

## **CE 890 Graduate Seminar**

- DATE:** October 1, 2008
- TIME:** 4:00 p.m. (refreshments served at 3:45 p.m.)
- PLACE:** Durland 1052
- SPEAKER:** Chandra Manandhar, Ph. D. Candidate
- TOPIC:** “Development of Laboratory-Based Accelerated Superpave Mix Testing Models Using Hamburg Wheel Tracking Device”

### **ABSTRACT**

The life of deficient Superpave pavements incorporating nonconforming mixtures can be estimated based on the Hamburg wheel-tracking device (HWTD) test results. HWTD is gaining popularity for testing rutting and stripping potential of asphalt pavements. However, the HWTD test takes about 6 to 6½ hours to complete a single test. This study is focused on reducing this test duration by developing accelerated mix testing models based on statistics.

Six fine-graded Superpave mixtures with 12.5 mm Nominal Maximum Aggregate Size (NMAS) have been selected for this study. Four mixtures were sampled from four different projects, each located in one KDOT administrative district and done by one contractor. Two mixtures with modified binders were selected from the pavements tested in the accelerated testing program in the Civil Infrastructure Systems Laboratory (CISL) at Kansas State University. Average number of wheel passes to 20 mm rut depth, creep slope, stripping slope, and stripping inflection point (SIP) in the HWTD tests were used in the statistical analysis to build accelerated mix testing models. The results show that good consistency between the predicted and observed test results was obtained when higher temperature and load levels were used. The test duration of HWTD can thus be reduced to two hours or less using accelerated testing (statistical) models. It is expected the use of HWTD will tremendously increase and it would be more effective for the quality assurance and quality control (QC/QA) of Superpave mixtures.