11-4-1 Design Applications – Roadway Lighting April 2024

POLICY

Unless described otherwise, all roadway lighting designed for the State Trunk highway systems that is owned and maintained by WisDOT **shall** follow the design application guidelines described in this section.

All luminaires on state-maintained highway systems **shall** be LED and selected from the WisDOT's Qualified Electrical Products List (QPL) except in special cases.

REFERENCE TO STANDARDS

The design of highway roadway lighting **shall** conform to applicable provisions of Chapter 11, Section 50 of the WisDOT Facilities Development Manual (FDM), except as modified herein. In addition, the highway roadway lighting design **shall** comply with the requirements of the latest edition of the following:

- WisDOT Standard Specifications
- WisDOT Standard Detail Drawings
- WisDOT Standard Bid Items
- Wisconsin Bicycle Facility Design Manual
- Wisconsin Guide to Pedestrian Best Practices
- ANSI / IES Roadway Lighting RP-8-22 (Lighting Roadway and Parking Facilities)
- AASHTO Roadway Lighting Design Guide
- AASHTO Guide for Park and Ride Facilities
- National Electrical Code
- Wisconsin Electrical Code
- Local codes and ordinances

11-4-2 Roadway Lighting – Signalized Intersections April 2024

APPLICATION

This policy and the related information apply to all WisDOT maintained signalized intersections, including single point interchanges (SPI), double diverging diamond interchanges (DDI), and other non-standard signalized intersections and interchanges on the State Trunk highway systems.

POLICY

All WisDOT maintained signalized intersections **shall** include roadway lighting in accordance with this document.

Power for the roadway lighting of WisDOT maintained signalized intersections *should* be fed from circuits from the signal cabinet. If the total amperage and/or number of circuits of the proposed intersection roadway lighting exceeds the capacity of the traffic signal cabinet, installing a separate roadway lighting cabinet **shall** be evaluated.

When slotted left turn lanes and other complex signalized approach geometry are illuminated, these *should* be considered part of the intersection and be fed from the signal cabinet, subject to coordination with WisDOT or locally maintained continuous roadway lighting where applicable.

DESIGN CONSIDERATIONS

Several factors can affect the design of roadway lighting for signalized intersections. The required illumination level and the constraints of pole locations are the most important factors and are sometimes incompatible. he designer is responsible for balancing all the design considerations and applying engineering judgment to produce a safely illuminated, fully operational, and constructable system.

The decision to signalize an intersection is based on the results of a signal investigation study of safety and operational factors. These factors typically relate to important visual tasks, and to conflicts with other vehicles and pedestrians. These are important when considering roadway lighting and are discussed in IES RP-8-22 and AASHTO Roadway Lighting Design Guide, which is a reference for this document.

Often signalized intersections are in urban areas along continuously illuminated streets. Intersections of roadways with continuous roadway lighting are considered full intersections. The IES recommended illuminance levels for full intersections of continuously illuminated urban streets are the sum of the recommended values for the intersecting roadways. Intersections of roadways without continuous roadway lighting are considered partial (isolated) intersections and follow a separate set of criteria as defined by IES RP-8-22 and AASHTO Roadway Lighting Design Guide. Table 1 below, based on roadway and pedestrian classifications, summarizes these values for full intersection lighting of continuously illuminated roadways. Table 2 summarizes these values for partial (isolated) intersection lighting.

Note: AASHTO refers to the pedestrian area classifications as commercial, intermediate, and residential land uses (Versus “High / Medium / Low” Pedestrian Activity, respectively).

Table 1. Pavement Illuminance Criteria for Full Intersection Lighting (Lux/Fc)

	Pedestrian Activity Level Classification			
Functional Classification	**High**	**Medium**	**Low**	E_{avg}/E_{min}
Major/Major	34/3.2	26/2.4	18/1.7	3:1
Major/Collector	29/2.7	22/2.0	15/1.4	3:1
Major/Local	26/2.4	20/1.9	13/1.2	3:1
Collector/Collector	24/2.2	18/1.7	12/1.1	4:1
Collector/Local	21/2.0	16/1.5	10/0.9	4:1
Local/Local	18/1.7	17/1.3	8/0.7	6:1

Table 2. Pavement Illuminance Criteria for Partial (Isolated) Intersection Lighting

	Pavement Classification			Uniformity Ratio
Road Classification	**R1 lux/fc**	**R2 & R3 lux/fc**	**R4 lux/fc**	E_{avg}/E_{min}
Major	6/0.6	9/0.8	8/0.7	3.0
Collector	4/0.4	6/0.6	5/0.5	4.0
Local	3/0.3	4/0.4	4/0.4	6.0

CALCULATION BOUNDARIES

Engineering judgement **shall** be used when designating calculation boundaries for intersections. In general, calculation boundaries *should* be drawn to include the footprint of all intersecting movements, bicycle and pedestrian crossings, and areas with merging/diverging/conflicting movements. The calculation boundary shown in the figures below are the areas to which the intersection illumination levels apply. This boundary area includes at a minimum the area bound by the far side of the pedestrian crosswalks on all approaching roadways. If a pedestrian crosswalk is not present, the calculation area **shall** be the area enclosed by the intersection stop bars extending across the departure lanes. In the absence of both pedestrian crosswalks and stop bars, the calculation area **shall** be the area enclosed by the connection of the radius return of each intersection leg, like that identified in the figures below.

