



## SEAD Procurement

# Street Lighting

Street lighting is typically one of the largest sources of energy consumption under a municipality's direct control. Public street and area lighting account for up to 40% of electricity consumed by municipalities, and for about 1-3% of total electricity demand (The Climate Group, 2012).

Street lights are important for visibility and safety, and energy efficient street lights can help municipalities and utilities save energy and money. Lighting design, the light source, and standards are important considerations for a municipality transitioning to more efficient and effective street lights.

### Lighting Design

Well-designed street lighting takes into account roadway geometry, target light levels, and the performance characteristics of the luminaires. **Roadway Geometry** describes the size and shape of the road that will be lit, as well as the placement and height of poles, and the length of the mounting arms. **Target Light Levels**, such as luminance or illuminance measures and uniformity ratio, are specified by accepted standards, including IESNA's RP-8, CIE's 115, or country specific standards. **Luminaire Performance Characteristics**, including efficacy, light output and distribution, lamp lumen depreciation, and luminaire dirt depreciation, determine how efficiently the luminaire delivers light to where it is needed. Although street lights' operating hours directly influence their energy consumption, well-designed street lighting can reduce energy consumption by taking all of these factors into account, and employ the most energy efficient design to meet all of the requirements.

### Lighting Sources

The three main street lighting sources in use—High Pressure Sodium (HPS), Metal Halide (MH), and Light Emitting Diode (LED)—can produce similar light output



per watt of power consumption. However, well-designed LED luminaires can offer the best control over light direction and uniformity, and as such provide opportunities to improve energy efficiency and deliver energy savings. Energy consumption can be reduced by selecting the most appropriate and energy efficient luminaire for the particular roadway—regardless of which light source is used.

### Lighting Standards

Several lighting standards provide guidance on appropriate lighting levels for various road types. The two most prominent standards cited are the Illuminating Engineering Society of North America's National Standard Practice for Roadway Lighting (IESNA RP-8) and the International Commission on Illumination Technical Report—Lighting of Roads for Motor and Pedestrian Traffic (CIE 115). Among other criteria, both RP-8 and CIE 115 provide recommended minimum average light levels and uniformity ratios.

### SEAD Street Lighting Tool

The SEAD Street Lighting Tool provides a quick, easy way for municipalities to lower their energy consumption and reduce life cycle costs of potential fixture upgrades while ensuring light quality in the transition to more energy efficient street lights.



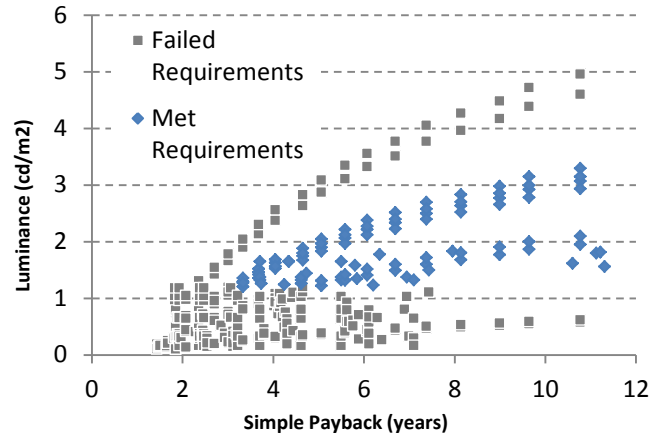
# Street Lighting Evaluation Tool

## Tool Features

- Calculate simple payback for upgrade fixtures and estimate energy savings
- Verify manufacturer performance claims
- Analyze multiple fixtures simultaneously to determine if fixtures meet lighting targets for a specified roadway
- Develop a short list of candidate fixtures for a specific upgrade
- Available in English, French, and Spanish

## SEAD Tool in Use

- The Swedish Energy Agency has piloted the Tool in three municipalities.
- Natural Resources Canada and LightSavers Canada are initiating pilot projects in two Canadian municipalities.
- India’s Bureau of Energy Efficiency plans to use the tool in LED pilot projects in ten municipalities and incorporate the tool in its national street lighting Code of Practice.
- Mexico’s National Commission for Energy Efficiency is reviewing the tool for use in a national public lighting project to replace all inefficient street lamps.



*A Canadian municipality used the tool to identify fixtures that met lighting performance criteria – these were up to 74% more efficient than the existing fixture.*

## More Information

The SEAD Street Lighting Tool is free and available for download at [www.superefficient.org/SLtool](http://www.superefficient.org/SLtool). The data requirements for the SEAD Street Lighting Tool are available at [www.superefficient.org/sltooldata](http://www.superefficient.org/sltooldata). To learn more about participating in a SEAD Tool Demonstration Project please visit [www.superefficient.org/sltooldemo](http://www.superefficient.org/sltooldemo).

For questions or to participate in a SEAD Tool Evaluation Demonstration Partnership, please email [sltoolkit@superefficient.org](mailto:sltoolkit@superefficient.org).

| Comparison between SEAD Street Lighting Tool and Conventional Lighting Design Software | SEAD Tool | Conventional Software (AGI32, Dialux, etc) |
|--|-----------|--|
| Analysis of a large number of simultaneous fixtures                                    | Yes       | No   |
| Combine financial analysis with light performance                                      | Yes       | No   |
| Perform early analysis of simple or generic road segments                              | Yes       | Yes  |
| Analyze complex road geometries  | No        | Yes  |
| Verify compliance with RP-8 for specific road segments                                 | No        | Yes  |

*The Super-efficient Equipment and Appliance Deployment (SEAD) Initiative of the Clean Energy Ministerial (CEM) and the International Partnership for Energy Efficiency Cooperation (IPEEC) helps turn knowledge into action to accelerate the transition to a clean energy future through effective appliance and equipment energy efficiency programs. SEAD is a multilateral, voluntary effort among Australia, Brazil, Canada, the European Commission, France, Germany, India, Japan, South Korea, Mexico, Russia, South Africa, Sweden, the United Arab Emirates, the United Kingdom, and the United States.*