TRB Superpave Committee
Highlights of the 2001 Annual Report

The Transportation Equity Act for the 21st Century (TEA-21) restructured highway research funding and thrust the American Association of State Highway and Transportation Officials (AASHTO) into joint financing with the Federal Highway Administration (FHWA)of efforts to implement the Superpave design method. At the request of both organizations, in 1999 the Transportation Research Board (TRB) established the TRB Superpave Committee to review workplans of AASHTO and FHWA research, advise on objectives and tasks, identify missing components, suggest coordination of activities, and develop a long-range plan. Expert task groups (ETGs) for binders, mix and aggregate, and communications and training were formed to assist the Committee.

Now, three years later, indications are strong that the four-way partnership of AASHTO, FHWA, the asphalt paving industry, and TRB, is yielding major benefits. Superpave is becoming the national hot mix standard. The Superpave binder specification is now used in all but four states. Superpave mixes accounted for more than 53% of all the DOT tonnage produced in 2000, and are expected to approach 60% when final figures for 2001 are collected. A national survey shows that Superpave mixes are generally within $1/ metric ton of conventional hot mix prices.

The 'research' associated with Superpave deployment aims to improve the value and utility of Superpave to agencies and contractors. Through 2001, substantial progress has been made in meeting each of the four goals of the TRB Superpave Committee's long-range plan.

Goal 1 *Superpave will recommend binder type (including modified binders) and mixture proportions based on environmental and loading conditions and pavement design.*

The key to Superpave performance-based binder specification is that the physical properties required for the binders are the same for all grades but the temperature at which those properties must be attained should fit the specific climatic conditions at the paving location. Currently, the Superpave binder selection system accommodates virtually all unmodified binders and some modified binders. Changes to test equipment will be needed if the performance attributes of all asphalt modifiers are to be tested accurately. This research is now in progress through NCHRP 9–10, 90–04, and 90–07. The laboratories affiliated with the Binder ETG are helping to validate this work. The TRB Superpave Committee has recommended accelerated full-scale pavement testing to validate these improvements to binder testing. An FHWA pooled-fund solicitation is under way to obtain financial support for this project. This experiment could provide the final link in the binder specification.

Goal 2 *Superpave will predict the ability of a mix to withstand rutting, fatigue, thermal cracking, and moisture damage.*

A central feature of the Superpave system is the ability to test the asphalt mixture in the laboratory and predict its performance in high-traffic, high-load environments. The 2002 Pavement Design Guide (NCHRP 1–37A) now incorporates a

refined indirect tensile test and a recalibrated model for Superpave thermal cracking. This links pavement design and performance prediction to actual mix design values for low-temperature cracking properties. The need for simple performance tests for the Superpave volumetric mix design method is being addressed (NCHRP 9–19), test equipment is being developed, and a pooled-fund procurement of this new equipment is expected late in 2002 (NCHRP 9–29). Advanced prediction models for several distress modes in HMA pavements are being addressed in NCHRP 9–30 and 1–37A. At the suggestion of the Committee, fundamental mechanisms of moisture sensitivity (stripping) are being addressed through FHWA-managed research at the Western Research Institute in Laramie, Wyoming. NCHRP 9–34 will attempt to develop an improved physical test for mix design. In 2001, the Committee, based on the findings of NCHRP 9–14, determined that the much-debated 'restricted zone' was redundant if mixtures met all of the other Superpave design requirements.

Goal 3 *Superpave will integrate the binder and mix requirements into a performance-based construction quality control specification system*

The Committee believes that a mix design system with predictive capabilities is more valuable if the performance prediction is linked to construction specifications. Performance-related specification links key mix-design parameters to contractor-controlled test parameters, predicts the life of the as-built pavement, and adjusts the associated pay factors. Field trials to evaluate and refine the performance-related specifications are underway in NCHRP 9–22 and the performance models are being calibrated and validated. Correlating test equipment between agencies and contractors is key to the success of such a system. Under NCHRP 90–01, FHWA has developed a dynamic angle verification kit that correlates Superpave gyratory compactors even if they are from different manufacturers. This device will forestall potentially costly conflicts between agencies and their contractors.

Goal 4 *Superpave will be clearly understood by public and private sector engineers, technicians, and contractors through initial and continuing training and outreach programs.*

The Communications and Training ETG was formed this year to promote understanding of the Superpave mix design system. The ETG has recommended that three volumes—a technical guide, a complete history, and a primer—be developed as the basis for communication to audiences at all levels of involvement with Superpave. A plan to develop a nationally coordinated source of training programs and curricula with direct links to the most current information through partnership with AASHTO, FHWA, and industry, and to the expertise of the ETGs is also emerging. The AASHTO Subcommittee on Research has allocated funds to develop the ultimate Superpave communication and training product, a compendium of revised mix analysis methods, software, and manual (NCHRP–33). This work will probably begin in 2002.

Other issues remain to be addressed in the future. These include extension of Superpave to low-volume roads, and development and validation of advanced Superpave models.

The Committee's letter reports to its sponsors are on the Internet at www4.trb.org/trb/dive.nsf. Comments regarding the Committee's work may be directed to the Communications and Training ETG via email to lmason@nas.edu.