ETF Research Update

Dec. 2023

NCHRP 9-62 Rapid Tests and Specifications for Construction of Asphalt-Treated Cold Recycled Pavements

Funds:	**$999,737**
Research Agency:	Virginia Transportation Research Council
Principal Investigator:	Brian Diefenderfer
Effective Date:	6/1/2017
Completion Date:	8/31/2022
Comments:	Publication pending

OBJECTIVE Develop:
(1) time-critical tests for asphalt-treated CIR, FDR, and CCPR materials and
(2) a guide specification using these tests for process control and product acceptance
that provides the agency with a basis for determining when the pavement can be opened to traffic and surfaced.

STATUS: Phase IV Publication pending. The final report for Phases I-III of the project is available as *NCHRP Research Report 960, Proposed AASHTO Practice and Tests for Process Control and Product Acceptance of Asphalt-Treated Cold Recycled Pavements*.

NCHRP 14-43 Construction Guide Specifications for Cold Central Plant Recycling and Cold In-Place Recycling

Funds:	**$250,000**
Research Agency:	National Center for Asphalt Technology
Principal Investigator:	Benjamin Bowers
Effective Date:	5/26/2020
Completion Date:	8/31/2022
Comments:	Report Published as NCHRP Web-Only-Document 363

OBJECTIVE

Produce proposed AASHTO Construction Guide Specifications for the application of CCPR and CIR in the standard five-part AASHTO format with supporting commentary. The specifications shall include plans for quality assurance and agree with current provisional material specifications and mix design practices for these treatments. The specifications shall enable specifying agencies to tailor their own specifications to the local conditions and environments.

STATUS: Project's Report Published as NCHRP Web-Only-Document 363 (https://www.trb.org/Publications/Blurbs/182965.aspx).

NCHRP 14-44 Construction Guide Specifications for Slurry Seals, Scrub Seals, and Tack Coats

Funds:	**$175,000**
Research Agency:	University of Arkansas
Principal Investigator:	Andrew Braham
Effective Date:	9/2/2020
Completion Date:	3/1/2022

OBJECTIVE: The objective of this research was to develop recommended guide specifications for the construction of slurry seals, scrub seals, and tack coats as used in preservation treatments.

STATUS : Research is complete. The research reviewed and evaluated the current practices for the construction of slurry seals, scrub seals, and tack coats and proposed (1) a set of proposed guide specifications for their construction and (2) a set of practices for quality assurance of their construction. The final deliverable includes 3 parts: Part !: Final Report, Part II: Proposed Guide Specifications for Construction of Slurry Seals, Scrub Seals, and Tack Coats, and Part III: Proposed Quality Assurance Guide. Parts II and III have been provided the AASHTO Committee on Materials and Pavements for consideration and possible incorporation into the AASHTO Guide Specifications for Highway Construction; they are not available. Part I is available at https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP14-44_Part-I_FinalReport.pdf

NCHRP 14-48 Construction Guide Specifications for Pavement Treatments - Sand Seals and Ultra-thin Bonded Surface Treatments

Funds:	**$175,000**
Staff Responsibility:	Dr. Amir Hanna
Research Agency:	University of Arkansas
Principal Investigator:	Andrew F. Braham
Effective Date:	10/10/2022
Completion Date:	4/9/2024

OBJECTIVE: The objective of this research is to develop recommended guidance for the construction of sand seals and UTBWCs as used in preservation treatments.

STATUS: Research in progress.

NCHRP 10-114 Developing Performance and Safety Specifications for Rejuvenating Seals

Funds:	**$300,000**
Staff Responsibility:	Camille Crichton-Sumners
Research Agency:	Auburn University
Principal Investigator:	Dr. Raquel Moraes
Effective Date:	8/4/2022
Completion Date:	8/4/2025
Comments:	Research in progress.

