# CITY OF HAMILTON
## PUBLIC WORKS DEPARTMENT
## Transportation Division

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| **TO:** | Mayor and Members<br>General Issues Committee |
| **COMMITTEE DATE:** | March 19, 2014 |
| **SUBJECT/REPORT NO:** | Waterdown Aldershot East-West Transportation Corridor - Noise and Lighting Mitigation (PW08063d) - (City Wide) (Outstanding Business List) |
| **WARD(S) AFFECTED:** | City Wide |
| **PREPARED BY:** | Alan Kirkpatrick<br>(905) 546-2424, Extension 4173 |
| **SUBMITTED BY:**<br><br>**SIGNATURE:** | Gerry Davis, CMA<br>General Manager<br>Public Works Department |

### RECOMMENDATION

(a) That the City of Hamilton adopts the approved Ministry of Environment - *"Environmental Noise Guidelines - NPC 300" (August 2013)* and utilize these guidelines in the planning, design and maintenance of City facilities and infrastructure;

(b) That the City continues to use the ANSI/IESNA RP-08 American National Standard Practice for Roadway Lighting and the Transportation Association of Canada - Roadway Design Guide to define and maintain street lighting standards;

(c) That the Outstanding Business List item related to Waterdown Aldershot East-West Transportation Corridor - Noise and Lighting Mitigation be identified as complete and removed from the list.

### EXECUTIVE SUMMARY

Staff has been asked to report back on the status of Noise Guidelines and Streetlight Guidelines related to a resident's concerns during the Parkside Drive - Environmental Assessment (EA) process back in 2010. Staff has been following the Ministry of the Environment's (MOE) Environmental Noise Guideline NPC-300, which applies to stationary sources, such as industries, and to transportation sources of noise, including road, rail and air traffic. The objective of the guideline is to address the proper control of sources of noise emissions to the environment. A copy of the new Ministry of the Environment - Environmental Noise Guideline NPC-300 (August 2013) is included in Appendix "A" of this report.

The City does not have an approved policy or guideline relating to Transportation-related noise protection and mitigation, but has been using the previous MOE Guidelines. In addition, guidelines related to acceptable noise levels are included in the City's Urban Hamilton Official Plan (UHOP). No substantial changes have been made to the MOE guidelines that would change what the City has been using with respect to noise.

Generally, the City does not get involved with noise attenuation on City property because the noise levels on City roads do not exceed the guideline levels. Also, in general, the City does not support the installation of noise attenuation features, i.e. noise walls, on City property because they become a financial liability for future operating and maintenance needs that these facilities require, particularly noise walls. The Urban Hamilton Official Plan states noise mitigation measures shall avoid the use of noise walls and that they only be considered when no other noise mitigation measure is practical or feasible and the long term maintenance for replacement has been addressed. Noise attenuation features can be approved for use for private property where the operation and maintenance are the responsibility of the property owner.

The exception to this is the noise walls that have been constructed along the Lincoln Alexander Expressway and Red Hill Creek Expressway which is a City owned transportation facility. The noise adjacent to a highway can exceed the noise levels in the guidelines and therefore noise walls were installed to mitigate noise impacts to adjacent properties. The provision of noise attenuation was also a condition of the project approval. The Ministry of Transportation (MTO) also provides noise barriers adjacent to their transportation facilities. This is the case on sections of Highway 403 in Ancaster and along the Service Roads adjacent to the QEW.

Potential obtrusive lighting will be taken into consideration at the time of detailed design and mitigation measures, if required, will be incorporated in the final approved design. Tools are available to redirect streetlight to the desired location and minimize spillage onto private property or utilize new light fixtures, i.e. LED fixtures to provide the desired level of lighting.

The noise and streetlighting issues raised in 2010 related to the proposed reconstruction of Parkside Drive. Local resident's concerns have been documented during the Environmental Assessment (EA) process and will be further addressed during the detailed phase of the project. A commitment has been made that: *"as part of the East-West Road Corridor to build a noise-attenuation fence on Parkside Drive behind homes on Fellowes Crescent. The exact length and location of the fence will be determined during detailed design"*.

