, other levels of government if applicable, and possibly industry; and,

- Railway initiation of long-term business and infrastructure planning exercises, in consultation with municipalities, can facilitate stronger and more effective relationships and partnerships.
- Work with municipalities, landowners and other stakeholders in evaluating and implementing appropriate mitigation measures with respect to new rail facilities or significant expansions to existing facilities, located in proximity to existing sensitive development;
- Consider and respect municipal plans, requirements and operating realities and work cooperatively with municipalities to increase awareness regarding the railway legislative, regulatory and operating environment;
- Utilize opportunities to get involved in land use planning processes and matters. Municipal planning instruments can be effective tools in implementing, or at least facilitating the implementation, of long-term rail transportation planning objectives;
- Work with industry associations and all levels of government to establish standardized agreements and procedures with respect to all types of crossings;
- Pursue finalizing and implementing the RAC Draft Railroad Noise Emission Guidelines. (See Appendix II on page 26 for more information); and,
- Support integrated transportation planning involving provincial, municipal, Port authorities and multiple railways which is critical to balancing rail capacity upgrades, minimizing community impacts and ensuring that economic benefits occur.

# Understanding Stakeholder Roles and Advancing Issue Recommendations

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## 3

### **3.5 LAND DEVELOPER / PROPERTY OWNER**

- Land developers are responsible for respecting land use development policies and regulations to achieve a livable development which considers and respects the needs of surrounding existing and future land uses.

#### **Recommendations**

- Consult with municipalities and rail operators as early as possible on development applications and proposals to ensure compliance with policies, guidelines and regulations and fulfilling obligations of development approvals; and,
- Enter into agreements with municipalities and/or rail operators as required to ensure proximity issues are addressed now and into the future. Property owners should be informed, understand, acknowledge and respect any mitigation maintenance obligations and/or warning clauses.

### **3.6 REAL ESTATE SALES/MARKETING AND TRANSFER AGENTS**

- Real estate sales people and property transfer agents (notaries and lawyers) are often the first and only contacts for people purchasing property and therefore have a professional obligation to seek out and provide accurate information to buyers and sellers.

#### **Recommendations**

- Real estate sales people and property transfer agents should ensure that potential purchasers are made fully aware of the existence and nature of rail operations and are aware of and understand the mitigation measures to be implemented and maintained.

### **3.7 ACADEMIA AND SPECIALIZED TRAINING PROGRAMS**

- Academic institutions provide training in all fields related to land use planning, development and railway engineering.

#### **Recommendations**

- These institutions should ensure their curriculums incorporate the latest research available to provide future land use planners, land developers and railway engineers with better and more comprehensive tools and practices to anticipate and prevent proximity conflicts.

### **3.8 INDUSTRY ASSOCIATIONS**

- Industry associations include bodies such as the RAC, FCM, Canadian Association of Municipal Administrators (CAMA), Canadian Institute of Planners (CIP), provincial planning associations, the Canadian Acoustical Association (CAA), and land development groups such as the Urban Development Institute.

#### **Recommendations**

- Industry associations should ensure their membership is informed of and involved in the latest research and proactively engaged in raising awareness and educating their members through seminars and other training programs.

# Dispute Resolution

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## 4

While the objective of this report is to recommend proximity guidelines and best management practices going forward to reduce the potential for future land use conflicts by implementing mitigation at the time of development/project approval, it is recognized that there are and will be historical land use conflicts that predate this report and/or the existence or utilization of other relevant guidelines. Resolution of conflicts in such scenarios may be more challenging and/or complicated, given the typical practical difficulties of implementing mitigation post-development/project approval and determining the parties responsible, if any.

The recommended proximity guidelines and best management practices contained in this report should be used to inform any dispute resolution process. With respect to noise and vibration complaints/conflicts, the following factors/protocols are recommended to be considered:

- The federal government and the Canadian Transportation Agency are encouraged to use and have regard for this report in proximity dispute investigations and in the development and implementation of any related guidelines, to facilitate a more comprehensive approach that appropriately considers the land use planning framework along with the rail operations issues.
- Relevant municipal land use approvals history should be investigated, particularly with respect to any rail noise, vibration, safety impact and warning clause requirements requested by the railway operator and/or secured by the municipality as part of development approvals. This investigation should include any relevant provincial noise policies or guidelines that the municipality had or should have had regard for at the time of development approval. In general, railways should not be expected to mitigate for bad land use planning decisions for which they had no control over.

