



# SHORT-TERM PERFORMANCE OF PLANT-MIXED WARM-MIX ASPHALT

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**ATREL Classroom  
1611 Titan Drive, Rantoul, Illinois**

*Pizza and soft drinks will be provided*



## Abstract:

Warm-mix asphalt (WMA) has gained increased attention in the pavement industry due to its environmental benefits related to lower construction temperatures. WMA could be especially useful in the northern United States if it could be applied to heat-sensitive mixes, such as stone mastic asphalt (SMA) with polymer or ground tire rubber (GTR) modified binder. However, before using these SMA mixes with warm mix additives, their performance needs to be examined. The objective of this study is to verify the early-age performance of a warm SMA with an Evotherm additive. To this end, both an Evotherm SMA and a control conventional SMA were evaluated and compared using in-situ lightweight deflectometer (LWD) testing and comprehensive laboratory tests, including complex modulus, wheel track, indirect tensile (IDT) strength, and semi-circular bending (SCB) fracture. Gyratory-compacted specimens using fresh plant mixtures without reheating were tested in the lab at various curing periods; LWD tests were conducted in the field directly on an Illinois Tollway expressway overlay near Chicago right after compaction and at regular intervals for 24 hrs. The results showed that at the same curing period, the early-age performance of the Evotherm SMA was generally comparable to that of the conventional SMA. The curing process increased the dynamic modulus of both Evotherm SMA and conventional SMA, but did not significantly affect other laboratory test results. The on-site modulus of the Evotherm SMA was found slightly less than that of the conventional SMA at the same temperature. However, due to the lower compaction temperature, the pavement constructed with the Evotherm SMA could still be opened to traffic earlier than the pavement constructed with the conventional SMA, while providing the same modulus.

## Bio:

Zhen Leng is currently a Postdoctoral Research Associate at the Illinois Center for Transportation. He received both his Bachelor and Master degrees in Traffic and Civil Engineering from the Southeast University in Nanjing, China. In December 2011, he received his PhD degree in Civil Engineering from the University of Illinois at Urbana-Champaign, with Prof. Al-Qadi as his advisor. Zhen's research interests mainly include two areas: sustainable pavement materials and technologies, and nondestructive evaluation of transportation structures. During the course of his PhD study, Zhen has received several national awards, such as the Eisenhower Transportation Fellowship in 2010 and the Second-Place Winner of the Federal Aviation Administration (FAA) Design Competition for Universities in 2009.