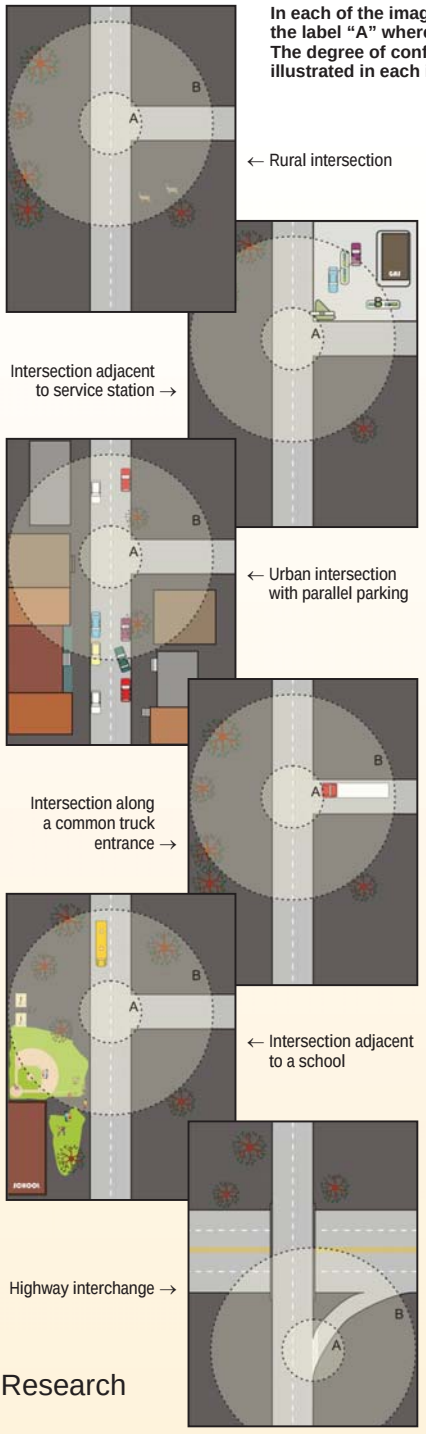
Does street lighting improve safety?

Street lighting is installed to reduce crash risk at night. Obviously, fixed street lighting is installed to improve visibility, and it can be shown that in many cases fixed lighting increases the visibility of targets in and around the roadway over headlights alone. It has never been shown, however, that there is a direct statistical reduction in crash risk due to the presence of street lighting. A comprehensive literature review suggested that fixed lighting reduces crash risk by approximately 30%.

The LRC and Pennsylvania State University have been supported by the National Cooperative Highway Research Program (NCHRP), part of the National Academy of Sciences, to see if a statistically reliable association could be made between the presence of street lights and reduction in crash risk or reduction in crash severity. Databases from Minnesota and California were used in the analyses because these are the only two states that have electronic databases amenable to determining whether there is a reliable association between fixed lighting and crash risk.



In each of the images, the immediate conflict area is denoted by the label "A" whereas areas of possible conflict are labeled "B." The degree of conflict will depend upon the specific location, as illustrated in each image.

Surprisingly, fixed lighting was associated with an increase in crash risk during the day as well as an increased crash risk at night at intersections in both California and Minnesota. There was a lower increase, however, in crashes at night, indicating that fixed lighting probably does reduce crash risk by between 12% and 14%, a much lower estimate of the suggested benefits of fixed lighting from the literature review. This difference between the literature review and the statistical analysis, together with the finding that there was an increased crash risk during the day, indicates that fixed lighting cannot be considered in isolation. Many other factors associated with the presence of fixed lighting affect crash risk.

Nevertheless, this study shows a statistically reliable reduction in crash risk due to the presence of fixed lighting, corroborating for the first time the implicit assumption that measured or calculated improvements in visibility probably translate into improvements in traffic safety.

Sponsor

National Cooperative Highway Research Program (NCHRP)

Rensselaer

View LRC Project Sheets at
www.lrc.rpi.edu/resources/newsroom/projectsheets.asp

Lighting Research Center

Lighting Research Center, Rensselaer Polytechnic Institute • 21 Union Street • Troy, NY 12180 • (518) 687-7100 • www.lrc.rpi.edu