- Should the investigation include specific noise and vibration level measurements and/or predictions, reasonable and practical approaches should be utilized, taking into consideration both maximum level limits at the source (eg. the RAC draft Railroad Emission Guidelines discussed in Appendix II on page 35 of this report) and receptor annoyance-related approaches, as appropriate to the context of the investigation. It is important to note that Table A1-1 on page 28 of this report is intended mainly for implementation in new development approvals. Dispute investigations are often more complex and multi-faceted in nature, involving several stakeholders and different legislative, regulatory and policy frameworks.
- Railway operating requirements and obligations must be respected in any dispute resolution process.

In cases when land use disputes do arise (mainly from existing situations but also from other scenarios as noted), all stakeholders are encouraged to have regard for and utilize where applicable the following local dispute resolution framework that was established by the RAC/FCM Dispute Resolution Subcommittee, adapted/modified as appropriate to the specific situation.

### ***Local Dispute Resolution Framework***

#### **A. Guiding Principles to be Observed through any form of Dispute Resolution**

1. Identify issues of concern to each party.
2. Ensure representatives within the dispute resolution process have negotiating authority. Decision making authority should also be declared.
3. Establish in-person dialogue and share all relevant information among parties.

# Dispute Resolution

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## 4

### **B. Dispute Resolution Escalation Process**

Municipal and railway representatives should attempt resolution in an escalating manner, recognizing that each of these steps would be time consuming for all parties.

1. Resolve locally between two parties. If resolution not achieved,
2. Proceed to third-party mediation/facilitation support. If resolution not achieved,
3. Proceed to other available legal steps.

### **C. Generic Local Dispute Resolution Process**

With the emphasis for resolution focused on B1 above, a common local dispute resolution model based on the generic process outlined below is recommended.

1. Face-to-face meeting to determine specific process steps to be used in resolution attempt. Community Advisory Panel formation should be considered at this point.
2. Determination of which functions and individuals will represent the respective parties. Generally this would include the municipality, the railway, and other appropriate stakeholders.
3. Issue identification.
4. Raised through community to railway. Could be the result of an unresolved outstanding proximity issue, operational modifications, or change in rail customer operation (misdirected to railway).
5. Planned railway development that MAY impact community in the future.
6. Raised through the railway to community. Could be the result of a municipal government action (rezoning, etc.)
7. Exploration of the elements of the issue. Ensure each party is made aware of the other's view of the issue – a listing of the various aspects/impacts related to the issue.

8. Consult any existing relevant proximity guidelines or related best practices (eg. this report).
9. Face-to-face meeting/s between parties representing the issue to initiate dialogue for dispute resolution process. Education, advocacy of respective positions.
10. Attempt compromise/jointly agreed solution. **If Not, proceed to step B2 above.**
11. Determine necessary internal, external communication requirements and/or requisite public involvement strategies for implementation of compromise.

## Conclusions

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### 5

This report provides the final recommendations for the rail/municipal proximity guidelines research project initiated by the Railway Association of Canada and the Federation of Canadian Municipalities. The three principle situations that are dealt with are: new land development or redevelopment in proximity to existing rail operations; new or significantly expanded rail facilities in proximity to existing residential uses and road/rail crossing issues.

A comprehensive set of proximity guidelines and best management practices has been identified in the report and appendices for consideration by stakeholders, including all levels of government, railways, developers and their consultants, property owners and academia. Topics covered include:

- Noise and vibration protocols and procedures for use in determining appropriate mitigation;
- Safety impact mitigation measures such as buildings setbacks, berms and security fencing and other trespass prevention considerations;
- Drainage considerations;
- Warning clauses and environmental easements;
- Planning to minimize the creation of new at-grade rail crossings; and,
- Implementation mechanisms to secure construction and maintenance responsibilities.