Figure 1. Signalized Intersection Illumination Calculation Boundary

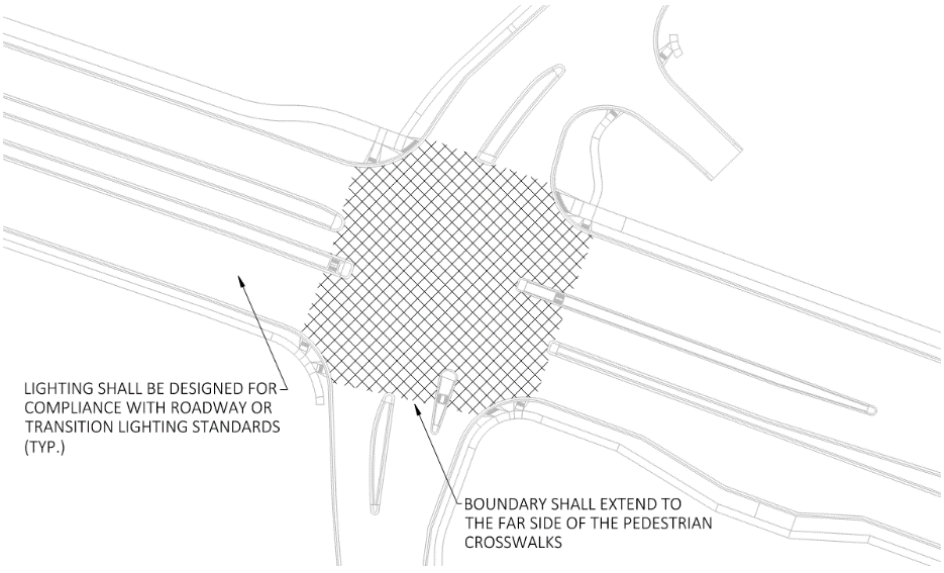


Figure 2. Single Point Urban Interchange (SPUI) Illumination Calculation Boundary

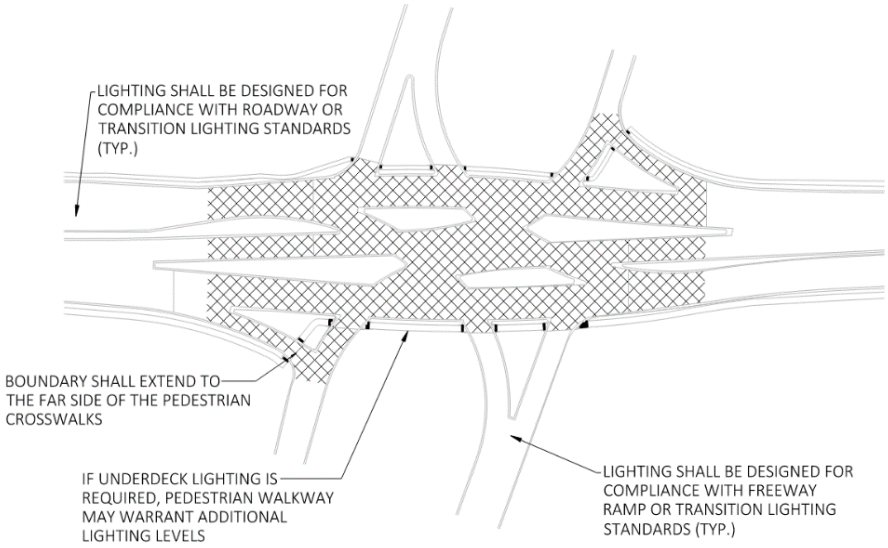
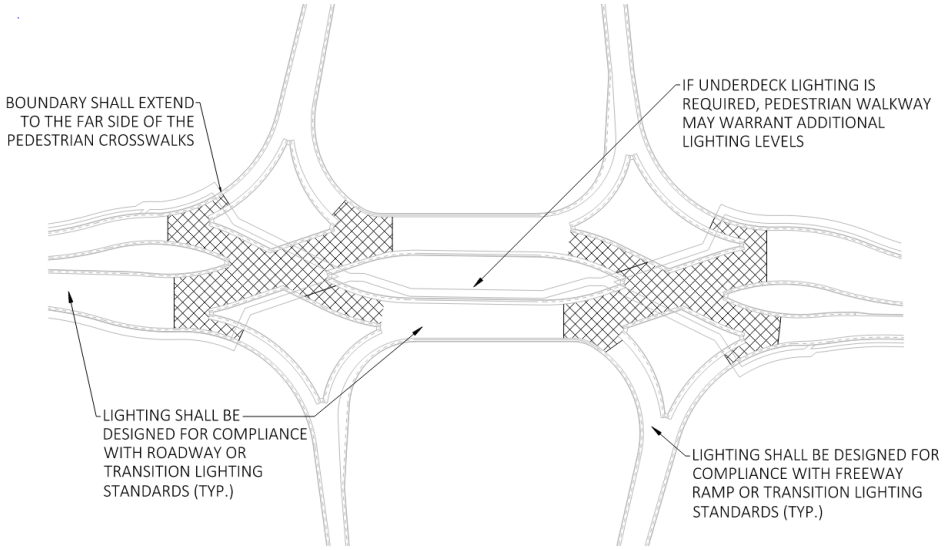


Figure 3. Diverging Diamond Interchange (DDI) Illumination Calculation Boundary



LIGHTING LAYOUT

WisDOT's best practices have illustrated the importance of minimizing poles within the intersection boundary. For this reason, the lighting designer **shall** install luminaires on traffic signal poles whenever possible. The designer **shall not** begin the roadway lighting layout before obtaining the signal plan.

