Development Of Bonded Concrete Overlay On Asphalt Design Method

Develop a mechanistic-empirical (ME) design method applicable in California road network and develop recommendations and guidelines for the use of Bonded Concrete Overlays on Asphalt.

WHAT IS THE NEED?

The California Department of Transportation (Caltrans) employs a variety of strategies and materials in maintaining and rehabilitating the state highway system’s pavements, a necessary approach given the varying characteristics of the pavements in use and their diverse properties. Bonded Concrete Overlay on Asphalt (BCOA) is a pavement rehabilitation alternative that has been frequently used on highways and conventional roads in several states and other counties, while its use has been very limited in California. Caltrans is interested in this technique and development of ME design method applicable to Caltrans road network.

WHAT ARE WE DOING?

Caltrans, in partnership with the University of California Pavement Research Center (UCPRC), will analyze the pros and cons of different ME Design Options. The study will identify the most important factors in thin BCOA performance, how those factors are addressed in current thin BCOA ME design procedures, and how they would be addressed if Caltrans decides to develop a new mechanistic-empirical (ME) design method. Caltrans will make decision of either developing a new design method to adopt an existing one or a hybrid of existing design methods.

The research team will then build experimental database for calibration of the procedure. The study will define a ME framework necessary for implementation into a design program.
The ME framework will require the incorporation of several modules, at least one for each of the following items: traffic, material properties, weather-related properties, structural response, and distresses.

Additionally, the research team will calibrate and validate proposed design method. The validity of design method will be evaluated by conducting a sensitivity analysis where the different input parameters will vary across a relatively wide interval. Several sources of experimental data will be explored to accomplish the calibration, recalibration, or validation of the proposed design method. Lastly, the study will finalize new design method for thin BCOA and ME design tool.

**WHAT IS OUR GOAL?**

The goal of this task is to propose a ME design method applicable to thin BCOA in Caltrans road network and develop recommendations and guidelines for the use of the proposed method. The proposed method may be a new method to be developed or, alternatively, an existing procedure. Field calibration will be required to improve reliability of BCOA performance prediction for Caltrans road network traffic, materials, pavement structures, and weather conditions.

**WHAT IS THE BENEFIT?**

Proposed ME design method will lead to a new pavement rehabilitation strategy and new design tool. The new design method and tool can be used to update standard, plans, and specifications. The study will also provide information (e.g., pavement performance, etc.) to the pavement management system.

**WHAT IS THE PROGRESS TO DATE?**

The researchers analyzed pros and cons of the different ME design options and decisions by Caltrans. Analysis of National Cooperative Highway Research Program (NCHRP) 01-61 data was completed and the draft report was prepared. Recalibration of Pavement ME was not recommended.

The proposal for catalog factorial was submitted to Caltrans. Around 2000 Pavement ME runs have been completed.