***Alternatives for Consideration - See Page 7***

**FINANCIAL - STAFFING - LEGAL IMPLICATIONS**

Financial:

In the case of new road construction/reconstruction, any costs related to the installation of approved noise or street light mitigation measures would be included in the capital

cost of the project. If approved noise mitigation or street light trespass mitigation measures are installed if an adjacent road is not to be reconstructed, the cost to install the measure would be included in an appropriate capital budget and considered during the budget deliberation process. For noise mitigation measures owned by the City or on City property, future maintenance of the measures would also need to be taken into consideration and included in the Public Works Operations and Maintenance capital and current budget. There is no change to the current process the City has been currently using.

Where it is the decision of City Council not to include noise mitigation barriers in the road project, residents may consider pursuing the construction of a noise barrier on their private property. Cost estimates for "typical" noise wall-style mitigation measures include:

- $200/m for a 1.8 - 2.4m wood noise fence
- $450-600/m for a 1.8 - 2.4m concrete barrier

If light pollution mitigation measures are required to address existing installations, a variety of different measures may be applied for remediation. Mitigation strategies would be reviewed in context to the complaint and to the sidewalk and roadway lighting requirements – remediation strategies are location dependent and cannot be addressed holistically. Typically, mitigation measures may include removal, relocation or replacement/upgrading of existing street lighting infrastructure. Cost estimates for the installation of "typical" street lighting poles are $3,800 each. Pole relocation costs are approximately $3,000 each. Replacing a luminaire to a cut-off style luminaire to distribute/direct street lighting to/away from a specific location is approximately $500 each. These are standards practices the City currently uses.

Staffing: N/A

Legal: N/A

## HISTORICAL BACKGROUND

On June 23, 2010, Council approved the following staff direction:

That staff be directed to report back to the Public Works Committee on the following:

(i) A comprehensive evaluation/policy framework on existing development, relative to noise mitigation and lighting and what criteria would be involved.
(ii) Policy and financial implications related to potential noise and light mitigation to benefit existing residents and areas where road infrastructure works are proposed.

At the Public Works Committee meeting on June 14, 2010, a Waterdown resident who was adjacent to Parkside Drive provided a presentation explaining his problems and goals and provided the Committee with photos of the proximity of the back of his residence and others to Parkside Drive, and the anticipated impacts as a result of the road widening, including noise and light levels. The goals of his presentation was to mitigate the noise level growth with noise mitigation fencing, to move the roadway centre back to the current centre line and to mitigate light pollution from light poles on

the bedroom windows and outdoor living space. As the EA for Parkside Drive has been completed the issues raised have been dealt with and reported on, including*: "as part of the East-West Road Corridor to build a noise-attenuation fence on Parkside Drive. The exact length and location of the fence will be determined during detailed design"*

While noise levels are typically the by-product of many sources (e.g. aircraft, railways, roadway, industrial land uses, other stationary sources, etc.), the noise issues the City typical becomes involved with are road-related. The City should utilize the guidelines established by the MOE as they are deemed practical, defensible and relevant for the application in the City of Hamilton. The City's practice has been to utilize the MOE Noise Standard guidelines when designing roads in the City and when requiring the private sector to provide roads through subdivision agreements that the City later assumes.

Noise Assessment is a standard component of an Environmental Assessment (EA) study to forecast the anticipated level of noise that may result from new projects. The EA process requires forecasting of noise typically from adjacent roadways and if the anticipated noise levels exceed that acceptable level, noise mitigation measures are recommended.

If noise mitigation measures are required, as identified through the EA process, they are included in the construction of the new roads or road widening projects. If the sensitive land use development exists, the noise mitigation measures can be more difficult to address but typically include features such as trees, berms and/or noise walls.

The design standards for street lighting have been based upon accepted national and international lighting standards, namely the Illuminating Engineering Society of North America - ANSI/IESNA RP-08 American National Standard Practice for Roadway Lighting and the Transportation Association of Canada - Guideline for Roadway Lighting. Both lighting standards ensure the consistent application of lighting, maximizing the objectives of lighting, yet minimize impacts and costs by not over-lighting or lighting areas that are not required to be lit.