Particularly for large or otherwise complex intersections, it *may* be difficult to achieve the illumination and uniformity levels recommended without additional poles beyond those required for the signals. Use engineering judgment to add stand-alone poles when supplemental illumination is a priority. In such cases, the designer **shall** consider and prioritize the following design considerations:

- Poles **shall** be combined whenever possible to reduce the number of objects near the roadway.
- Poles *should* meet the design criteria as presented in TEOpS 11-3.
- Prioritize illuminating the far side of the intersection to help clearly identify fixed elements in the path of the vehicle, whether turning or continuing straight.
- Pedestrians in crosswalks are dark objects and difficult to see, particularly when the vehicle is making a right turn. Illuminating crosswalks is a high priority, providing positive contrast whenever possible.
- Horizontal lighting levels *should* be considered for pedestrian crosswalks and movements, especially on roadways with high speeds or high pedestrian activity.

- Designers **shall** avoid placing light poles where prone to over tracking of freight movements and potential off tracking by errant vehicles and in slippery conditions.
- Designers *should* evaluate access management, sight distance, transitions to adjacent intersections, and other pertinent factors when determining whether to include roadway lighting for approaches to signalized intersections. This is especially true in high-speed environments.
- For large intersections it *may* be difficult to achieve uniformity due to large offsets to light poles. Non-standard uniformity results *may* be justified by excluding small and hard to reach areas near the middle of large intersections.
- For divided roadways, designers *should* consider using both twin luminaires located in medians and channelizing islands instead of using single luminaires on the roadside to determine the optimum design.
- Where illumination of slotted left turn lanes is included, the poles *should* be located in the raised median on the driver's side.

DESIGN PROCEDURAL REQUIREMENTS

The designer **shall** contact the Regional Lighting Engineer to verify roadway and pedestrian/land use classifications prior to beginning the design for signalized intersection illumination.

A Signalized Intersection Illumination Form is included to assist in identifying the appropriate roadway and pedestrian/land use classifications and subsequent light levels.

The designer *should* prepare intersection illumination calculations using AGI32 software and the calculation boundaries described in this document.

SIGNALIZED INTERSECTION ILLUMINATION FORM

(To be completed prior to design)

GENERAL INFORMATION:
Location: _____
Street 1: _____ ADT: _____
Street 2: _____ ADT: _____
Pedestrian Count (1Hr): _____

ROADWAY AND AREA CLASSIFICATION:
Street 1: _____
Street 2: _____

DETERMINATION OF ILLUMINATION VALUES:
Use values from Illuminance Levels for Intersections Table in 11-4-2
Illuminance Value: _____ **Avg/Min Value**: _____

11-4-3 Roadway Lighting – Roundabouts April 2024

APPLICATION

This policy and the related information apply to all WisDOT maintained roundabouts on the State Trunk highway systems.

POLICY

All WisDOT maintained roundabouts **shall** include roadway lighting in accordance with this document.

Any local requests for special roadway light poles or fixtures will be reviewed by the Department. If allowed, the roadway lighting **shall** be operated and maintained by the local government through the Standard Lighting Permit Process.

DESIGN CONSIDERATIONS

The roundabout intersection illumination area **shall** be calculated by using the illuminance method.

TEOpS 11-3-1 explains roadway and pedestrian area classifications used to determine the recommended illuminance levels outlined below in Table 1. Note: AASHTO refers to the pedestrian area classifications as commercial, intermediate, and residential land uses (Versus “High / Medium / Low” Pedestrian Activity).

The recommended illuminance levels at roundabouts are, essentially, the sum of the recommended values for continuously illuminated approaching roadways.

Table 1. Illuminance Levels for Roundabouts (Lux/Fc)

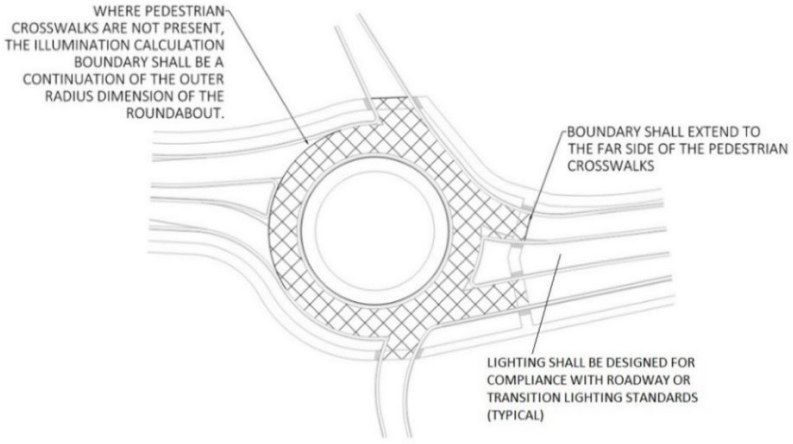
Functional Classification	Pedestrian Activity Level Classification			E_{avg}/E_{min}
	High	Medium	Low	
Major/Major	34/3.2	26/2.4	18/1.7	3:1
Major/Collector	29/2.7	22/2.0	15/1.4	3:1
Major/Local	26/2.4	20/1.9	13/1.2	3:1
Collector/Collector	24/2.2	18/1.7	12/1.1	4:1
Collector/Local	21/2.0	16/1.5	10/0.9	4:1
Local/Local	18/1.7	17/1.3	8/0.7	6:1

For roundabouts along low-volume roadways with low pedestrian activity that are not continuously illuminated, the values for Local/Local *should* be used. Special consideration *should* be given to roundabouts in rural areas and in areas where roadway lighting was not present prior to an intersection improvement project. Coordination with local officials and property owners *may* be required to address concerns with light trespass and glare.

