National
Cooperative
Highway
Research
Program

NCHRP SUPERPAVE RESEARCH

- **Since 1993, NCHRP has funded 14 research projects intended to *facilitate adoption* of the Superpave method, *enhance its features*, or *fill gaps* in the original SHRP asphalt research program.**
- **Total budget through FY 2001 (including "Saving SHRP"): $16.5 million.**

NCHRP SUPERPAVE RESEARCH "SAVING SHRP"

NCHRP FY 1999 -- $5,600,000 :

NCHRP	**$3,200,000**
FHWA	**$2,200,000**
TRB	**$ 200,000**

NCHRP FY 2000 -- $2,100,000 :

NCHRP	**$ 900,000**
FHWA	**$1,000,000**
TRB	**$ 200,000**

FY 2001 SUPERPAVE PROGRAM

(17.5% of Programmed Funds)

NCHRP	**$2,400,000**
FHWA	**$1,575,000**
TRB	**$ 200,000**
TOTAL	**$4,175,000**

NCHRP Superpave Research

9-9(1): *Verification of Gyration Levels in the N_{design} Table*

Verify through field project evaluations that the gyrations levels in the AASHTO TP4 N_{design} table are correct or modify as required.

NCAT (June 2002)

NCHRP Superpave Research

9-10: *Superpave Protocols for Modified Asphalt Binders*

- **Recommended update to AASHTO PP5.**
- **Suggested revisions to AASHTO MP1.**
- **Methods for storage stability, solid additive content, mixing & compaction temperatures.**

Asphalt Institute (December 2000)

NCHRP Superpave Research

9-12: ***Incorporation of Reclaimed Asphalt Pavement in the Superpave System***

Planned for publication in early 2001:

- ***Guidelines for Incorporating RAP in Superpave***
- ***Use of RAP in Superpave: Technicians' Manual***

NCSC - Purdue University (November 2000)

NCHRP Superpave Research

9-13: ***Evaluation of Moisture Sensitivity Tests***

- **Revised AASHTO T 283 test method compatible with the Superpave mix design method.**
- **NCHRP Research Report 444 in press.**

University of Nevada - Reno (Completed)

NCHRP Superpave Research

9-14: ***Investigation of the Restricted Zone in the Superpave Aggregate Gradation Specification***

Is conformance to the restricted zone needed when a mix design satisfies FAA and volumetric mix criteria?

NCAT (April 2001)

NCHRP Superpave Research

9-19: ***Superpave Support and Performance Models Management***

- Superpave 2.0 mix design software.
- Identify and validate simple performance tests for rutting and fatigue cracking.
- Advanced material characterization model and test.

University of Maryland (November 2002)

NCHRP Superpave Research

9-19: ***Superpave Support and Performance Models Management***

Candidate simple performance tests:

- dynamic modulus to measure E*/sin Ø.
- static creep to measure flow time.
- triaxial repeated load permanent deformation to measure flow number.

NCHRP FY 2001

9-19: ***Superpave Support and Performance Models Management***

Develop an advanced materials characterization model and test, verify them for a range of field mixes, and prepare a draft test method and equipment specification.

NCHRP Superpave Research

9-20: *Performance-Related Specification for Hot-Mix Asphalt Construction*

- **HMA PRS and software.**
- **Guide specification.**
- **WesTrack-derived Performance models.**

NATC and WesTrack Team (November 2000)

NCHRP Superpave Research

9-22: ***Beta-Testing and Validation of HMA PRS***

Evaluate the HMA PRS and software developed in a series of field trials, validate the performance models, and develop a training course curriculum and materials.

Fugro-BRE, Inc. (December 2003)

NCHRP Superpave Research

9-23: ***Environmental Effects in Pavement Mix and Structural Design Systems***

Validate the Integrated Climatic Model (ICM) with data from the full LTPP Seasonal Monitoring Program. ($350,000)

NCHRP SUPERPAVE PROGRAM

FY 2001

NCHRP FY 2001

9-25: ***Requirements for Voids in Mineral Aggregate for Superpave Mixtures***

Develop recommended criteria for VMA, VFA, or calculated binder film thickness to ensure adequate durability and resistance to permanent deformation and fatigue cracking. ($400,000)

NCHRP FY 2001

9-26: ***Precision Statement for AASHTO TP4***

Develop a precision statement for AASHTO TP4-00 and update the current statements for AASHTO T 166 and ASTM D2041-00. ($150,000)

NCHRP FY 2001

9-27: ***Relationships of HMA In-Place Air Voids, Lift Thickness, and Permeability***

Determine minimum HMA lift thicknesses and in-place density necessary to achieve an impermeable, durable pavement. ($350,000)

NCHRP FY 2001

9-29: ***Simple Performance Tester for Superpave Mix Design***

Design, procure, and evaluate simple performance testers for use in Superpave mix design and in HMA materials characterization for pavement structural design. ($250,000)

SUPERPAVE PERFORMANCE MODELS

Proposed Changes to the
Long-Range Plan for 2005

TRB Superpave Committee

- Superpave Support Staff
- Binder and Mix & Aggregate Expert Task Groups
- Superpave Development and Deployment: Long-Range Plan For Fiscal Year 2001-2005 -- (1) Mix, Binder, Aggregate; (2) Models; (3) PRS; (4) Training and Outreach

Superpave Mix Analysis Method - Alternate Strategy

- Adapt HMA performance models and integrated climatic model from the 2002 Design Guide (Project 1-37A) for mix analysis and, possibly, HMA PRS.
- Defer development of advanced models.
- Realistic completion date: 2004 or 2005.
- Savings, FY 2002 and beyond: $4-5 million.

Superpave Mix Analysis Method - Alternate Strategy

- Advantages:
  1. Common tools for mix design, structural design, and HMA PRS.
  2. Fewer materials characterization tests; reduced need for new equipment; simplified technician training.
  3. Future development of next generation of multi-use, mechanistic performance models proceeds with minimal duplication of effort.

Superpave Mix Analysis Method - Alternate Strategy

- Advantages:
  4. Implement sooner at lower cost.
- Disadvantages:
  1. Substantial time lost if Project 1-37A is not ultimately successful.
  2. Independent development of next generation of multi-use, mechanistic performance models may be significantly delayed.

AASHTO's Research Program Since 1962

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