

Intersection Lighting

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Iowa Department of Transportation
Federal Highway Administration
(InTrans Project 12-452)

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Description

Intersection crashes during nighttime hours may occur due to drivers being unable to see conflicting traffic or because the driver is unaware of the intersection until it is too late to avoid a collision. In rural areas, typically the only source of lighting is provided by vehicle headlights. Roadway lighting provides greater intersection visibility of the intersection, signs, and markings (Atkinson et al. 2014; Neuman et al. 2003). Even when only a single light is used, lighting may also indicate an upcoming intersection and alert drivers to changing roadway conditions.

Placement

Lighting is best for intersections with a high number of nighttime crashes. In particular, rear-end, right angle, and turning crashes may suggest that drivers are unaware of the intersection (Atkinson et al. 2014). As noted by Neuman et al. (2003), the keys to successful application of lighting are to identify sites where lack of lighting is a significant contributing factor to nighttime crashes and to develop an appropriate lighting system using criteria from the Illuminating Engineering Society of North

America and the American Association of State Highway and Transportation Officials.

Chapter 6 of the *Iowa DOT Traffic and Safety Manual* and Chapter 11 of the *Iowa Statewide Urban Design Standards* (SUDAS 2014) discuss warrants for lighting (Iowa DOT 2014).

Effectiveness

A study in Iowa showed that the mean number of nighttime crashes at intersections with no lighting is two times higher than locations where lighting is present (Isebrands et al. 2010).

As noted in the table below, a number of studies have been conducted that show the benefits of lighting at rural unsignalized intersections.

Advantages

- Shown to be effective overall
- Can be installed in a reasonable time frame

Disadvantages

- Requires power source which may be problematic in remote rural areas
- Cost

Author	(R)ural/ (U)rban	Study location	Sample size	Change in nighttime crashes
Carstens and Berns 1984	R	IA	91	None
Roberts and Walker 1976	R	IA	47	-49%
Isebrands et al. 2010	R	MN	33	-37%
Green et al. 2003	R/U	KY	9	-45%
Preston and Schoenecker 1999	R	MN	12	-25 to -40%
Wortman et al. 1972	R	IL	NA	-30%



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