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MECHANISTIC-EMPIRICAL PAVEMENT DESIGN GUIDE IMPLEMENTATION

The recently introduced Mechanistic-Empirical Pavement Design Guide (MEPDG) and associated computer software provides a state-of-practice mechanistic-empirical highway pavement design methodology. The MEPDG methodology is based on pavement responses computed using detailed traffic loading, material properties, and environmental data. The responses are used to predict incremental damage (pavement distresses) over time. Design is an iterative process using analysis results against user input performance criteria. These criteria are established by policy decisions and represent the amount of distress or surface roughness that would trigger some major rehabilitation or reconstruction activity. The output of the computer software is a prediction of distresses and smoothness against set reliability values. If the predictions do not meet the desired performance criteria at the given reliability, the trial design is revised and the evaluation is repeated. The MEPDG methods provides for three hierarchical levels of design inputs to allow the designer to match the quality and level of detail of the design inputs to the level of importance of the project (or to best utilize available input data). In addition to inputs required to quantify a trial pavement structure, the MEPDG requires over 100 inputs to characterize traffic loading, material properties, and environmental factors.

Currently, the South Carolina Department of Transportation (SCDOT) designs flexible and rigid pavement structures using AASHTO regression equation methodology (1972 and later with some

modifications). Implementation of the MEPDG will require a substantial effort. This report summarizes an initial study undertaken to 1) gain an understanding of the new methodology, required inputs, and limitations, 2) conduct preliminary input sensitivity studies and review sensitivity studies performed by others, and 3) summarize implementation strategies undertaken or planned by other state highway agencies. Based on this investigation, general recommendations for SCDOT MEPDG implementation are proposed.

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