Potential obtrusive lighting is considered at the time of detailed design and mitigation is incorporated into the final constructed configuration. If obtrusive lighting complaints are identified post construction, these are reviewed and addressed by staff case-by-case as the cause and mitigation techniques vary greatly from location to location. The City is moving toward the installation of LED fixtures that are advantageous because they are both energy efficient and their light distribution can be more defined and reduce light spillage.

In 2013, the City standardized on the use of LED street lighting fixtures for both construction/reconstruction and maintenance replacements. Light output from LED street lights is more controlled than its predecessor and therefore the potential for light trespass is substantially reduced. Replacing existing street lights with LED street lights is also a light trespass mitigation measure.

## POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

Official Plan

The Urban Hamilton Official Plan (UHOP) includes statements regarding issues of noise and vibration emissions. The UHOP provides goals and objectives in Chapter B – "Communities", to be considered as the City develops and infill projects are implemented. Noise and vibration matters are considered when changes are being proposed and new facilities/services are being considered.

The UHOP provides the following statements concerning noise and vibration matters; *"Noise mitigation shall avoid the use of noise walls wherever possible. Preferred noise mitigation measures shall be spatial separation, building Orientation, and earth berms. Berms or berm/wall combinations shall be preferred over walls alone".*

Other related references to noise mitigation in the UHOP are included in Appendix "B" of this report.

The UHOP includes statements related to the desire/necessity for street lighting, but does not make any direct references to light trespass/light pollution.

Related references to street lighting in the UHOP are included in Appendix "C" of

this report.

The recently approved Pedestrian Mobility plan also includes many recommendations related to the necessity of adequate and/or enhanced street lighting, but similar to the UHOP, light trespass is not discussed.

Noise

Modifications to existing City roads (e.g. widening, intersection improvements, etc) or construction of new City road must meet the requirements of the Ontario Environmental Assessment (EA) Act. Municipal projects typically are carried out in accordance with the Municipal Class EA Process. As part of an EA Study, a noise impact assessment is normally carried out where a City road is widening or constructed adjacent to an existing Noise Sensitive Area (NSA). A noise impact assessment must be carried out in conformity with the Ministry of the Environment (MOE) / Ministry of Transportation (MTO) Noise Protocol. The City is responsible for reviewing the potential noise impacts from the City road undertaking and identifying the need for noise mitigation as required. The determination of potential noise impacts including the justification for whether or not noise mitigation is to be provided, must be documented in a Noise Report, which is included as an appendix in the EA Report for the City road undertaking.

Noise Assessment Procedures

Consideration of potential noise problems should commence as early as possible in the planning process with the objective of providing noise mitigation while minimizing the use of noise barriers.

The method for calculating noise levels will be in accordance with the approved MOE Guidelines, through the use of the Ontario Road Noise Analysis Method for

Environment and Transportation. The method for calculating noise levels will be in accordance with the MOE Guidelines.

Implementation and Maintenance

If noise mitigation features are approved by City Council, the location, design, and construction of the noise barrier will be undertaken by the City. The City will be responsible for the ownership and maintenance of the noise mitigation features on City property. This is an important matter when considering the installation of noise mitigation features with regard to the long-term maintenance aspect of this City asset.

Street Lighting Standards

The City does not have a street lighting policy but relies upon lighting standards set by the Illuminating Engineering Society of North America (IESNA) and the Transportation Association of Canada (TAC). Similar to the City of Hamilton, most municipalities in Canada do not have street lighting standards but rely upon IES and TAC to define and maintain standards used for street lighting.

The lighting standards used by the City for street lighting design are:

- ANSI/IES RP-08 - American National Standard Practice for Roadway Lighting
- Transportation Association of Canada - Roadway Lighting Design Guide

In 2010 the City completed a study entitled the "Comprehensive Outdoor Lighting Study" which investigated and validated outdoor lighting practices, including making recommendations for street lighting standards. The study recommended that the City should continue its current practice of using street lighting standards defined by IES and TAC.

The above noted standards do not prescribe minimal light trespass values, but rather prescribe adequate lighting level values for where lighting is needed (sidewalks, roadways, bikeways, etc). By default, the lighting of areas that are not required to be lit, such as private property, is considered to be an inefficient or poor lighting design. Both standards provide design guidelines as to how best mitigate, through the lighting design process, obtrusive lighting.