The objective of the proximity guidelines and best management practices is to inform and influence railway and municipal planning practices and procedures to more effectively anticipate and manage proximity conflicts and to better facilitate municipal and railway growth. The various stakeholders are encouraged to review and establish or update as necessary their respective planning instruments and company practices / procedures.

The next steps by respective stakeholders could include further research as appropriate and/or implementation of relevant components of the recommended development guidelines, policies and regulations.

Further consideration should also be given to imbedding these guidelines and their implementation into the curriculum of educational institutions in civil engineering, land use planning and railway engineering.

## Internet Links

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This list is far from exhaustive and is intended to provide a few useful websites that the reader should find useful.

Railway Association of Canada

**[www.railcan.ca](http://www.railcan.ca)**

(\* includes relevant government links and links to member railway sites)

Federation of Canadian Municipalities

**[www.fcm.ca](http://www.fcm.ca)**

(\* includes links to provincial affiliate associations and municipal sites)

RAC/FCM Proximity Project

**[www.proximityissues.ca](http://www.proximityissues.ca)**

Government of Canada

**[www.canada.gc.ca](http://www.canada.gc.ca)**

Transport Canada

**[www.tc.gc.ca](http://www.tc.gc.ca)**

Canadian Transportation Agency

**[www.cta-otc.gc.ca](http://www.cta-otc.gc.ca)**

Ontario Ministry of Environment

**[www.ene.gov.on.ca](http://www.ene.gov.on.ca)**

Canada Mortgage and Housing Corporation

**[www.cmhc-schl.gc.ca](http://www.cmhc-schl.gc.ca)**

Operation Lifesaver

**[www.operationlifesaver.ca](http://www.operationlifesaver.ca)**

Safe Communities

**[www.safecommunities.ca](http://www.safecommunities.ca)**

Queensland Rail

**[www.corporate.qr.com.au](http://www.corporate.qr.com.au)**

I

**AI.1**

***Recommended Procedures for the Preparation of Noise and Vibration Reports for New Residential or other Sensitive Land Uses in Proximity to Rail Corridors***

**NOISE**

1. Studies should be undertaken by a qualified consultant using an approved prediction model.
2. Where studies are not economically or practically feasible, due for example to the scale of a development or the absence of an available mechanism to secure a study, reasonable and practical measures should be undertaken to minimize potential noise impacts, such as increased building setbacks, noise fencing, and building construction techniques (e.g. brick veneer, air conditioning), etc.
3. Obtain existing rail traffic volumes from rail authority.
4. Use most current draft plan/site plan and grading plans for analysis.
5. Escalate rail traffic volume data by 2.5% compounded annually for a minimum of 10 years, unless future traffic projections are available.
6. Conduct analysis at closest proposed sensitive receptor. The minimum setback distances based on the classification of the rail line, as specified by the railway should be used for the analysis. If the closest proposed residential receptor is at the greater distance than the minimum setback distance, then the greater distance may be used.
7. The analysis needs to be conducted at the following locations:
  - Outdoor amenity area receptor. This is usually in the rear yard at a point that is 3 m away from the rear wall of the house. This is typically a daytime calculation;
  - 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> storey receptor for low rise dwellings. The nighttime calculation should be conducted at the façade where a bedroom could be located. The daytime calculation should be conducted at the façade where the living/dining/family areas could be located; and
  - If the building is a multi-storey building the calculations should be conducted at the outdoor amenity areas and at the highest floor of the building.
8. The typical receptor heights are summarized below. These are to be used as a guide only. If the actual receptor heights are known they should be used.
  - Outdoor amenity area: 1.5 m above the amenity area elevation;
  - 1<sup>st</sup> storey receptor: 1.5 m above the 1<sup>st</sup> floor finished grade elevation;
  - 2<sup>nd</sup> storey receptor: 4.5 m above the 1<sup>st</sup> floor finished grade elevation; and
  - 3<sup>rd</sup> storey receptor: 7.5 m above the 1<sup>st</sup> floor finished grade elevation;
9. The analysis should be conducted assuming a 16 hour day (LeqDay) and an 8 hour night (LeqNight).
10. If whistles are permitted they should be included in the analysis to determine the mitigation measures to achieve the indoor sound level limits. Whistles are not required to be included in the determination of sound barrier requirements.
11. Any topographical differences between the source and receiver should be taken into account.
12. The attenuation provided by dense, evergreen forest of more than 50 m in depth can also be included in the analysis (assuming it will remain intact).
13. Intervening structures that may provide some barrier effect may also be included in the analysis.