CALCULATION BOUNDARIES

Engineering judgement **shall** be used when designating calculation boundaries for roundabouts. The calculation boundary is the area to which the illumination levels in Table 1 apply. This boundary *should* include the traffic conflict area extending to the far side of the pedestrian path on each of the approaching roadways. If a pedestrian path is not present, the calculation area extends to the outside radius of the roundabout entrance and exit including the entire traffic conflict area. Refer to the figure below for a visual depiction. When bypass lanes are used, they *should* be included within the calculation boundary.

Figure 1. Roundabout Illumination Calculation Boundary



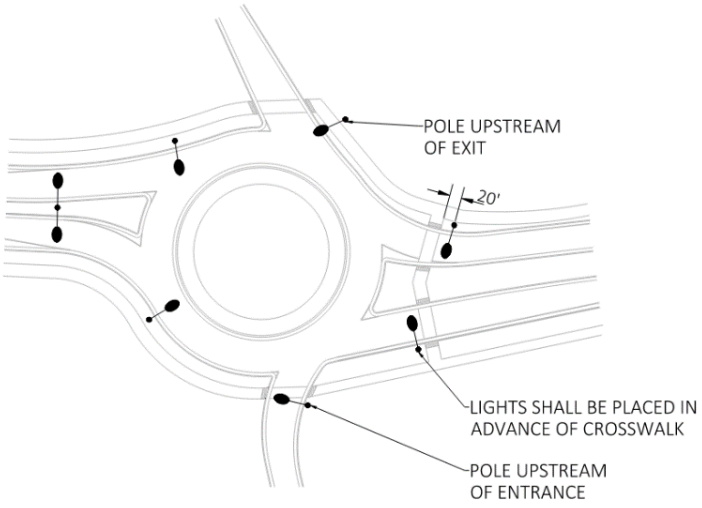
ROADWAY LIGHTING LAYOUT

The designer **shall** consider and prioritize the following design considerations:

- Poles **shall** meet the design criteria as presented in TEOpS 11-3.
- Minimize the impedance of roundabout approach signage sight lines.
- Place roadway light poles on the right-hand perimeter just upstream of entrance and exit points.
- Pedestrians in crosswalks are dark objects and difficult to see, particularly when the vehicle is making a right turn. Illuminating crosswalks is a high priority, providing positive contrast whenever possible.
- Horizontal lighting levels *should* be considered for pedestrian crosswalks and movements, especially on roadways with high pedestrian activity.
- Designers **shall** avoid placing light poles where prone to over tracking of freight movements and potential off tracking by errant vehicles and in slippery conditions.
- For large multi-lane roundabouts, it *may* be difficult to achieve uniformity due to large offsets to light poles. Non-standard uniformity results *may* be justified by excluding small and hard to reach areas near the middle of large roundabouts.

For divided roadways, to determine the optimum design, designers *should* consider using both twin luminaire poles located in medians and bypass islands instead of using single luminaire poles on the roadside.

Figure 2. Roundabout Typical Lighting Layout



DESIGN PROCEDURAL REQUIREMENTS

The designer **shall** contact the Regional Lighting Engineer to verify the classifications for the roadway and pedestrian/land use prior to beginning the roadway lighting design.

The designer *should* prepare illumination calculations using AGI32 software using the calculation boundaries described in this document.

A Roundabout Illumination Form is included to aid in identifying the appropriate roadway and pedestrian classifications and subsequent light levels. The designer **shall** complete this form and submit it to the Regional Lighting Engineer for approval prior to beginning the lighting design for a roundabout on the state highway system.

ROUNDABOUT ILLUMINATION FORM

(To be completed prior to design)

GENERAL INFORMATION:
Location: _____
Street 1: _____ ADT: _____
Street 2: _____ ADT: _____
Pedestrian Count (1Hr): _____

ROADWAY AND AREA CLASSIFICATION:
Street 1: _____
Street 2: _____

DETERMINATION OF ILLUMINATION VALUES:
Use values from Recommended Illuminance Levels at Roundabouts, Table 1 in 11-4-1
Illuminance Value: _____ **E**avg/**E**min **Value**: _____

11-4-4 Roadway Lighting – Restricted Crossing U-Turn (RCUT) April 2024

APPLICATION

This policy and the related information apply to all WisDOT-maintained RCUTs on the State Trunk highway and US highway systems.

POLICY

All WisDOT-maintained RCUTs **shall** include roadway lighting in accordance with this document.

DESIGN CONSIDERATIONS

The FHWA provides the following guidance on roadway lighting for RCUT intersections:

Roadway lighting standards and specifications outlined in AASHTO's Street Lighting Design Guide, FHWA's Lighting Handbook, and the Illuminating Engineering Society (IES) publications including American National Standard Practice for Street Lighting can be used to determine optimal roadway lighting for RCUT intersections.

Based on national roadway lighting guidance, agencies establish street lighting design guidelines along their facilities based on the road functional classification and pedestrian conflict area classifications. Intersection lighting is typically 1.5 times the street lighting levels along the approaches, or the street lighting levels of the two crossing streets are added together to determine the roadway lighting guidelines for the intersection.

Generally, signalized RCUT intersections are constructed on streets with high traffic volumes likely meeting the corridor volume criteria for roadway lighting. It is desirable to light the main and crossover intersections according to the determined intersection light levels. Depending on the intersection spacing, the light levels for the road segments between the intersections may *be reduced to street segment light levels. If there is no roadway lighting along the approaches, then transition lighting coming from dark into light and vice versa* may *enhance user experience and performance. Even with sufficient roadway lighting provided for the overall intersection, additional supplemental roadway lighting could be added in the median to illuminate the pedestrian refuge area.*

Roadway lighting at a stop- or merged-controlled RCUT intersection will follow similar roadway lighting criteria as conventional intersections. These types of RCUT intersections are more likely to be located on a street without continuous roadway lighting.

