

CE 890 Graduate Seminar

SPEAKER: Jeremiah Thomas, M.S. student (Advisor: Dr. Mustaque Hossain)

TOPIC: “Investigation of Aged Hot-Mix Asphalt Pavement Moduli”

DATE: February 16, 2011

TIME: 4:00 p.m. (refreshments at 3:45 p.m.)

PLACE: 2144 Fiedler Hall

ABSTRACT

The design and therefore, the performance prediction of a hot-mix asphalt (HMA) pavement are based on the initial properties of new aggregates and binder in the HMA mix. However, the traffic loading and the environment cause the pavement to deteriorate, and the initial properties of the HMA mix change. During the life of an HMA pavement, resurfacing and rehabilitation are required to keep the pavement in service. Therefore, the designer is faced with determining the structural characteristics of the aged HMA layers. Generally the HMA layers gain stiffness but may lose other properties such as, fatigue capacity that affect their performance.

In the newly released Mechanistic–Empirical Pavement Design Guide (M-EPDG), prediction of pavement response and performance must take into account fundamental properties of layer materials. Among these, the most important property of hot-mix asphalt (HMA) is the dynamic modulus of asphalt concrete. In the overlay analysis of existing HMA pavements, the modulus of the existing HMA pavements is characterized by a damaged modulus that represents the condition at the time of overlay placement. However, according to M-EPDG, the laboratory dynamic modulus tests are not needed for measuring the in-place modulus because the test must be performed on intact, but age-hardened specimens. In fact, M-EPDG contends that the resulting modulus values will likely be higher than those for new HMA mixtures. Thus, M-EPDG recommends that the modulus be determined from the deflection basin tests. This study investigates the moduli of HMA pavement layers from different nondestructive tests as well as from laboratory tests.