

APPENDIX D

Roundabout Lighting Review

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Roundabout Lighting Review

One of the tasks in the project SPR-3530 is to review roundabout lighting practices. The key aspects that were of interest in identifying are: 1) consensus on whether roundabouts should always *require* lighting; and 1) recommendations on roundabout lighting *configurations*. The research team searched for state highway design manuals and guidelines to determine consensus for roundabout lighting. This technical memorandum reviews current state department of transportation (DOT) roundabout lighting policies as well as guidelines from the Federal Highway Administration (FHWA).

Roundabouts are a relatively new intersection design in the US. While some communities have been “early adopters” of roundabouts, the majority of states have yet to accumulate experience with their design and operation. Of the states where guidance documents on roundabouts were retrieved in the search, there was a clear, unequivocal consensus that *roundabouts should be lighted*. The only barrier to roundabout lighting identified in the source documents are institutional considerations, particularly the funding source for the construction and maintenance of the lighting infrastructure.

As of 2012, at least nine DOTs have statements in their manuals or guidelines state that lighting is *required* at roundabouts, while another five *recommend* or *warrant* lighting. Table 1 gives an overview of the findings from this review. The statements found within these documents that lead to the conclusion of the state of practice are quoted in the following section. In addition to state policies and guidelines, the “informational guides” provided by the Federal Highway Administration have also recommended the lighting of roundabouts.

With regard to lighting configurations, there was considerable variance from one document to another in the level of detail in recommendations for lighting plans. Some states deferred to other reference material such as those provided by the Illuminating Engineering Society (IES). Others were more specific in providing preferred designs. The research team recommends that INDOT review these state practices to determine the appropriate level of detail to include in the Indiana design manual.

The source material specific to requirement or recommendation of roundabout lighting is summarized in the following pages of this memorandum. The source material, including recommendations on lighting configuration, have been compiled in a companion binder to this memorandum.

Table 1. US States with roundabout lighting policies found in this search.

| State | Roundabout Lighting Practice | Reference |
|---------------|-------------------------------------|------------------|
| Colorado | warranted | [2] |
| Delaware | required | [3] |
| Florida | required | [4] |
| Georgia | required | [5] |
| Illinois | recommended | [6] |
| Kansas | required | [7] |
| Kentucky | required | [8] |
| Maryland | required | [9] |
| Michigan | recommended | [10] |
| Minnesota | recommended | [11] |
| New Hampshire | required | [12] |
| New York | recommended | [13] |
| Washington | required | [14] |
| Wisconsin | conditionally required | [15] |

Roundabout lighting statements from various sources discovered in the literature search are provided here. In addition to state policies, a national perspective is included with a review of the primary FHWA guidance document.

Roundabouts: An Informational Guide

- “For the roundabout to operate satisfactorily, the driver must be able to enter the roundabout, move through the circulating traffic and separate from the circulating stream in a safe and efficient manner. To accomplish this, the driver must be able to perceive the general layout and operation of the intersection in time to make the appropriate maneuvers. Appropriate lighting is therefore required at all roundabouts on state and local roads.” [1]
- “Illumination is recommended for all roundabouts, including those in rural environments. However, it can be costly to provide if there is no power supply in the vicinity of the intersection. Where lighting is not provided, the intersection should be well signed and marked (including the possible use of reflective pavement markers) so that it can be correctly perceived by day and night, recognizing that signing and markings alone cannot correct for the limited view of headlights when circulating.”

Colorado

- “Lighting is warranted for all roundabouts.” [2]

Delaware

- “All roundabouts, with the exception of those located wholly within commercial or residential developments, shall be illuminated. This includes roundabouts on external roadways that serve as development entrances. Roundabouts shall not require a warrant analysis.” [3]

Florida

- The statement from Chapter 8 of *Roundabouts: An Informational Guide* is quoted (see above). [4]

Georgia

- “The lighting of a roundabout has been identified by the Department as having substantial importance to the operational performance and safety of a roundabout such that special attention should be given to the design decision.” [5]
- “A written commitment letter must be received from a local government agreeing to share the costs of lighting (by funding the energy, operation and maintenance of the lighting system) in order for the proposed roundabout to move forward to detailed design.”

Illinois

- “Consider lighting at roundabouts as recommended by the AASHTO publication *Roadway Lighting Design Guide*.” [6]

Kansas

- “Lighting is required for roundabouts on the Kansas state highway system.” [7]

Kentucky

- “Intersection control involving a roundabout shall be a warranting condition for intersection lighting.” [8]
- “Contrary to typical intersection lighting, the Cabinet shall be responsible for the installation costs associated with the lighting of roundabouts within city limits. However, cities should be responsible for the maintenance and utility costs associated with these installations.”

Maryland

- “It is the Administration’s policy to light all roundabouts.” [9]

Michigan

- “In accordance with federal guidelines, the *Michigan Roundabout Guide* recommends lighting at roundabouts; however, Public Act 51 does not allow the department to pay for the installation and operation of lights, except on freeways. Without alternative methods of payment for lighting installation and maintenance, we are unable to construct roundabouts that fully meet federal and state guidelines.” [10]

Minnesota

- “Chapter 7.3 of the FHWA document *Roundabouts: An Informational Guide* contains information on the illumination of roundabouts. The document states that the need for illumination varies somewhat based on the location in which the roundabout is located (urban, suburban, or rural conditions). Generally, roundabouts should always be lit.” [11]

New Hampshire

- “As a minimum the ends of the splitter islands and crosswalks should be lit so drivers can observe pedestrians and recognize the approaching splitter islands and roundabout.” [12]

New York

- “While Department policies and designer guidance on this subject are all still in draft form, all information points to the need to light roundabouts.” [13]
- The NYSDOT Highway Design Manual chapter on highway lighting is currently dated 08/04/95 (<https://www.dot.ny.gov/divisions/engineering/design/dqab/hdm>).

Washington

- “Provide illumination for each of the conflict points between circulating and entering traffic in the roundabout and at the beginning of the raised splitter islands. Illuminate raised channelization or curbing. Position the luminaires on the downstream side of each crosswalk to improve the visibility of pedestrians. Light the roundabout from the outside in toward the center.” [14]

Wisconsin

- “A driver must be able to perceive the general layout and operation of an intersection in time to make appropriate maneuvers. Whenever a facility is designed for use by several user groups (motor vehicles, pedestrians, and bicycles or mopeds), the roundabout must be illuminated. Therefore, adequate lighting needs to be at all roundabouts.” [15]
- “When state and/or federal funds are used they should pay 100 percent of the initial installation cost for non-decorative lighting fixtures and materials. The ownership type will determine whether the equipment maintenance and the electricity use is paid by the local unit of government or the State. When the lighting is on a local highway system or a connecting highway the local unit of government is responsible for the cost associated with maintenance of the equipment and the electricity use. For roundabouts on state highways, the lighting equipment maintenance and electricity may be paid by the State.” [15]

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