The RCUT intersection area **shall** be calculated by using the illumination method.

TEOpS 11-3-1 explains roadway and pedestrian area classifications used to determine the recommended illuminance levels outlined in TEOpS 11-4-2 Table 2 for Isolated Intersections. Note: AASHTO refers to the pedestrian area classifications as commercial, intermediate, and residential land uses (Versus “High / Medium / Low” Pedestrian Activity).

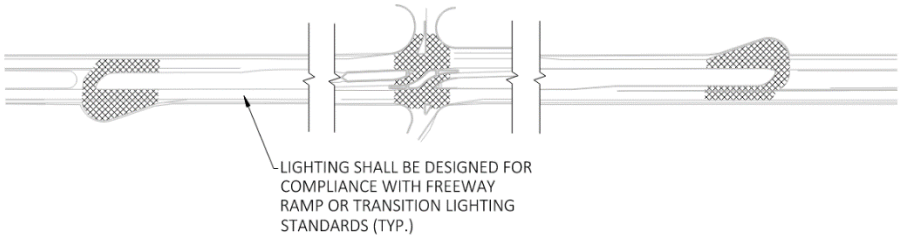
For RCUTs along roadways without pedestrian accommodations and that are not continuously illuminated, the partial (isolated) intersection illumination values for Local *should* be used.

For values along roadways that are continuously illuminated, the values *should* represent the roadway of each direction of travel where the RCUT is installed.

CALCULATION BOUNDARIES

The calculation boundary is the area to which the illumination levels in Table 2 apply. Calculation boundaries for RCUTs *should* be based on the unique characteristics of each location and confirmed with the Regional Lighting Engineer. Refer to the figure below.

Figure 1. RCUT Illumination Calculation Boundary



ROADWAY LIGHTING LAYOUT

Light poles **shall** be located according to these considerations:

- Poles **shall** meet the design criteria as presented in TEOpS 11-3.
- Pole placement **shall** ensure illumination of conflict areas and merge points.
- Minimize the impedance of approach signage sight lines.
- Use engineering judgment to determine appropriate light pole locations to ensure that decision points are illuminated.
- Coordinate all clear zone and roadside sloping issues.

DESIGN PROCEDURAL REQUIREMENTS

The designer **shall** contact the Regional Lighting Engineer to verify the classifications for the roadway and pedestrian/land use prior to beginning the roadway lighting design.

The designer *should* prepare illumination calculations using AGi32 software using the calculation boundaries described in this document.

11-4-5 Roadway Lighting – Freeways and Metered Ramps April 2024

APPLICATION

This policy and the related information apply to all WisDOT maintained metered ramps, and any freeways and expressways approved by WisDOT for continuous or partial roadway lighting installations on the State Trunk highway, US highway, and Interstate highway systems. The guidance in this section applies to segments of freeway and ramps that have been approved for installation of roadway lighting in accordance with TEOpS 11-1-1.

POLICY

All WisDOT maintained metered ramps and approved freeways or expressways **shall** include roadway lighting in accordance with this document.

DESIGN CONSIDERATIONS

Straight segments of freeways and metered ramps **shall** be calculated using the luminance method, while curved segments **shall** be calculated using the illuminance method. TEOpS 11-3-1 explains roadway classifications used to determine the recommended luminance levels outlined below in Table 1.

Table 1. Lighting Design Criteria for Highways

Highway Classification	Average Luminance L_{avg} (cd/m^2)	Average Uniformity Ratio L_{avg}/L_{min}	Maximum Uniformity Ratio L_{max}/L_{min}	Maximum Veiling Luminance Ratio $L_{v,max}/L_{avg}$
Freeway Class A	0.6	3.5	6.0	0.3
Freeway Class B	0.4	3.5	6.0	0.3
Expressway	1.0	3.0	5.0	0.3

Partial interchange roadway lighting *may* be installed on freeways and highways when continuous roadway lighting is not warranted (per AASHTO warranting conditions). Partial roadway lighting consists of a roadway lighting system that is put in place to provide illumination at points of potential conflict. It is not considered continuous, but some of the rules that apply to continuous roadway lighting will apply in the design of partial roadway lighting, such as pole placement and calculation procedures. Recommended illuminance levels for partial interchange roadway lighting are outlined below in Table 2.

Table 2. Illuminance Criteria for Partial Interchange Roadway lighting

Highway Classification	R1 Lux (fc)	R2, R3 Lux (fc)	R4 Lux (fc)	Uniformity Ratio E_{avg}/E_{min}
Freeway Class A	6.0 (0.6)	9.0 (0.8)	8.0 (0.7)	3.0
Freeway Class B	4.0 (0.4)	6.0 (0.6)	5.0 (0.5)	3.0
Expressway	6.0 (0.6)	9.0 (0.8)	8.0 (0.7)	3.0

For metered ramps along roadways that are not continuously illuminated, transition lighting *should* be considered.

CALCULATION BOUNDARIES

The calculation boundary is the area to which the illumination levels in Table 2 apply. Illuminance calculation zones **shall** be created for reference to the following figures.

