



Meeting Date: October 27, 2021

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Report No: PWE 32-2021

Subject: Municipal Lighting

Recommendation:

THAT Report PWE 32-2021, re: Municipal Lighting be received;

AND THAT Council confirms utilization of existing standards and By-laws as it relates to Municipal Lighting.

Purpose:

The purpose of this report is to provide an overview of existing by-laws, standards, and documents pertaining to lighting within the Municipality of Middlesex Centre

Background:

Council resolved on April 28, 2021 the following;

“WHEREAS the appropriate standards and effective management of illumination in Ontario communities is a topic of increasing interest to many groups and individuals;

AND WHEREAS the best practices and industry standards for surrounding effective illumination practices are changing with the introduction of new green technologies which promote energy conservation as part of effective lighting techniques;

AND WHEREAS Municipalities have the authority to enact by-laws and policies which help to standardize and promote effective lighting practices.

NOW THEREFORE IT BE RESOLVED THAT staff review the current research, industry standards and best practices with regard to Municipal illumination standards

AND THAT staff is to explore factors including, but not limited to cost efficiencies, impacts on security and safety, and opportunities to improve quality of life for residents, when undertaking this review;

AND FURTHER THAT, a report to Council outlining the potential costs and benefits related to any proposed recommendations regarding implementation of municipal illumination standards over time be presented to Council once the review is complete.”

Analysis:

Sources of lighting within the municipality can be broken down into a few groups as follows; street lighting, municipal facility lighting, parks and field lighting, and lighting from private property.

The purpose of street lighting is to reduce night-time vehicular crashes by improving visibility, reduce pedestrian crashes and provide visibility for vulnerable road users, and help to aid in navigation. Street lighting also helps people to feel safe and can help to reduce crime.

The purpose of municipal facility lighting is to provide security, provide increased visibility at night to users of municipal facilities (arenas, library's, municipal office, etc.) and aid in navigation to municipal facilities.

The purpose of parks and field lighting is to allow for longer playing hours on municipal sports fields, provide security for parks users and to help limit and prevent crime.

Lighting on private property can be for numerous reasons ranging from security and crime prevention to purely aesthetic architectural or façade lighting.

The industry standard and best practice for street lighting is the RP-800 standard published by the Illuminating Engineering Society (IES) of North America, this standard takes into account various roadway and pedestrian conditions based on user volumes and roadway context and provides recommendations on appropriate light levels measured in lux and illuminance. The RP-800 standard has recently undergone a major review and re-write changing how streetlight design is undertaken with corresponding changes to the required amount of illumination for various scenarios. The change in design standards and best practices can be seen in the Melrose Street light Design that was recently completed to replace old and failing street light infrastructure. Through the design process it was found that to meet the industry accepted lighting standards of today would see an approximate doubling of the number of street light poles and fixtures to provide adequate lighting levels. This doubling is primarily due to changes in lighting uniformity that reduces the variation between dark and bright spots providing a more consistent level of lighting which minimises eye strain and minimizes the amount of time the human eye requires to adjust to light and dark where visibility may be impacted. Street lighting design and requirements for the municipality are contained in the Municipality's Design Standards Manual and are updated periodically to conform to industry best practices. All municipal street lighting is LED lighting providing the most cost effective and lowest operating cost lighting in the industry.

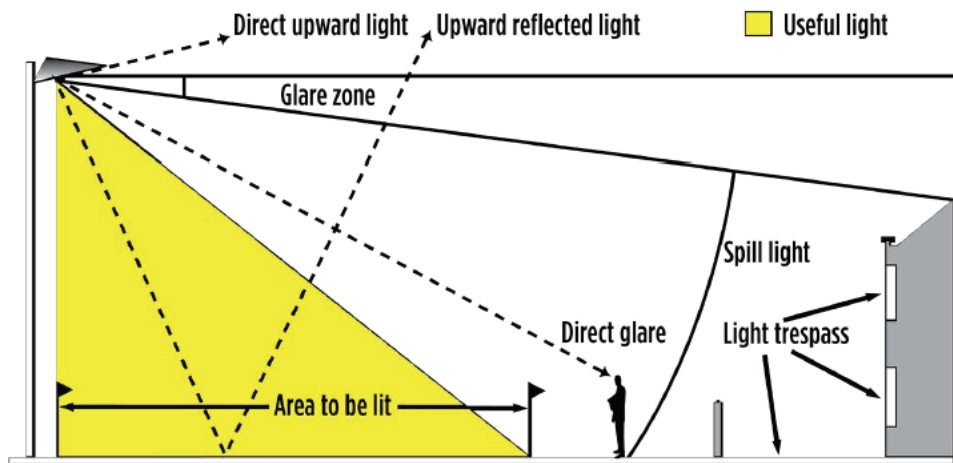
The Industry Standard for sports field lighting generally follows National Collegiate Athletic Association (NCAA) lighting standards for various sports and fields and their associated uses with varying levels of lighting depending on the level of competition expected.

