



CHAPTER I HIGHWAY LIGHTING POLICY

1. HIGHWAY LIGHTING POLICY

1.1 Introduction

This lighting policy, which was approved and adopted by the Missouri Highway and Transportation Commission, has been revised to set forth the guidelines governing lighting projects proposed by other political subdivisions for installation on state maintained highways. All previous policies for highway lighting are now void.

Also integral to this policy is Section 8-01 of the Project Development Manual. The Project Development Manual is used to assist in the design of lighting intensity and location of lighting standards and luminaires, when the criteria is not covered in this manual.

All roadway lighting proposals and "Dusk-to-Dawn" lighting proposals within the scope of this policy may be approved by the district office. Special cases that are not covered by this policy shall be submitted to General Headquarters Traffic for approval. Policy guidelines are as follows.

1.2 Lighting Permits

Permits for lighting will be granted only to a political subdivision, which includes public utilities. The installation, operation and maintenance of highway lighting projects proposed by other political subdivisions shall be at the expense of the political subdivision.

When any lighting installation or system ceases to be maintained or operated for a period of thirty (30) calendar days, notice shall be given in writing to the political subdivision to whom the permit for installation was issued. The notice will advise the political subdivision that if the lighting is not restored or work begun to restore in fifteen (15) calendar days from the date on the notice, such lighting will be considered a hazard and subject to removal by state forces with all materials and equipment removed becoming the property of the department for disposal or other use as deemed appropriate.

1.3 Continuous Versus Intersection Lighting

Roadway lighting proposals shall abide by the criteria described herein for either the continuous or intersection classification.

Typically, intersection lighting is utilized at isolated intersections and is allowable where a proposed intersection installation is at least 500 feet from an existing lighting installation or cross-street intersection.

Continuous lighting shall be provided when the proposal includes the lighting of two or more intersections less than 500 feet apart, typically in urban or suburban areas. Where an intersection is not involved, continuous lighting can be considered if the length of roadway to be lighted is at least 500 feet.

For proposals involving diamond interchanges or at-grade intersections on divided highways, it is not permissible to light only one ramp terminus or outer road intersection. If it is desirable to light the intersection of outer road and cross-street, lighting at both ramp terminals (diamond interchange) or at-grade intersection is first required.

1.4 Required Illumination and Uniformity Ratio

1.4.1 Maintenance Factor

When computing average maintained intensity for continuous or intersection lighting, use a maintenance factor of 0.7 for all mounting heights.

1.4.2 Continuous Lighting

1.4.2.1 Average Maintained Intensity

Continuous lighting installations along freeways, urban arterials, expressways and ramp connections thereto shall provide an average maintained intensity of not less than 0.6 footcandle and a minimum intensity of not less than 0.2 footcandle. Continuous lighting installations on existing roadways, not including freeways, urban arterials, expressways or ramp connections thereto, must provide an average maintained intensity of not less than 0.4 footcandle and a minimum intensity of not less than 0.2 footcandle.

1.4.2.2 Uniformity Ratio

The uniformity ratio is the ratio of average footcandles of illuminance on the pavement area to the footcandles at the point of minimum illuminance on the pavement. Continuous lighting must provide a uniformity ratio of 4:1 or better for 45 foot mounting heights and 6:1 or better for 30 foot mounting heights.

NOTE: When ornamental lighting is proposed, the veiling luminance ratio of 0.3:1 is required. This is the max ratio of veiling luminance to average pavement luminance.

1.4.3 Intersection Lighting

Luminaires at intersections shall be located to furnish silhouette discernment lighting unless raised islands or medians are present at which time direct reflectance illumination shall be used. Basic lighting at intersections and interchanges must provide an average maintained intensity of not less than 0.6 footcandle. See the Project Development Manual for examples of typical layouts.

1.5 Lamp Rating

The following establishes the minimum acceptable initial lamp rating by roadway classification.

1.5.1 Expressway and Freeway Lighting

1.5.1.1 Continuous, Basic Interchange, Ramps and Cross Street Lighting

Lamps shall have an initial rating of 9,500 lumens or greater for 30 foot mounting height. Lamps shall have an initial rating of 21,000 lumens or greater for 45 foot mounting heights. See [Figure 1.2](#) for possible lamp wattages and mounting heights to meet this criteria.