Figure 1. Entrance Ramp Illumination Calculation Boundary

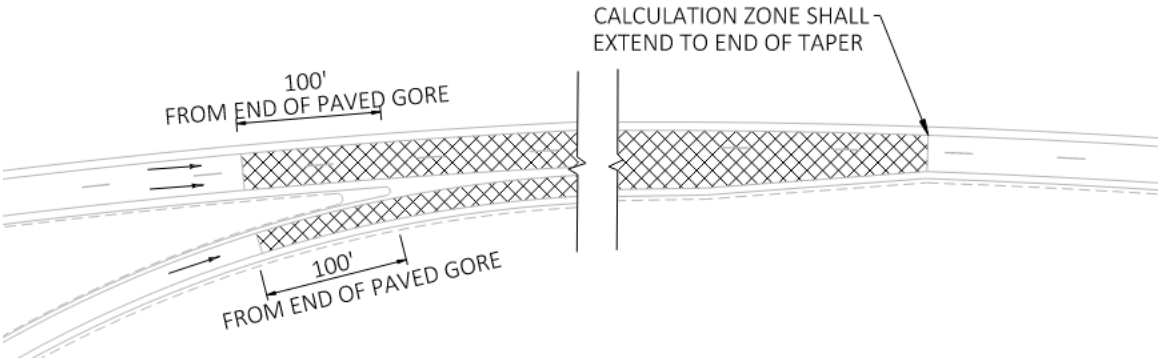


Figure 2. Exit Ramp Illumination Calculation Boundary

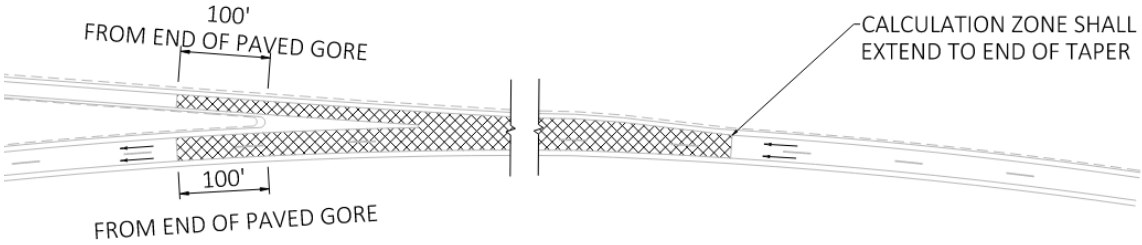
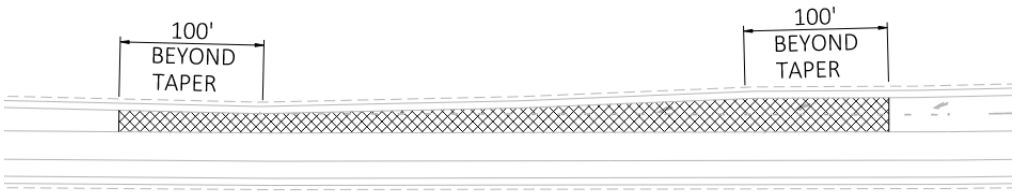


Figure 3. Lane Reduction Illumination Calculation Boundary



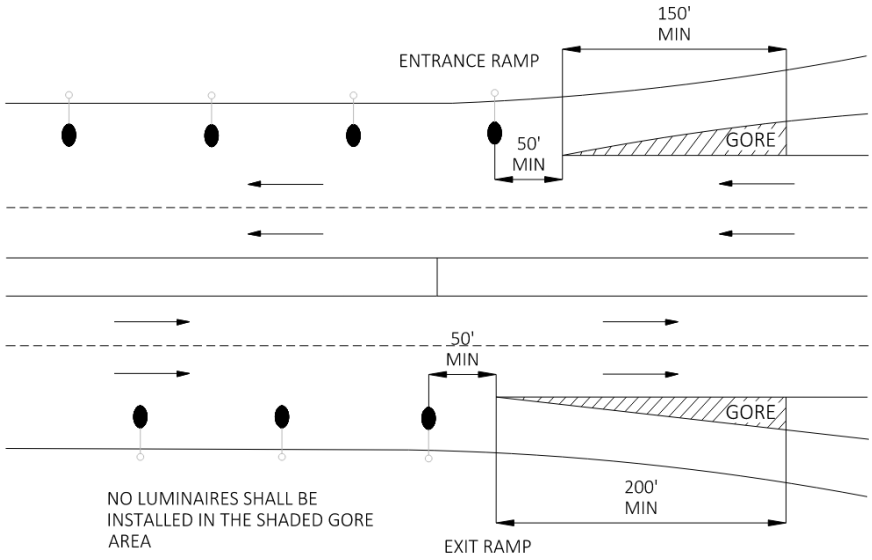
ROADWAY LIGHTING LAYOUT

Light poles *should* be located according to these considerations:

- Poles **shall** meet the design criteria as presented in TEOpS 11-3.
- Pole placement *should* ensure illumination of conflict areas and merge points.
- Minimize the impedance of approach signage sight lines.
- Use engineering judgment to determine appropriate light pole locations that *may* be too close to errant vehicle paths.
- Coordinate all clear zone and roadside sloping issues.

When auxiliary lanes or exit and entrance ramps adjacent to the mainline roadway require additional luminaires, the first luminaire is generally placed within 50 feet from the point of taper from the mainline roadway. The designer *should* avoid locating luminaires inside the gore area of an entrance ramp within 150 ft from the tip of the gore, as well as inside the gore area of an exit ramp within 200 ft of the tip of the gore, see the figure below.

Figure 4. Freeway Typical Roadway lighting Placement at Interchanges



DESIGN PROCEDURAL REQUIREMENTS

The designer **shall** contact the Regional Lighting Engineer to verify roadway and pedestrian/land use classifications prior to beginning the roadway lighting design.