## Appendix I

# Noise and Vibration Procedures and Criteria

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I

14. The results of this analysis should be compared to the applicable sound level limits listed below to determine the required mitigative measures for both the outdoor amenity areas and the dwelling. Mitigative measures could include noise barriers, architectural and ventilation components (eg. brick veneer, air conditioning, forced air ventilation, window glazing requirements, etc.)
15. The required sound barrier heights to achieve the guidelines at the outdoor amenity areas can be determined using an appropriate model. The relative location with respect to the source and the receiver is required as well as the grades of the tracks, barrier location and receptor.
16. The sound barrier needs to be designed taking into consideration the minimum safety requirements of the railway.
17. The architectural component requirements must include the minimum requirements of the railways. The remainder of the components can be determined using the AIF procedures found in the CMHC publication, "Road and Rail Noise: Effects on Housing", (NHA 5156 08/86) of the BPN 56 procedures found in the National Research Council publication "Building Practice Note 56, Controlling Sound Transmission into Buildings", September 1995.
18. In preparing the report all of the above information must be included so that the report can be appropriately reviewed. In addition to the above the report should include the following:
  - Key plan;
  - Site plan/draft plan;
  - Summary of the rail traffic data, including the correspondence from the railways;
  - Figure depicting the location of the sound barrier, including any extensions or wrap arounds;
  - Top of barrier elevations;
  - Sample calculations with and without the sound barrier;
  - Sample calculations of how the architectural requirements were determined;
  - Summary table of lots/blocks/units requiring mitigation measures, including lots that require air conditioning and warning clauses; and
  - Any other information relevant to the site and the proposed mitigation.

**Appendix I**

**Noise and Vibration Procedures and Criteria**

**I**

**Table AI-1  
Recommended Noise Criteria  
New Residential or other Sensitive Land Uses in Proximity to Rail Corridors\***

<b>TYPE OF SPACE</b>	<b>TIME PERIOD</b>	<b>SOUND LEVEL LIMIT Leq* (dBA) Rail**</b>
Bedrooms, sleeping quarters of hospitals, nursing/retirement homes, etc.	2300 to 0700 hrs.	35
Living/dining rooms, sleeping quarters of hotels/motels, living/dining areas of hospitals, schools, nursing/retirement homes, day-care centres, places of worship etc.	0700 to 2300 hrs.	40
Individual or semi-private offices, small conference rooms, reading rooms, classrooms, libraries etc.	0700 to 2300 hrs.	40
General offices, reception areas, retail shops and stores, etc.	0700 to 2300 hrs.	45
Outdoor living areas	0700 to 2300 hrs.	55***
Outside bedroom windows and sleeping quarters	2300 to 0700 hrs.	50
Outside living/dining room windows	0700 to 2300 hrs.	55

Source: Adapted from the Ontario Ministry of Environment LU-131 Guideline.

\* Applicable to Transportation Noise Sources only.

\* Leq, measured in A-weighted decibels (dBA), is the value of the constant sound level which would result in exposure to the same total sound energy as would the specified time varying sound, if the constant sound level persisted over an equal time interval.

LeqDay is applied to a 16 hour period (0700 to 2300). LeqNight is applied to an 8 hour period (2300 to 0700).

\*\* The indoor sound level limits are used only to determine the architectural component requirements. The outside façade sound level limits are used to determine the air conditioning requirements.

