

New technology paves the way for fewer orange barrels and safer, quicker road repairs

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A Purdue University team developed a method and equipment to better repair paved roadways and highways using electrical resistance measurements to measure the optimum curing time for asphalt emulsions. Credit: Purdue University



Imagine a drive to grandma's house or to work with fewer "left lane closed ahead" signs, fewer detour signs, fewer orange barrels and also safer travel near road crews. That may soon be possible with new technology from Purdue University researchers.

The Purdue team developed a method and equipment to more easily determine when <u>chip</u> sealed roadways can be returned to service.

This technology uses electrical resistance measurements to determine when the emulsified asphalt in a chip seal has sufficiently cured and can therefore withstand traffic without sustaining damage. Such real-time measurements help ensure that the <u>road</u> repairs are done correctly and more quickly than using current methods.

"Typical approaches to quantify emulsified asphalt-based chip seal curing times are varied and qualitative," said John Haddock, a professor of civil engineering and the director of the Indiana Local Technical Assistance Program, who leads the research team. "Having a quantitative, real-time measurement method can help construction crews make good decisions that result in a quality chip seal project with minimal traffic disruption."

According to the National Asphalt Pavement Association, the United States has more than 2.7 million miles of the paved roads and highways; <u>asphalt</u>-surfaced roads account for 94 percent of the roads.

Haddock said there are currently no good field techniques available to determine the achievement of sufficient mechanical strength to allow the return of traffic to recently chip sealed pavements.

Field personnel determine the sufficient curing of emulsified asphalts based on their experience. He said subjective determination of sufficient curing may shorten the pavement service life.



"Our equipment can help ensure quality of materials used on the project, prevent minimal windshield claims and chip seal repair work, prevent unnecessary construction delays, provide safety for the public and <u>construction workers</u>, and ensure a successful chip seal project," Haddock said.

The timing and frequency of measurements with the Purdue technology are without limit. Field tests indicate that chip seal systems gain significant mechanical strength when the initial electrical resistance measurement increases by a factor of 10.

Provided by Purdue University

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