The designer *should* prepare illumination calculations using AGI32 software using the calculation boundaries described in this document.

The designer **shall** submit the completed illumination design to the Regional Lighting Engineer for review and approval. The illumination design **shall** include:

- Design layout
- Photometric calculations with summary information showing compliance with illumination and uniformity criteria.
- Product cut sheets for any luminaires not listed on the QPL.
- Documentation of any alternatives considered.

11-4-6 Roadway & Pedestrian Lighting Roadside Facilities April 2024

APPLICATION

This policy and the related information apply to all WisDOT maintained weigh stations, rest areas, park and rides, crash investigation sites, and waysides on the State Trunk highway systems.

POLICY

All WisDOT maintained roadside facilities **shall** be illuminated.

The designer **shall** coordinate with the WisDOT Bureau of Highway Maintenance (BHM) and Regional Lighting Engineer to determine power supply requirements for the roadway lighting system. Roadside facilities *may* be maintained by multiple WisDOT entities, and an independent power supply for outdoor roadway lighting, buildings, and other uses *may* be necessary.

DESIGN CONSIDERATIONS

The designer **shall** work with the BHM and respective Regional Lighting Engineer to determine whether high mast or conventional roadway lighting *should* be installed at the roadside facility. Larger facilities such as rest areas and weigh stations *may* justify the installation of high mast roadway lighting to illuminate large, paved areas with minimal space for conventional light locations.

Roadside facility illumination areas **shall** be calculated by using the illuminance method. Illuminance calculation areas **shall** be defined separately for parking areas, pedestrian areas, internal circulation routes, and entrance/exit ramps.

There *may* be multiple sources for obtaining illuminance target criteria depending on the facility type. The designer **shall** refer to the appropriate reference manual(s) as selected for use with the project.

Roadside facilities **shall** consider both vehicular and pedestrian traffic with the roadway lighting design. Some facilities *may* necessitate walkway lighting units to provide illumination for pedestrians. Lighting designs **shall** also consider that these facilities are often open to the public 24/7, so pedestrian security must be a factor when determining appropriate lighting levels at each site.

CALCULATION BOUNDARIES

The calculation boundary is the area to which the illumination criteria levels apply. Areas *should* be determined using engineering judgement to define boundaries between parking areas and ramps.

ROADWAY LIGHTING LAYOUT

Light poles *should* be located according to these considerations:

- Pole placement *should* ensure illumination of parking areas, internal roadways, conflict areas and merge points, high pedestrian traffic areas, such as walkways, and building entrances.
- Minimize the impedance of approach signage sight lines.
- Use engineering judgment to determine appropriate light pole locations that *may* be too close to errant vehicle paths.
- Coordinate all clear zone and roadside sloping issues.

DESIGN PROCEDURAL REQUIREMENTS

The designer **shall** contact the BHM and Regional Lighting Engineer to verify roadway and pedestrian/land use classifications prior to beginning the roadway lighting design.

The designer *should* prepare illumination calculations using AGi32 software using the calculation boundaries described in this document and in other pertinent manuals.

11-4-7 Transition Lighting - Roadways April 2024

APPLICATION

This policy and the related information apply to isolated roadway lighting segments on the State Trunk highway systems.

POLICY

Transition lighting *should* be provided at all roundabouts, isolated intersections, and isolated roadway segments requiring illumination where the approach roads are not illuminated, and have posted speeds greater than or equal to 35 mph.

DESIGN CONSIDERATIONS

Transition lighting is implemented to allow the users' eyes to adjust from the non-illuminated to the illuminated roadway surface. This gradual roadway lighting adjustment is accomplished incrementally based on the posted speed of the roadway. Recommended transition lighting distances between illuminated intersections and/or roadway segments *should* be based on Table 1.

Table 1. Transition Lighting Lengths

Posted Speed Limit (MPH)	30	35	40	45	50	55
Minimum Transition Lighting Distance (Feet)	150	175	200	250	275	325

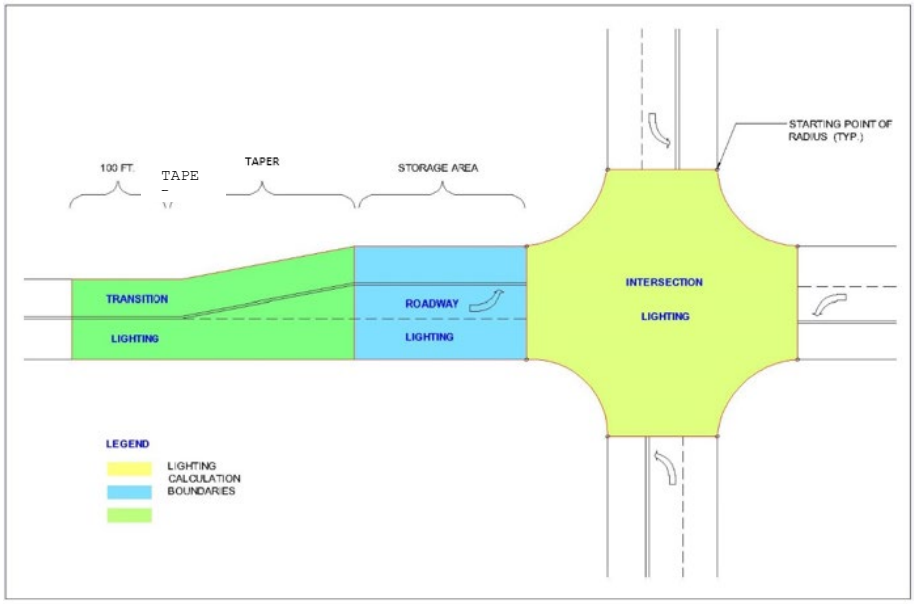
Transition lighting *should* be measured from the outside limits of the intersection and/or roadway calculation boundary when applicable.

