



STREET LIGHTING

Street lighting generally takes the form of either lighting over the roadway (roadway lighting) or over the sidewalk or trail (pedestrian lighting) – although some lighting serves both purposes. Pedestrian lighting is generally lower (12 to 18 feet above sidewalk level) with closer spacing while roadway lighting is higher (22 feet or more) with greater spacing distance. Lighting improves both safety and the sense of security. Lighting should be carefully designed to avoid light pollution (unnecessary lighting), intrusive light (light cast into private residences and adjacent buildings), and unattractive color rendition (e.g. yellow color of sodium vapor lights).

The operating cost of electricity for street lighting can be a major expense for cities, therefore many cities are seeking adoption of more energy efficient lighting strategies such as LED lighting and/or street lights powered by renewable energy.

USE


- Street lighting must illuminate the roadway/travel way and Pedestrian Zone, as well as crosswalks and other conflict points.
- Street lighting is desirable on all street types and is a priority in the Urban Center and Neighborhood Business districts as well as other critical travel corridors such as Network Residential and Crosstown Connector. Alleys may or may not have street lighting.

- Pedestrian-oriented street lighting may be difficult in areas with above ground electrical and communication utilities. Undergrounding of utilities should be strongly encouraged and/or mandated – especially with street or Pedestrian Zone reconstruction projects.

DESIGN

- Street lighting should provide consistent lighting levels and avoid high contrasts of light and dark areas. In some cases, low lighting is preferable over bright lighting to avoid areas of intense shadow.
- Street light spacing should prioritize the provision of even illumination. However, the spacing of street lights can also contribute to a clear sense of the street edge and traffic calming (as vehicle speeds are often influenced by the spacing distance of vertical street elements).
- Light poles are generally set back two feet from the face of curb in a straight line along the street edge. Additionally, lighting may be provided on bump outs.
- Pedestrian level lighting is generally sufficient to illuminate both the Pedestrian Zone and Travel Zone in the typical Grand Rapids street (55 to 65 foot wide right-of-way). Wider streets may require unique fixtures for Pedestrian Zone and Travel Zone lighting.
- Pedestrian Zone lighting is generally spaced 20 to 40 feet apart (measured from the center of the pole). Travel Zone lighting may be spaced 60 to 120 feet apart depending on the lighting element.

- It is typical to alternate street lights in the Pedestrian Zone with street trees (combined spacing of 10 to 20 feet apart).
- Effective, high efficiency lighting such as LED light fixtures are strongly encouraged as a means to reduce energy costs.
- Full cut off or shielded lighting should be used to support “Dark Skies” objectives.

 Street lighting spacing and design should facilitate and accommodate robust growth of street trees and installation of green infrastructure features.

SPECIAL CONSIDERATIONS

- Higher levels of lighting may be desired at transit stops, bike share stations, or other areas of concentrated pedestrian activity. Pedestrian scaled lighting may be used in areas where pedestrian demand is high or in special districts or areas that are intended to have a special character or sense of place.
- Light poles may be arranged in an “alternate” or “opposite” configuration. Opposite configurations are typically associated with more formal, higher order streetscapes.
- Brackets for banners, hanging baskets, or other ornamentation may be affixed or integrated into the light pole as long as they do not obstruct pedestrian travel and are approved by the city.

- Street signage, bicycle parking, and/or single space parking meters may be integrated into light poles to reduce sidewalk clutter. Light poles may also accommodate micro-cells.

OPERATIONS AND MAINTENANCE

- LED lighting elements will reduce electric utility costs for street lighting.
- Lighting fixtures should generally be limited to a small number of approved standards. This contributes to a cohesive public realm and more cost-effective maintenance. Unique street light fixtures may be approved with a confirmed maintenance agreement.

REFERENCES

- AASHTO: Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2004
 - Section 3.2.11: Pedestrian Facility Lighting
- AASHTO: A Policy on Geometric Design of Highways and Streets (Green Book), 2011
 - Section 5.3.8: Roadway Lighting
- Illuminating Engineering Society. Road Lighting Guide. <http://www.ies.org/store/product/road-lighting-1363.cfm>
- Illuminating Engineering Society. Design Guide for Residential Street Lighting (DG-21-15) <http://www.ies.org/store/product/design-guide-for-residential-street-lighting-dg2115-6373.cfm>

