

Period Covered: October 1, 2007 through December 30, 2007

KSDOT Progress Report
for the

State Planning and Research Program

PROJECT TITLE: Implementation Of The 2002 AASHTO Design Guide For Pavement Structures

PROJECT MANAGER: Richard L. McReynolds, P.E., Admin. Contact Dr. Mustaque Hossain, KSU, PI	Project No: TPF-5(079) RE-0361-01	Project is: <input type="checkbox"/> PLANNING <input checked="" type="checkbox"/> RESEARCH & DEVELOPMENT
Annual Budget (active projects)	Multi Year Project Budget \$521,963	

Progress: The objectives of this research are to develop the calibration procedure for the NCHRP mechanistic empirical design guide (M-E PDG) models for both flexible and rigid pavement structures for this region and to assist the state highway agencies in region in the implementation of this Guide for pavement design and surface selection practices.

The research efforts to date concentrated on the development of a library of material characterization data for typical pavement materials and the identification of pavement test sections for which performance data may be available. A survey of literature has been conducted to identify existing material characterization data and pavement performance data collected already by the highway agencies and reported in internal documents. The testing program for measuring the dynamic resilient modulus of typical asphalt concrete mixes and the binder shear modulus and phase angle has commenced. Testing has been performed on more than 15 HMA mixes.

For all mixes tested, the measured dynamic moduli were compared with the moduli predicted by the Witczak equation and by the Hirsch model. The comparison revealed that, for all mixes, the measured moduli were 50 to 100 percent higher than the moduli predicted by the Witczak Equation. The Hirsh model severely under-predicted the dynamic modulus.

Two databases of required input data for the 1-37A models were created in the Access format for flexible and rigid pavement structures to ease the assembly of pavement construction and performance data for both rigid and flexible pavements. The data collected will allow runs of the 1-37A software to calibrate the model to local conditions when sufficient performance data will be available. The TrafLoad software has been used for axle load spectra extraction for the weight and classification stations that continuously recorded data for at least twelve continuous months. The traffic data collected in 2004, 2005 and 2006 has been processed for all stations that had sufficient data. More data is needed for some of the stations.

A new Pavement Performance Program was initiated. Five pavement sections, constructed in 2005, has been included initially in the program. More sections will be added in the years to come. The work conducted in the last quarter focused on the determination of the dynamic complex modulus of the HMA mixes and the resilient modulus of unbound materials used in the construction of the experimental test sections on I-495 in Long Island, New York.

Laboratory testing (dynamic modulus, Hamburg wheel loading, Tensile Strength Ratio (TSR)) was also performed for a WMA – HMA (warm mix vs. hot mix asphalt) comparison study. There was no major progress in work during the last quarter. Dr. Mustaque Hossain is the new P.I. of the project; Dr. Stefan Romanoschi moved to the University of Texas at Arlington (UTA). Part of the work on this project has been subcontracted to UTA.

SUMMARY OF ACTIVITIES EXPECTED TO BE PERFORMED NEXT QUARTER:

New major tasks were added to the work plan. These include the evaluation of reduction in pavement distresses for the composite pavement structures for NYSDOT due to the usage of new truck/semi-trailer configurations and the development of recommendations for the appropriate legal limits for the new vehicle configuration. To achieve the objectives, it is envisioned at this stage that at least two pavement sections in the New York state will be instrumented to measure pavement response under the loading of trucks with different configurations.

STATUS AND COMPLETION DATE

Percentage of work completed to date for total project is: 65%

X on schedule ___ behind schedule, explain

Expected Completion Date: December 31, 2008