Transition lighting for highway on/off ramps *should* be a minimum 275 feet or as dictated by design speed considerations.

Recommended distances for transition lighting can sometimes extend beyond WisDOT right-of-way. Local municipalities electing not to extend transition lighting to the recommended distance *should* address this condition in the local agreement.

Transition lighting levels *should* be designed based on the adjacent roadway lighting levels as summarized in Figure 1.

Figure 1. Intersection with Transition Lighting Calculation Areas



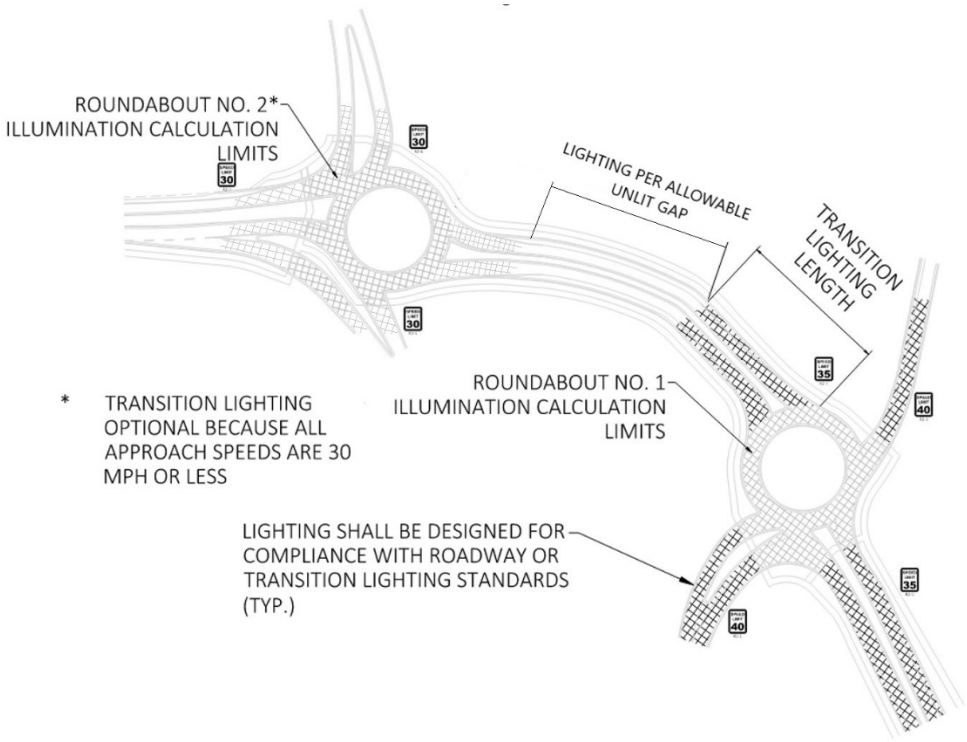
ROADWAY LIGHTING BETWEEN ADJACENT INTERSECTIONS

If multiple illuminated roundabouts or signalized intersections are placed adjacent to each other, e.g., freeway on/off ramps, the area between the intersections *should* be illuminated if the distance is less than or equal to that shown in Table 2. Illumination levels for the span of roadway between the intersections *should* be based on the illumination of the intersections. Include transition lighting if applicable.

Table 2. Allowable Unlit Gap Between Intersections

Allowable Unlit Gap			
Posted Speed Limit (MPH)	≤ 30	30 -45	> 45
Distance (feet)	500	750	1500

Figure 2. Sample Transition and Connection Distance Lighting Areas



11-4-8 Roadway Lighting – Temporary Lighting April 2024

APPLICATION

This policy and the related information apply to roadway segments requested for temporary roadway lighting on the State Trunk highway systems.

POLICY

The designer **shall** identify the need for any temporary roadway lighting as early in the project process as possible. Ideally, requirements for temporary roadway lighting will be identified during the scoping process and not later than during the TMP and be included in the 60% approval process. All temporary roadway lighting **shall** be approved by the Regional Lighting Engineer.

WisDOT generally reserves the use of temporary roadway lighting in work zones for the following cases:

- High volume freeways, roadways, and intersections that are currently illuminated.
- Complex work zones requiring unexpected maneuvers and conflict points.
- Signalized intersections and roundabouts
- Temporary lighting **shall** be provided for roundabouts that are open to traffic during construction staging. If practical, sections of the proposed permanent lighting *may* be installed and used for segments of the temporary lighting system.
- Urban roadways with significant concerns for pedestrian mobility and safety
- Roadside facilities

Temporary roadway lighting design **shall** be coordinated with the construction staging and maintenance of traffic planning for the project. The design **shall** include any temporary roadway lighting and/or relocated luminaires and all wiring required to maintain continuous operation of the existing roadway lighting systems.

DESIGN CONSIDERATIONS

This work **shall** be coordinated with the roadway design team and the maintaining authority. The extent of the proposed temporary roadway lighting system on a project **shall** be addressed as early in the submittal process as possible.

All modifications to the existing roadway lighting systems **shall** comply with WisDOT guidelines and design criteria.

In cases where temporary roadway lighting units on high-speed roadways are not shielded by a guardrail or barrier, the designer *should* consider wiring underground in a raceway to the luminaire location to protect against additional knockdowns from vehicle impact and safety concerns due to downed power lines.