Facility lighting has no formal best practices but is determined based on expected facility use and pedestrians and residents that may use a given facility. Facility lighting also takes into consideration security and the deterrence of crime, depending on the facility there can be significant differences in lighting.

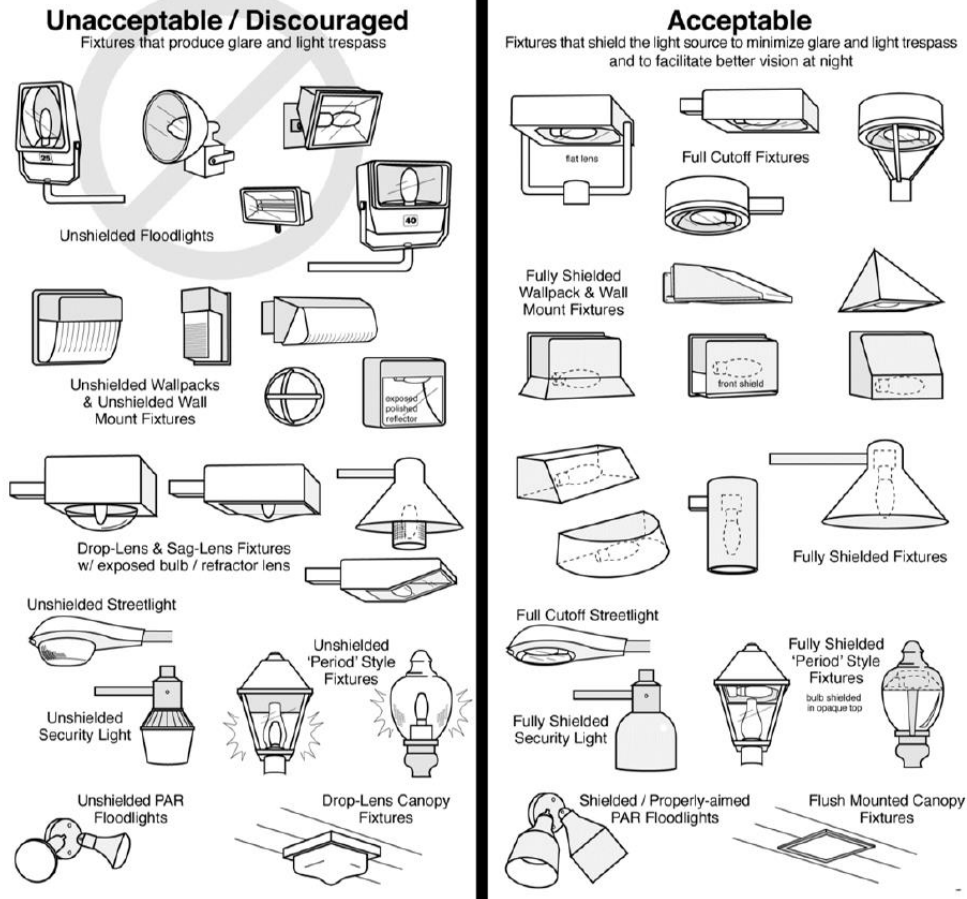
There is no standard in place governing the amount or type of lighting that can be used on private property, however the municipality does have a Municipal Right of Way By-law that does cover and speak to lighting that affects light trespass onto the municipal right of way.

What is light pollution and what is dark sky lighting?

Light pollution, is as the name suggests, the unintended nighttime light in the form of glare, light trespass, over lighting and sky glow which can reduce visibility for pedestrians and vehicles and have a negative impact on the health of humans, birds and the natural environment. Light pollution has also drastically limited our view of the stars in the night sky.



