

New instrument that measures LED intensity could help cities with traffic light maintenance

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(Phys.org)—In many of the nation's traffic lights, light-emitting diodes or LEDs with their brighter light and longer life have replaced standard bulbs. But knowing when to replace the signal heads has remained a guessing game, says Dr. Suzanna Long, assistant professor of engineering management and systems engineering at Missouri University of Science and Technology. That's because LED traffic lights don't burn out - they just lose brightness over time.

So Long and other researchers at Missouri S&T, in partnership with the Missouri Department of Transportation, have developed an instrument to measure [LED](#) intensity. The laser-guided device allows measurements to be taken from the roadside at night, instead of requiring technicians to physically check [traffic lights](#) by using a bucket truck.

Long's team created the measurement tool while working to provide MoDOT with a data-driven replacement schedule for LEDs, which have been widely adopted for use in sustainable traffic signal management.

"The majority of agencies replace LED signals on a spot basis when they receive a complaint," she says. "The maintenance costs associated with sending a crew out to replace a single LED are very high. Our methodology provides a more cost-effective mechanism for determining replacement and allows agencies to meet goals of being good stewards of public money."

Long says in addition to addressing individual complaints about brightness, transportation officials have used a generic replacement schedule based on the manufacturers' warranties, usually six years. But since life expectancy of LEDs varies by intersection and the basic science of LED components, that's not the most cost-effective schedule.

Results of this study, named one of the 2012 "Sweet 16" High Value Research Projects by the American Association of State Highway and Transportation Officials, appears in the *Engineering Management Journal's* special issue on transportation management this month.

The team plans to extend the previous data and collect data from the same LED traffic indicators in the coming years to improve the reliability and accuracy of their results.

Provided by Missouri University of Science and Technology

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