\*\*\* Mitigation is recommended between 55 dBA and 60 dBA and if levels are 60 dBA or above, mitigation should be implemented to reduce the levels as close as is practicable to 55 dBA.

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**VIBRATION**

Mitigation can take the form of perimeter foundation treatment and thicker foundation walls and in more severe cases the use of rubber inserts to separate the superstructure from the foundation.

1. Studies should be undertaken by a qualified consultant.
2. Where studies are not economically or practically feasible, due for example to the scale of a development or the absence of an available mechanism to secure a study, reasonable and practical measures should be undertaken to minimize potential vibration impacts, such as increased building setbacks, perimeter foundation treatment (eg. thicker foundations) and/or other vibration isolation measures, etc.
3. Vibration measurements should be conducted for all proposed residential/institutional type developments. It is not acceptable to use vibration measurements conducted at other locations such as on the opposite side of the tracks, further down the tracks, etc.
4. The vibration measurements should be conducted at the distance corresponding to the closest proposed residential receptor, or on the minimum setbacks based on classification of the rail line. If the proposed dwelling units are located more than 75 m from the railway right-of-way, vibration measurements are not required.
5. Sufficient points parallel to the tracks should be chosen to provide a comprehensive representation of the potentially varying soil conditions.
6. A minimum of five (5) train passbys (comprised of all train types using the rail line) should be recorded at each measurement location.
7. The measurement equipment must be capable of measuring between 4 Hz and 200 Hz  $\pm$  3 dB with an RMS averaging time constant of 1 second.
8. All measured data shall be reported.
9. The report should include all of the above as well as:
  - Key plan;
  - Site/draft plan indicating the location of the measurements;
  - Summary of the equipment used to conduct the vibration measurements;
  - Direction, type, speed (if possible), number of cars of each train measured;
  - Results of all the measurements conducted;
  - Exceedance, if any; and
  - Details of the proposed mitigation, if required.
10. Ground-borne vibration transmission to be estimated through site testing and evaluation to determine if dwellings within 75 metres of the railway right-of-way will be impacted by vibration conditions in excess of 0.14 mm/sec. RMS between 4 Hz. and 200 Hz. The monitoring system should be capable of measuring frequencies between 4 Hz and 200 Hz  $\pm$  3 dB, with an RMS averaging time constant of 1 second. If in excess, appropriate isolation measures are recommended to be undertaken to ensure living areas do not exceed 0.14 mm/sec. RMS on and above the first floor of the dwelling.

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**AI-2**

***Recommended Procedures for the Preparation of Noise Reports For New Residential or other Sensitive Land Uses In Proximity to Freight Rail Shunting Yards***

1. Studies should be undertaken by a qualified consultant.
2. Where studies are not economically or practically feasible, due for example to the scale of a development or the absence of an available mechanism to secure a study, reasonable and practical measures should be undertaken to minimize potential noise impacts, such as increased building setbacks, noise fencing, building construction techniques (e.g. brick veneer, air conditioning), etc.
3. Obtain information from the railway regarding the operations of the freight rail yard in question. This information should include existing operations as well as potential future modifications to the rail facility.
4. Obtain minimum sound levels to be used for each source from railway, if available. These data should also be verified by on-site observations and on-site sound measurements.
5. Calculate the potential impact of all the sources at the closest proposed residential receptor. This should be at a minimum of 300 m from the closest property line of the freight rail yard.
6. The analysis should be conducted for the worst case hour (Leq 1hr).
7. The calculation may be conducted using ISO 2613-2 or other approved model.
8. Impulsive activities, such as train coupling/uncoupling and stretching should be analyzed using a Logarithmic Mean Impulse Sound Level ( $L_{LM}$ ) and not included as part of the 1 hour Leq.
9. The analysis may include any attenuation provided by permanent intervening structures as well as vegetation as set out by the prediction model. Topographical differences between the source and receiver should be taken into account.
10. Any tonal characteristics of the sound should be taken into consideration.
11. All analyses should take the proposed grading of the site as well as the grading at the rail yard, particularly when determining the sound barrier heights.
12. The source positions should be determined in consultation with the railway. They should be based on the most likely and reasonable location for that activity.
13. The consultant report shall include the following:
  - Key plan;
  - Site plan/draft plan of the proposed development;
  - Figure depicting the location of each of the sources modelled within the rail yard;
  - Summary table of the source sound levels used in the analysis;
  - Results of the predicted sound levels at various receptors;
  - Results of any on-site sound measurements;
  - Sample calculations with and without any proposed mitigation;
  - Summary table of all lots requiring mitigation;
  - Top of sound barrier elevations, if sound barriers are proposed; and
  - Any other information relevant to the site and the proposed mitigation.
14. The results of the analysis should be compared to the following sound level criteria in Table A-2 on page 25. Where an excess exists, mitigation that conforms to applicable stationary source guidelines should be recommended.