1.5.1.2 All Other Highways for Continuous or Intersection Lighting

Lamps shall have an initial rating of 7,950 lumens or greater for 30 foot mounting heights. Lamps shall have an initial rating of 21,000 lumens or greater for 45 foot mounting heights. See [Figure 1.2](#) for possible lamp wattages and mounting heights to meet this criteria.

1.6 Horizontal Location of Luminaires

Luminaires should be positioned within 3 feet at the 30 foot mounting height and 5 feet at the 45 foot mounting height from the edge of the nearest traffic lane. This applies to either continuous or intersection lighting. For intersections, see the Project Development Manual for layouts.

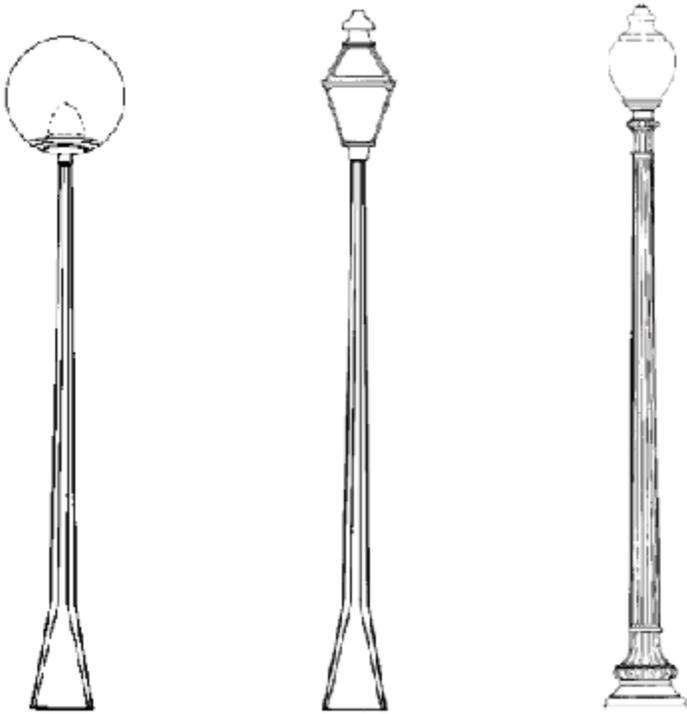
1.7 Lighting Style, Luminaire Type and Mounting Height

1.7.1 Roadway Luminaires

The "cobrahead" or "horizontal" luminaire design is recommended for all highway lighting installations. Lamp data, recommended luminaire type and mounting heights for these type of luminaires can be found in [Figure 1.2](#).

1.7.2 Ornamental Lighting

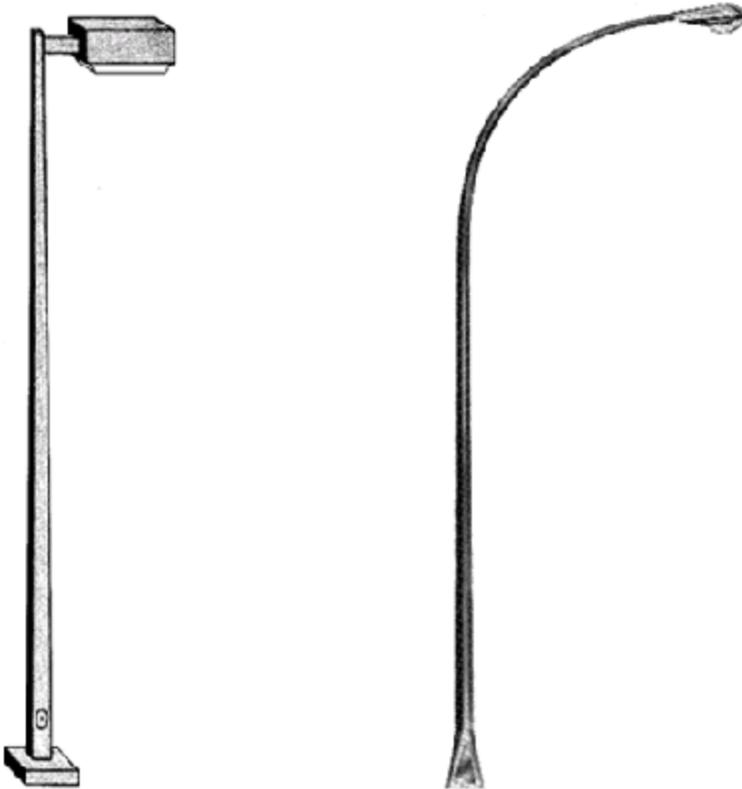
Ornamental lighting requests are very popular in historic areas. However, there are few manufacturers that actually make an ornamental fixture for roadway lighting. When the intent of the ornamental lighting fixtures is to light the roadway, they must meet the illumination and uniformity ratio as well as the veiling luminance criteria established in [Section 1.4](#). Computer calculations must be submitted with the proposal. If they do not meet this criteria, these fixtures may be allowed for lighting of sidewalks and pedestrian areas only.



