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Do LED Traffic Signals Make You Safer on the Roads?

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Brighter, more energy-efficient light-emitting diodes in traffic signals are touted to increase driver safety at intersections. But, they actually may decrease driver safety, according to a University of Dayton pilot study published in the Institute of Transportation Engineers’ ITE Journal.

Accidents at eight intersections in Middletown, Ohio, from 1999 to 2007, increased 71 percent after converting traffic signals from light bulbs to LEDs. Based on crash data before the switch to LED signals, the researchers used a formula known as the empirical Bayes analysis to predict approximately 75 crashes would occur at the eight intersections after the change. Instead, there were 129 accidents.

Authors Deogratias Eustace, University of Dayton assistant civil engineering professor; Peter Hovey, University of Dayton associate math professor; and Valerie Griffin, city traffic engineer for Middletown; wrote the study as an exploratory one. They said more research is needed to see if LEDs are actually the cause for the increase in accidents or if other factors such as increased traffic volume or changes in traffic patterns played a role. In addition, different LED specifications were used for older fixtures. The visual quality of the older fixtures is noticeably different from new models, according to the study.

"Future studies are required to expand from this one to investigate further and determine the long-term safety benefits associated with LED use in traffic signals," the group wrote in its study. "LED traffic signals have become the national standard. They are less expensive to maintain and provide more reliability than traditional incandescent bulbs. However, with all these benefits, if they deteriorate the intersection safety, they will be undesirable."

Mike Spack, president of Spack Consulting and Traffic Data Inc. and adjunct professor in the University of Minnesota's civil engineering department, called the study alarming on his blog "Mike on Traffic." He, too, said he hoped the Federal Highway Administration and other agencies further study LEDs.

"Traffic engineers assumed the brighter LED indications would be safer than incandescent bulbs because of better visibility," Spack said. "We need to go back to the drawing board if the current style of LED indications are causing a 71 percent increase in crashes."

Traffic signal bulbs account for approximately 90 percent of the total energy use at typical intersections, according to the study. Converting bulbs to LEDs can cut energy consumption by about 80 percent.

LEDs have other benefits. They do not burn or distort lens covers, they may help preserve intersection wiring by drawing less power, and they appear brighter than conventional signals.

Chicago, Portland, Ore.; Cleveland, Denver, Little Rock, Ark.; the state of Wisconsin and the state of California are among the jurisdictions that have changed or are changing traffic signals to LEDs.

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