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**Table AI-2****Recommended Noise Criteria – Residential or other Sensitive Land Uses in Proximity to Freight Rail Shunting Yards****Minimum Values for One Hour  $L_{eq}$  or  $L_{LM}$  By Time of Day**

Time of Day	One Hour $L_{eq}$ (dBA) or $L_{LM}$ (dBAI)	
	Class 1 Area	Class 2 Area
0700 – 1900	50	50
1900 – 2300	47	45
2300 – 0700	45	45

Source: Adapted from the Ontario Ministry of Environment LU-131 Guideline.

These criteria are applicable to any usable portion of the lot or dwelling.

**AI-3****Recommendations for Evaluation of New Rail Facilities or Significant Expansions to Existing Rail Facilities in Proximity to Residential or other Sensitive Land Uses**

- Evaluations of proposed physical expansion/modifications to a rail facility should be, based on the specific site and operational characteristics and would be conducted in accordance with applicable federal requirements. The procedures should be similar in nature to those outlined for proposed sensitive land-uses in proximity to a rail facility.
- The numerical criteria that would establish the need for mitigation should also consider a change assessment – that is, considering and comparing by what amount the sound levels are expected to change (the pre-project vs. the post-project sound levels).
- Mitigation should be considered when the predicted future sound level including the project and the ambient<sup>3</sup> noise exceed the future no-build, including ambient<sup>3</sup> sound level by 5 dB or more. The assessment, implementation and extent of mitigation should take into account applicable adjacent land use approvals (eg. whether newer residential uses have been permitted to encroach on the rail corridor or yard without appropriate mitigation) and should be evaluated based on operational, economic, technical and practical feasibility, and in all cases undertaken in accordance with applicable regulations. Mitigative measures, if applicable, would be expected to take the form of sound barriers, modified alignments and/or modified operations, where feasible.

3. Where rail is the dominant noise source, it should be included in the ambient.

## Examples of Best Management Practices

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# II

### ***AII-1 DRAFT RAILROAD NOISE EMISSION GUIDELINES, RAC***

The Railway Association of Canada has prepared Draft Noise Emission Guidelines that will assist in controlling noise emitted by moving rail cars and locomotives.

- The RAC initiative is the first attempt at such a guideline in Canada. Federal agencies have indicated that they support the RAC's efforts and look forward to working with all stakeholders on such initiatives and also that they encourage a blend of maximum levels of noise and annoyance-related approaches in the development of such guidelines.
- The RAC guidelines are based on the following United States Codes of Federal Regulations (CFR): CFR Title 40 - Protection of Environment - Part 201 Noise Emission Standards for Transportation Equipment; Interstate Rail Carriers – July 1, 2002; and, CFR Title 49 Transportation – Part 210 Railroad Noise Emission Compliance

Regulations – Oct 1, 2002.

- The guidelines apply to the total sound emitted by moving rail cars and locomotives (including the sound produced by refrigeration and air conditioning units that are an integral element of such equipment), active retarders, switcher locomotives, car coupling operations, and load cell test stands, operated by a railroad within Canada. There are exceptions where the guidelines do not apply, including steam locomotives, sound emitted from warning devices, special purpose equipment, and inert retarders.
- Railways, and the RAC, are encouraged to continue with proactive efforts and partnerships to undertake research and education initiatives that build on and improve the draft noise emission guideline, including incorporating aspects of the subject research.