EXAMPLES OF ORNAMENTAL LIGHTING

1.7.3 Architectural Street Lighting

Architectural street lighting may be allowed if the design conforms to the required illumination and uniformity ratio for continuous lighting as established in [Section 1.4](#). Computer calculations must be submitted with the proposal.



EXAMPLES OF ARCHITECTURAL LIGHTING

1.8 Pole Location

Lighting poles shall be located at the least hazardous location with respect to traffic and the least obstructive for maintenance operations. The American Association of State Highway and Transportation Officials (AASHTO) clear zone guidelines from the *Roadside Design Guide* are used to determine the desired distance for pole installation. [Appendix A](#) shows the clear zone information.

When determining the clear distance required it should first be checked to see if a clear zone has been previously established for the route by design. If a clear zone has not already been established then the higher of either the posted or 85th percentile speed should be the determining factor. This will provide the greatest margin of safety.

If poles cannot be placed at or outside of the clear zone distance, the pole may be placed within the clear zone if the poles have the appropriate breakaway device. However, the minimum distance a pole can be placed is 2 feet behind the face of the curb or shoulder point.

Wood poles or poles without the breakaway feature are acceptable only when located at or beyond the distance required by the clear zone guidelines or where several other non-breakaway obstacles are located in the vicinity of the proposed installation. In the latter case, it is recommended to send all proposals and district recommendations to the division office for approval.

Poles may be located behind existing guardrail if protected from all directions of travel. If located behind guardrail, poles shall be offset sufficiently to allow for deflection of the guardrail under impact, see MoDOT Standard Drawing 606.00 for offsets.

If proposals are sent to the division office for review, all locations shall be field checked by district personnel and photographs and plans of the proposed location shall be submitted.

1.9 Safety Bases and Material Composition of Poles

Proposed lighting projects must utilize steel or aluminum poles with acceptable safety bases when within the distance obtained from the clear zone guidelines. Safety bases shall be certified as meeting the breakaway criteria and structural requirements as set forth by the current AASHTO specifications. The applicant may use fiberglass poles provided that the manufacturer certifies the poles meet AASHTO criteria for breakaway features. This certification must be included in the submittal. A fused slip connector assembly shall be required wherever safety bases are required. (See MoDOT Standard Drawing 901.02.)

A proposed extension or addition to a lighting facility previously installed by the state should utilize material similar to the existing lighting poles.

1.10 Wiring

Where breakaway bases are required, overhead wiring will not be permitted. In cases where wood poles or poles without the breakaway feature are permissible, overhead wiring will be permitted. Where overhead wiring is permitted, cable crossings will not be permitted from pole to pole on a staggered pole arrangement. Only normal cable crossings will be permitted to complete circuit wiring.

1.11 Typical Designs for Intersection Lighting

The Project Development Manual should be used as a guide for typical design of intersection lighting.

1.12 Typical Designs for Continuous Lighting

The table in [Figure 1.1](#) and figures in the Project Development Manual list typical continuous lighting designs for different roadway width, luminaire and mounting height combinations. Various brands of luminaires perform slightly different; therefore, these tables should be used as a guide.

If proposals are different than the examples, computer calculations shall be submitted to justify luminaire, type, mounting height and/or spacing.

1.13 Submittal

Applicant must provide two complete sets of plans to the district office. Plans must be drawn to scale showing proposed lighting installation(s), width of pavement and shoulders, right of way limits, traffic islands, guardrail, power poles and other non-movable obstacles. The applicant should also fill out Part A of the "Permit Request Form For Roadway Lighting" found in [Figure 1.3](#).

The district must conduct an on-site investigation of the proposed installation to verify applicant's plans and completed Part B of the "Permit Request Form For Roadway Lighting" found in [Figure 1.3](#). If the proposal meets the policy outlined in this manual, the district may approve the request and a permit may be issued for the installation. All plans, photos and permit request forms shall be filed with the permit.