Dark Sky Lighting: These are light sources that do not broadcast light up into the atmosphere, but look to minimize lighting by using full cut off fixtures and applying only the required amount of lighting to a given area so as not to “over lit”. Examples of fixtures that provide dark sky compliant lighting can be found below:



It is important to have properly designed lighting as it is more efficient and effective, providing light exactly where it needs to be for safety and security and results in energy savings and reduced greenhouse gas emissions. Controlling light spillage can also result in darker environments for sleeping, less light at night that may attract migratory birds and less disturbance for fauna and natural areas. Effective lighting improves the quality of life for everyone.

As a municipality there are a number of lighting sources directly under municipal control; street lighting, facility lighting, and sports field and park lighting.

Street lighting makes up the bulk of the municipal light sources, and provides lighting for vehicle and pedestrian safety at night and in adverse weather conditions. Street lighting is installed primarily within urban or settlement areas, as previously noted all new street lighting is designed and installed based on the recommendations of RP-800 standards based on the Illuminating Engineering Society (IES) of North America which is industry best practice.

Sports field lighting, generally follows NCAA lighting standards for various sports and field uses with varying levels of lighting depending on the level of competition expected.

Building and facility lighting have no formal standards such as the Ontario Building Code, and relies on individual or organisational preference, there are regulations however in the Municipal Right of Way By-law that govern light trespass, such that if the lighting is affecting the use of the municipal right of way there are fines and enforcement activities that can be undertaken.

Safety and Security lighting is designed to protect people and property. The goal of security lighting is to discourage criminal activity by creating an environment where such activity may be readily and accurately observed. Poorly designed security lighting actually has the opposite effect: the glare of an unshielded lamp blinds an observer and affects dark adaptation, making it difficult to see into shadows. Security lighting is a major source of glare and over lighting.

There a number of municipal By-laws, standards, and documents that are in place related to lighting:

[Property Standards By-Law](#); this by-law provides information on the general state of repair of lighting equipment.

[Site Plan Manual](#); Provides general guidance on providing illumination for the safe movement of vehicles and pedestrians and direction to minimize glare and trespass lighting so as not to impact adjacent properties.

[Municipal Design Standards Manual](#): Provides standards and guidance for municipal street lights on the types of fixtures and the design standard to be used within Municipal right of ways.

[Municipal Right of Way By-Law](#): Provides for enforcement activities for light that may impact the use and safety of the municipal right of way.

Council Options:

Option 1 – Policy Creation

Should Council resolve a policy could be prepared that would be used as a municipal guide for decision making as it relates to lighting within the municipality, alternatively through preplanned document updates Staff can incorporate updates to the municipal design standards, and site plan manual to incorporate dark sky considerations to ensure new development going forward and any reconstructions look to minimize and make use of dark sky compliant or comparable fixtures.

Option 2 – Incorporate into New Development Practices and Operations

Outside of a policy, staff through infrastructure renewal and or construction will consider and make use of dark sky lighting where possible given security concerns are properly addressed.

As both a rural and urban community it is important to ensure that appropriate lighting is in place to for vulnerable road users and vehicles while looking to preserve the night sky, and natural environment.

Based on the above information and financial implications, staff are recommending that we incorporate best use practices to include new lighting technologies into new developments and operations thus avoiding the need for a new policy.

Financial Implications:

The use of Dark Sky compliant street lighting is not expected to have a significant impact on operating or planned capital budgets as these fixtures are currently of similar cost to fixtures that are not certified dark sky compliant. There are cost variations in street lights as there are numerous vendors and suppliers.

The continued and ongoing use of LED street lights will ensure the lowest operational costs as these lights are long lasting and significantly more energy efficient compared to older high pressure sodium (HPS) street lights

Any street lighting expansion or reconstruction is expected to cost approximately \$335,000 per kilometre and may vary depending on road classification and pedestrian volumes.

The continued administrative controls used for sports field and park lighting will continue to minimize lighting costs, as the lighting is only on as required to use the field for the sport.

Strategic Plan:

This matter aligns with following strategic priorities:

- Sustainable Infrastructure and Services
- Responsive Municipal Government

This report reviews the existing standards and documents providing information on municipal lighting, and the delivery of lighting in the municipality. The current service is delivered in a cost efficient and sustainable way.

Attachments:

N/A