A summary of the guidelines is on the following page.

## Appendix II

# Examples of Best Management Practices

# II

Noise source	Noise Guideline - A- weighted sound level in dB	Noise Measure	Measurement location
<b>All locomotives manufactured on or before Dec. 31, 1979</b>			
Stationary, Idle Throttle setting.	73	Lmax (slow)1/	30 m
Stationary, all other throttle settings	93	Lmax (slow)	30 m
Moving	96	Lmax (fast)	30 m
<b>All locomotives manufactured after Dec. 31, 1979</b>			
Stationary, Idle Throttle setting.	70	Lmax (slow)	30 m
Stationary, all other throttle settings	87	Lmax (slow)	30 m
Moving	90	Lmax (fast)	30 m
Additional req't for switcher locos manufactured on or before Dec. 31, 1979 operating in yards where stationary switcher and other loco noise exceeds the receiving property limit of.	65	L90 (fast)2/	Receiving property
Stationary, Idle Throttle setting.	70	Lmax (slow)	30 m
Stationary, all other throttle settings	87	Lmax (slow)	30 m
Moving	90	Lmax (fast)	30 m
<b>Rail Cars</b>			
Moving at speeds of 45 mph or less	88	Lmax (fast)	30 m
Moving at speeds greater than 45 mph	93	Lmax (fast)	30 m
<b>Other Yard Equipment and Facilities</b>			
Retarders	83	Ladjavemax (fast)	Receiving property
Car-coupling operations	92	Ladjavemax (fast)	Receiving property
Loco load cell test stands, where the noise from loco load cell operations exceeds the receiving property limits of.	65	L90 (fast)2/	Receiving property
Primary Guideline	78	Lmax (slow)	30 m
Secondary Guideline if 30 m measurement not feasible	65	L90 (fast)	Receiving property located more than 120 m from Load Cell

1/Lmax= maximum sound level

L90= statistical sound level exceeded 90% of the time

Ladjavemax= adjusted average maximum sound level

2/ L90 must be validated by determining that L10-L99 is less than or equal to 4 dB (A).

Receiving property essentially means any residential or commercial property that receives sound (not owned by the railroad).

# II

## **AII-2 DIRECTION 2006**

Community Trespass Prevention is an initiative of Direction 2006, a Government of Canada and public/private partnership initiated in 1996, with the goal of cutting the number of accidents and fatalities in half within 10 years, by 2006. As part of this initiative, the document *Trespassing on Railway Lines: A Community Problem-Solving Guide* was developed. This document describes the Community, Analysis, Response and Evaluation (C.A.R.E.) problem-solving model that was developed to assist communities in identifying and addressing the underlying causes of trespassing. It provides a step-by-step method of identifying, analyzing and effectively addressing trespassing issues in the community.

Direction 2006 has identified four areas of concentration (the four E's) with respect to crossing and trespass prevention, namely:

### **Education**

Operation Lifesaver's success as a safety program lies in educating people of all ages about the dangers of highway/railway crossings and the seriousness of trespassing on railway property. The methods used to reach the public include the production and distribution of educational related material, early elementary and driver education curriculum activities, civic presentations, as well as media coverage.

### **Enforcement**

Laws are in place governing motorists' and pedestrians' rights and responsibilities at highway/railway crossings and on railway property. Without enforcement, however, they will be ignored and disregarded, and incidents will continue to happen. Therefore, provincial and municipal law enforcement agencies are urged to deal with motorists and pedestrians who disregard these laws and jeopardize their lives as well as the lives of others.

### **Engineering**

Highway/railway crossings, railway property and pedestrian crossings must be kept safe, both physically and operationally, and improvements must be made when needed. To ensure a high level of safety, the administrative process of improving railway rights-of-way needs to be reviewed and changed when needed. At the same time, the public needs to be made more aware of federal, provincial and other programs aimed at improving railway safety.

