

## Mechanistic – Empirical Pavement Design

### **Problem: Empirical Design Process Restrict Performance Prediction**

Accurately predicting performance and durability is critical to improving the design of new and existing pavements. Poor performance increases traffic congestion, compromises public safety, and raises maintenance costs due to frequent repairs. Each year, transportation agencies spend more than \$20 billion in Federal funds to improve the Nation's pavements. Existing design procedures are based upon the 1950's AASHO Road Test and use empirical relationships. Presently, pavement designs often exceed the data limits and conditions used in the AASHTO Road Test have been exceeded. Pavement with expected traffic as much as 30 times greater are being designed using empirical procedures based upon the AASHO Road Test.

### **Solution: The Mechanistic Empirical Design Procedure**

The National Cooperative Highway Research Program (NCHRP) has developed a new pavement design and analysis tool, *The Mechanistic-Empirical Design Guide for New and Rehabilitated Pavement Structures*, under NCHRP 1-37A. The Guide, which is scheduled for release to State highway agencies as an NCHRP product in Spring 2004, employs mechanistic-empirical approaches. These approaches provide a more realistic characterization of in-service pavements and provide uniform guidelines for designing the in-common features of flexible, rigid, and composite pavements. By using these approaches, engineers can create more reliable pavement designs. The NCHRP 1-37 product offers procedures for evaluating existing pavements and recommendations for rehabilitation treatments, drainage, and foundation improvements. In addition, the new guide incorporates procedures for performing traffic analyses, includes options for calibrating to local conditions, and incorporates measures for design reliability. Engineers can use the guide to analyze common causes of pavement distress, including fatigue, rutting, and thermal cracking in asphalt pavements, and cracking and faulting in concrete pavements.

### **Deployment Process:**

The Federal Highway Administration (FHWA) organized the Design Guide Implementation Team (DGIT) to inform the FHWA division offices, State highway agencies, industry members, and other organizations and experts about the upcoming guide and to help potential users prepare for it. To introduce the guide and to discuss implementation issues, the DGIT has developed a one-day workshop. Seven of these workshops will be held across the Nation, starting on May 25, 2004, in Biloxi, MS. Other workshops will be held in Vancouver, WA (June); Indianapolis, IN (July); Hawaii (July); Mystic, CT (August); Kansas City, KS (September); and Phoenix, AZ (October).

The FHWA plans to develop additional State and regional workshops, training courses, and other educational resources over the next few years, as needed. As State agencies begin to implement the guide, DGIT will arrange small working sessions to address local technical issues such as calibration, new materials, and unique load configurations.

### **Additional Resources:**

For more information about DGIT and the workshops, or to download a flyer on new pavement design and construction methodologies, visit [www.fhwa.dot.gov/pavement/dgit.htm](http://www.fhwa.dot.gov/pavement/dgit.htm)

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