Even when obtrusive lighting may exist, the reduction or elimination of light trespass cannot take precedence over base street lighting requirements as public safety (on municipal right-of-ways) may be compromised.

Light Trespass Identification and Mitigation

Obtrusive lighting impacts for planned installations is taken into consideration at the time of detailed design and mitigation measures, if required, are incorporated in the final approved design. Street lighting is designed by using computer software which models the projected lighting conditions, and at this stage potential light trespass issues can be identified and addressed well in advance of installation. Various design considerations and tools are available to address potential light trespass issues such as adjustments to initial street light orientation/aiming, redirection of street lights (to minimize spillage onto

private property) or utilize street lighting fixtures which have increased light output control, i.e. LED fixtures.

Investigating, identifying and measuring existing obtrusive lighting can be difficult as it can be a subjective issue. Where obtrusive lighting can be clearly identified, such as light trespass onto private property, staff can take measurements with luminance meters. Measurement can provide context to the staff as to how much light is present and in which locations. Measuring after mitigation measures have been applied can quantitatively demonstrate that the measures have been successful. Some types of obtrusive lighting, such as sky glow and glare can be impossible to quantify. In the case of glare, in some instances, the presence of obtrusive lighting is very obvious (such as a street light directly adjacent to a window) and measurement is not necessary.

**RELEVANT CONSULTATION**

Staff in the Engineering Design Sections of Public Works and Planning and Growth Management, Streetlight Design Section of Public Works and staff involved in the previous Parkside Drive EA was consulted in the preparation of this report and staff in both Public Works and Planning and Economic Development when dealing with Noise Guidelines and Streetlight guidelines in the future.

**ANALYSIS AND RATIONAL FOR RECOMMENDATION**

The approved Ministry of Environment *"Environmental Noise Guideline; Stationary & Transportation Sources - Approval and Planning - NPC 300* should be utilized by staff and stakeholders during relevant project design phases and included in related Environmental Assessments. If traffic projections indicate that noise levels are forecast to be higher than the levels identified in the Environmental Noise Guidelines, the road construction design will include approved measures to mitigate the noise to the policy/guideline level. Any approved noise mitigation features will be included in the overall capital cost of the reconstruction project. The MOE guidelines are deemed practical, defensible and relevant for the application in the City of Hamilton.

The Illuminating Society of North America ANSI/IESNA RP-08 - American National Standard Practice for Roadway Lighting and the Transportation Association of Canada - Roadway Lighting Design Guide should be utilized by staff and consultants working on behalf of the City and/or developers to set the standards for street lighting. Recommendations contained in the two standards, related to obtrusive lighting, should be utilized to assist in preventing and mitigating obtrusive lighting. The IES and TAC standards have credibility with the courts and as such are well accepted and widely used by municipalities in Canada.

**ALTERNATIVES FOR CONSIDERATION**

Council could choose not to utilize the MOE approved Environmental Noise Guidelines NPC 300 (August 2013), to evaluate transportation-related noise issues in the City and continue to apply best practices only use the material provided in the City's UHOP to guide noise analysis and evaluations.

In addition, Council could chose not to continue its current practice regarding the utilization of the ANSI/IESNA RP-08 American National Standard Practice for Roadway Lighting and the Transportation Association of Canada – Roadway Design Guide. Also, Council could chose alternative methods of dealing with light trespass such as the complete removal of individual street lights, or the complete removal of multiple street lights.

## ALIGNMENT TO THE 2012 - 2015 STRATEGIC PLAN

### Strategic Priority #3

Leadership & Governance

*WE work together to ensure we are a government that is respectful towards each other and that the community has confidence and trust in.*

### Strategic Objective

3.1 Engage in a range of inter-governmental relations (IGR) work that will advance partnerships and projects that benefit the City of Hamilton.

## APPENDICES AND SCHEDULES ATTACHED

Appendix “A” Ministry of the Environment - Environmental Noise Guideline; Stationary & Transportation Sources - Approval and Planning Publication NPC-300

Appendix “B” References in the City’s Official Plan (UHOP) to Noise

Appendix “C” References in the City’s Official Plan (UHOP) to Street lighting