### **Evaluation**

To maintain the quality of Operation Lifesaver, its effect should be measured against its stated goals. Funds are available for technical and program assistance.

Lessons that can be learned from Direction 2006 include:

- The benefits of multi-stakeholder initiatives to raise awareness of public safety matters and reduce the potential for future incidents.
- Promotion of rail safety improvement, particularly improvement and elimination of at-grade crossings and provision of funding for safety initiatives.

## **AII-3 NEW ROAD CROSSING**

An example of a recent grade-separation crossing is Enterprise Drive (currently under construction) at the GO Transit Uxbridge Subdivision in Markham, Ontario. The alignment for Enterprise Road was established as part of a planning process in developing the Markham Downtown area and was subsequently included in the Official Plan and associated secondary plans. The road alignment was also identified in a comprehensive area transportation study, the Markham Transportation Planning Study.

As this was a new road, it was subject to a Municipal Class Environmental Assessment



## Appendix II

# Examples of Best Management Practices

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**II** (Class EA). Initially, an at-grade railway crossing was considered. The Class EA determined that due to anticipated traffic levels, a planned bus higher order transit alignment and community planning/ urban design factors, the crossing of the rail line required a grade separation. As part of the requirement for the Class EA, alternative solutions and designs were examined.

Throughout this planning process, the Town of Markham consulted with GO Transit and sought input with respect to the new crossing and the overall area development.

Upon completion of the planning studies, the Town of Markham coordinated the grade separated crossing design, diversion track planning and executed a crossing agreement with GO Transit to enable a rapid implementation of the grade separation.

The best practices in terms of creating new rail crossings that were demonstrated in the case study include:

- i. Undertaking of comprehensive community and transportation planning studies to establish need and justification for a new crossing.
- ii. Undertaking transportation studies to assess alternative methods to addressing transportation requirements and alternatives to creating a new crossing.
- iii. Taking into consideration both community safety and transportation requirements and taking a long-term approach to planning new rail crossings.
- iv. Consultation with rail corridor owner throughout early planning stages to implementation.

### **AII-3 CODE OF PRACTICE, RAILWAY NOISE MANAGEMENT, QUEENSLAND RAIL**

Queensland Rail (QR), an Australian government owned corporation, has developed a *Code of Practice for Railway Noise Management*. The *Code of Practice* is generally a self-imposed set of rules to achieve compliance with the duty to mitigate environmental impacts such as noise and vibration. The self-regulation is similar to the approach to the environment that has been adopted by the Class 1 and other railway companies in Canada.

As part of this *Code of Practice*, QR has developed a "Network Noise Management Plan" that initially involves conducting a statewide noise audit. If "potential noise-affected receptors" are identified then a detailed noise assessment is carried out. Mitigation measures will be implemented where noise levels exceed the EPP levels or if QR cannot achieve compliance with these levels, the railway will strive to comply with QR nominated interim noise levels of 70 dB(A) (24-hour average equivalent continuous A-weighted sound pressure level) and 95 dB(A) (single event maximum sound pressure level).

QR has prepared and made available to Queensland local governments "QR Guidelines for Local Governments (and/or other Assessment Managers under the Integrated Planning Act) Assessing Development Likely to be Affected by Noise from the Operation of a Railway or Railway Activities". These guidelines encourage Queensland local governments to apply noise impact assessment to development applications requiring assessment under the Integrated Planning Act and which are intended to be located near a railway. The noise impact assessment may require the imposition of conditions on the development to help achieve the required noise levels. Conditions may include devices such as sealed windows and/or double glazing; minimizing the window

## Appendix II

# Examples of Best Management Practices

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**II** area facing a noise source; barriers for low level receivers; effective building orientation; or provision of a suitable buffer distance.

Although the Canadian environment differs somewhat from QR (the main difference being that QR is government owned), there are lessons that can be learned, including:

- QR has developed a comprehensive “Network Noise Management Plan” and carries out a detailed noise assessment if potential noise-affected receptors are identified.
- QR has prepared noise impact assessment guidelines to assist local governments in applying guidelines to development applications. The guidelines are comprehensively applied.