

Roadway Lighting

PURPOSE OF ROADWAY LIGHTING



The purpose of roadway lighting is to improve traffic safety and operations during hours of darkness. Roadway lighting enhances visibility and helps drivers make safe choices.

Illuminance, or illumination, is defined as the amount of light on a surface at any point. Illumination is measured using the metric unit lux.

Some examples of typical lighting levels are:

- Full Summer Sun - 100,000 lux
- Hockey Arena - 1,000 lux
- General Office - 200 lux
- Residential Street - 2 lux
- Full Moonlight - 0.1 lux

HOW IS THE NEED FOR LIGHTING DETERMINED?

In assessing the need for lighting, the Ministry of Transportation (MTO) employs an analytical warrant model and a benefit cost analysis. The analytical warrant model considers the following factors that affect/reflect the visual needs of motorists:

- Roadway geometry - number of lanes, grades, curves, frequency of interchanges.
- Operational Factors - speed, volume of traffic and level of service .
- Collision history rates.
- Existing conditions - adjacent lighting.

LIGHTING TYPES

Lighting for highways is generally categorized into conventional lighting systems and high mast lighting systems.

Conventional Lighting System



- A conventional lighting system consists of steel poles ranging from 10 metres to 15 metres high. The poles support energy efficient, high pressure sodium luminaires. They are usually located in the centre median or along the edge of pavement.
- Conventional lighting systems provide good guidance for driver safety.
- Conventional lighting is economical where few installations are required.

High Mast Lighting System



- A high mast lighting system consists of steel poles ranging from 25 metres to 40 metres high. These poles support high pressure sodium luminaries. They are usually located in the centre median or within the interchange areas.
- High mast lighting systems produce a comfortable light with minimal glare for drivers.
- High mast poles are located safely away from vehicle traffic.
- High mast lighting is economical where many installations are required.



A number of factors are considered when determining the most suitable type of illumination, including MTO's equipment standards, adjacent lighting installations, quality of lighting provided by various installations, impact of a particular type of installation on the surroundings, capital costs, and life cycle costs.

Typically, for new freeways, the high mast lighting system is used.

BENEFITS OF ROADWAY LIGHTING

Research indicates that roadway lighting results in a 30 per cent reduction in nighttime collisions. Other less quantifiable benefits include reduced travel time/delay, reduced fuel consumption, reduced pollution, better guidance, and less driver errors.

MITIGATION

Through proven engineering practices, MTO can usually limit the amount of unwanted light spillage from luminaires onto private property. High mast lighting systems, where necessary, can be equipped with shields to control the direction and amount of downward light that would otherwise reach beyond the MTO right-of-way.



Non Shielded Luminaire



Shielded Luminaire

FOR FURTHER INFORMATION CONTACT

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