

CE 890 Graduate Seminar

Two presentations this week:

DATE: April 28, 2010
TIME: 4:00 p.m. (refreshments at 3:45 p.m.)
PLACE: 2144 Fiedler Hall

SPEAKER: Anup Adhikari (Advisor: Dr. Mustaque Hossain)
TOPIC: “Design of Chip Seal with Normal Weight Aggregate”

ABSTRACT

The more the recession is hitting most parts of the country every DOT in the country is facing dwindling budget. This has forced DOT to find different pavement preservation techniques. Chip seal as one of the surface treatment techniques seems to be promising preventive maintenance techniques. But as of today most of the agencies base their chip seal construction procedure on past experience rather than engineering principles. The project focuses on the development of the design criteria for chip seal construction. The study compares the compatibility between different types of aggregates and emulsions. Two types of normal weight aggregate crushed gravel (US-281, North of Great Bend) and limestone (US-56, Gardner & Edgerton) were selected for the test and as emulsion CRS-1HP and CRS-2P were used. The performance of the chip seal was tested by Hamburg Wheel Tracking Device (HWT) and Missouri Sweep Test. The samples for the Hamburg wheel tracking device were made on a slab of size $12\frac{3}{4} \times 10\frac{1}{4} \times 1\frac{6}{8}$ of asphalt mix SM-9.5A. The prepared samples were tested at 35 °C at wet conditions on HWT and the maximum rut depth was taken as performance criteria. The samples for the Missouri Sweep test were made on a circular felt disk of diameter 300 ± 10 mm and the prepared sample was tested by brooming operation. The percentage loss of aggregate was taken as performance criteria of the chip seal. Finally, the performance data were analyzed by statistical analysis.

SPEAKER: Srikanth Renikunta (Advisor: Dr. Yacoub Najjar)
TOPIC: “ANN-Based Program for 85th & 50th (Median) Speed Models”

ABSTRACT

In Kansas, the total length of the gravel roads is about 78,000 miles. Most of the gravel roads, in Kansas, regulated with the posted speed limit of 55 mph, which is generally posted for paved roadways. Speed regulations for paved roadways may not be suitable for gravel and sandy surface roadways. Regression- and Artificial Neural Network (ANN)-based models to predict 85th-percentile and 50th (median) speeds on gravel and sandy roads were developed based on field speed data sets. Those models indicated that the traffic speed strongly rely on road width, percentage of heavy vehicles, surface classification (G1, G2 or S) and posted speed limit. By utilizing the ANN approach, the prediction accuracy via ANN models was much improved over those obtained using Regression-based method.