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**ADVANCED MODELING AND SIMULATION OF IN-SERVICE
ASPHALT PAVEMENTS USING CREEP COMPLIANCE DATA
AND COMPARISON WITH FIELD EVALUATION**

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ABSTRACT

This paper presents some results of laboratory creep compliance characterization of asphalt layers, deflection testing and in situ pavement performance evaluation, and advanced finite element computer simulations of an in-service asphalt highway pavement in northern Mississippi. The virgin asphalt and polymer-modified asphalt mixes used on several test sections of the I-55 highway rehabilitation project are compared. The laboratory creep compliance data for asphalt and polymer-modified asphalt binders were measured at low temperatures using a modified test procedure for the Bending Beam Rheometer machine acquired for Superpave Asphalt Laboratory at the University of Mississippi. The creep compliance data of the binder is used as an input to simulate creep compliance behavior of the asphalt mix. Asphalt mix specimens, prepared using a gyratory compactor, were also tested to measure creep compliance at a range of service temperatures. The field evaluation confirms the relatively poor performance of the virgin asphalt section with respect to rutting.

KEY WORDS: Pavement, polymer-asphalt, Superpave, deflection, simulation