

Texas Department of Transportation

Technical Provisions

Book 2

Attachment 16-2

Illumination Levels

Section 2

Illumination Levels

Introduction

This section describes TxDOT's standards for illumination levels for various roadway lighting situations.

References. See "References" in Chapter 1, Section 1, for information on acquiring the publications discussed in this section.

Continuous Lighting

The design method for continuous lighting of typical roadways should be the "illuminance" method. The light level for all applications should be as required by AASHTO's design guide: *Informational Guide for Roadway Lighting*. The "luminance" method requirements may be added or used in lieu of the "illuminance" requirements when deemed appropriate by the design engineer. The "luminance" method is preferred for tunnel lighting. Small target visibility (STV) should not be used.

TxDOT does not normally light frontage roads. Ramps and direct connectors should be lit to the same level as main lanes.

Safety Lighting

Safety lighting or "spot" lighting need not meet the light level requirements of continuous lighting; however, careful consideration should be given to the avoidance of excessive glare. Elements to consider include mounting heights, lamp wattage, and photometric distribution. The use of fixtures and mounting heights recommended in this manual and shown on the Roadway Illumination Details, as normally applied, will not create excessive glare. See Chapter 5, Section 3, for details on fixture requirements.

Tunnels

Tunnel lighting should be designed for asymmetric or pro-beam lighting systems only, except that tunnel transition zones may be counter-beam. Tunnel lighting should be designed in accordance with the above referenced AASHTO design guide or may be designed in accordance with the more comprehensive guidelines of CIE or IESNA.

Sidewalks and Bikeways

When installing lighting using state funds on sidewalks and bikeways (henceforth termed pedestrian lighting) along streets and highways, it is essential that the street be lit to the same level as the sidewalk or bikeway. This road lighting may be existing or may be added with the pedestrian lighting; it may be a part of the same lighting system or a separate lighting system.

This requirement is not intended to oblige cities or other entities to light the entire roadway if they desire some type of lighting along the roadway in accordance with Chapter 2, Section 5. However, the following points are generally accepted and should be considered:

- ◆ The reduction of veiling glare is beneficial.
- ◆ Veiling glare observed by a motorist is mitigated by increasing the illuminance of the roadway.
- ◆ Since lighting warrant CL-3 is used to establish that the expenditure of state funds for the mitigation of off-roadway lighting (veiling glare) would be sufficiently beneficial, TxDOT should not consider it reasonable to use state funds to build the very thing that needs mitigation.

The street and sidewalk or bikeway may be considered together as one element in determining minimum light level and uniformity. The contribution of both the pedestrian lighting system and the road lighting system may be considered for calculating light levels and uniformity of the sidewalk or bikeway and the roadway.

Other Types of Lighting

Other types of lighting systems (such as for rest areas, parking lots, central business districts, or temporary lighting in work zones) may be designed to meet the applicable requirements of AASHTO, IESNA, CIE, or other standards as deemed appropriate by the district engineer.

Additional Information

Additional information on light trespass may be found in CIE and IESNA publications. This information should be considered guidelines and not mandatory requirements.