

EXECUTIVE SUMMARY

Of all the pollutions affecting the natural environment, light pollution is likely the most easily remedied. Simple changes in lighting design and installation yield immediate changes in the amount of light spilled into the atmosphere. Yet as urbanization and development have increased, artificial lighting has proliferated without regard for these simple measures. The interference of light pollution from such instances have been shown to impact many aspects of the natural and human environment including wildlife, stargazing, human safety, community character and professional astronomy; in addition to simply wasting energy.

This report explores how light pollution is being managed through the implementation of light pollution abatement by-laws within municipalities in the province of Ontario, Canada. It is a comparative case study of three local bylaws including Mississippi Mills *By-Law No. 03-62*, Township of Central Manitoulin *By-Law No. 2003-16*, and the Municipality of Whitestone *By-Law No. 16-2006*. In particular, these findings will be used to provide recommendations for drafting a light pollution abatement by-law in the Township of Stone Mills where sustainability and protection of the Lennox and Addington County Dark Sky Viewing Area are of utmost importance. Astronomers regard this Township as the most southerly point in Ontario (see Figure 1) where the night sky is still clearly visible.



Figure 1. Location of the Township of Stone Mills, Ontario. (Google Maps)

This report addresses one research question: **What approaches learned from other municipal light pollution abatement by-laws are relevant to implementation in the Township of Stone Mills to effectively manage light pollution?**

In order to answer the research question and to develop recommendations for the Township of Stone Mills, the three municipal by-laws were analyzed and compared to understand the different approaches to designing and implementing light pollution abatement bylaws. The criteria used to evaluate the by-laws was based on a model developed by the Law Reform Commission of Saskatchewan which looked at existing legislation in Canada and the US including: the Royal Astronomical Society of Canada's model by-law, as well as works drafted in New Hampshire (*Proposal for a State of New Hampshire Outdoor Lighting Control Ordinance*), Iowa (*Iowa Standards for Outdoor Lighting*) and Indiana (*Framework for Outdoor Lighting Improvement Ordinances*), among others, to determine a set of common features present in all drafted legislation.

The key by-law components were identified as follows:

1. Intensity Control
2. Shielding Requirements
3. Light Trespass
4. All-Night Lighting
5. Prohibitions
6. Exemptions
7. Penalties/Enforcement

Overall, the majority of the seven by-law categories were apparent within each by-law in some form. From the document analysis, a set of recommendations was derived for the Township of Stone Mills in developing an effective light pollution abatement by-law that best fits the rural character of the community and upholds the intent of such a by-law. The key recommendations of each category are as follows:

- **Intensity Control** - Clear and measurable requirements for intensity based on IESNA recommendations should be prominently included.

- **Shielding Requirements** - Include a visual appendix with examples of acceptable and unacceptable lighting fixtures, and shielding solutions for existing fixtures.
- **Light Trespass** - Keep language at a high level, but include language that highlights the impacts of light trespass to raise awareness of the issue.
- **All-Night Lighting** - Restrict outdoor lighting other than security lighting between 11pm and sunrise.
- **Prohibitions** - Consider developing a special set of considerations for the area around the Lennox and Addington County Dark Sky Viewing Area.
- **Exceptions** - Keep exceptions high level and minimal. Examples of common exceptions include: low intensity lighting, sports facilities (when not in use) and airport or other navigational lighting.
- **Penalties/Enforcement** - Utilize a citizen-friendly approach to regulation; such an approach may make municipal staff available to assist in working with the violator to address the issue or provide extra time for compliance if warranted.

Although these recommendations provide a starting point for developing a light pollution abatement by-law in Stone Mills, further research would enable the development of an all encompassing strategy. In addition to conducting interviews and looking at a wider variation of case studies, other topics that warrant additional research include: local regulation versus a provincial/national approach to light pollution; alternative solutions to addressing light pollution; evaluating enforcement versus advocacy and education programs; and challenges in addressing light pollution in rural versus urban settings.

The Township of Stone Mills is in an excellent position to create a light pollution abatement by-law that protects the health and integrity of the area's night sky, because the Township is home to the County's Dark Sky Viewing Area and has a keen interest in sustainability. Applying these recommendations is an important next step to ensuring that the community continues to move towards achieving a sustainable night environment for future generations.