OBJECTIVES

The objectives of this project are to (1) provide the characteristics of the rejuvenator based on chemistry and rheology; (2) determine how different rejuvenating compounds are penetrating and rejuvenating the underlying pavement; (3) determine how the desired performance for a rejuvenating seal is measured and quantified in the laboratory and field; (4) determine the life extending benefit and impact on friction properties of a rejuvenating seal measured and quantified in the laboratory and field; (5) determine how practitioners may design an optimum dose and/or application rate for a rejuvenator required to provide the desired performance and friction properties; and (6) document suggested practice prepared in conformance with AASHTO standard format.

STATUS: Research in progress.

NCHRP 10-124 Development of Field Test to Determine Actual Percent Embedment of Chip Seal Aggregate

Funds:	**$400,000**
Contract Time:	36 months
Staff Responsibility:	Roberto Barcena
Comments:	Contract pending.

OBJECTIVE

The objective of this research is to identify, adapt, or develop a rapid field test method(s) to determine the percentage embedment depth of a uniformly placed chip seal of known aggregate gradation.

The term “rapid” for this project refers to a test method(s) that can be used as part of the quality control (QC) process, and can provide its results after the initial chip seal sweeping, allowing for real-time adjustments during the construction process.

STATUS: The contractor has been selected. Contract pending.

NCHRP Proect 20-05, Synthesis Topic 55-04
Current Practices and Guidelines for Full Depth Reclamation (FDR)

Funds:	**$60,000**
Contract Time:	12 months
Staff Responsibility:	Edward Harrigan
Comments:	In Progress

OBJECTIVE: Document current state DOT practices and guidelines for the use of FDR.

STATUS: Workplan submitted for approval.

NCHRP 10-134 [Anticipated] Performance-Based Tests for Asphalt Emulsion Treatments as part of Agency Acceptance and Incentive Programs

Funds:	**$400,000**
Staff Responsibility:	Amir N. Hanna
Comments:	In development
Fiscal Year:	2024

OBJECTIVE

This research would lead to the identification and/or development of various tests and specification limits related to the field performance of the selected asphalt emulsion-based treatments. In turn, this will allow DOTs to develop performance-related acceptance criteria in conjunction with their quality assurance (QA) programs. Furthermore, incentive/disincentive programs could be developed for use with the emulsion contracting community and could lead to even longer in-service life for these treatments.

NCHRP 20-44(26) Implementing Guide Specifications for the Construction of Chip Seals and Micro Surfacing.

Funds:	**$200,000**
Research Agency:	National Center for Pavement Preservation
Principal Investigator:	Bouzid Choubane
Effective Date:	9/24/2020
Completion Date:	9/25/2023
Comments:	Publication decision pending

OBJECTIVE

The primary objective of this undertaking is to bring awareness and facilitate a wider acceptance and use of these specifications by transportation agencies, both at the state and local levels. The related effort consisted of a series phased activities that included, outreach, in-person and web-based dissemination of information and training, as well as several in-service demonstration projects utilizing these newly adopted AASHTO Guide Specifications.

STATUS : Project complete

NCHRP 9-63 A Calibrated and Validated National Performance-Related Specification for Emulsified Asphalt Binder

Funds:	**$1,000,000**
Staff Responsibility:	Roberto Barcena
Research Agency:	The Asphalt Institute
Principal Investigator:	R. Michael Anderson
Effective Date:	5/1/2019
Completion Date:	3/20/2027
Comments:	Research in progress

OBJECTIVE

The objective of this research is to develop a national performance-related material specification for emulsified asphalt binder for use with chip seals and microsurfacing/slurry seals that (a) is similar in concept and format to AASHTO Standard Specifications M 320, Performance-Graded Asphalt Binder, and M 332, Performance-Graded Asphalt Binder Using Multiple Stress Creep Recovery (MSCR) Test; (b) is calibrated and validated with performance data from field test sections; (c) uses readily available testing equipment (i.e., Superpave test equipment); and (d) reflects varying climatic and traffic conditions.

STATUS: PHASE 1 Complete ; PHASE 2 Ongoing

Submitted for FY25

Pavement Marking Selection for Bridge and Pavement Preservation Treatments

Funds:	**$400,000**
Staff Responsibility:	Unknown
Comments:	In development
Fiscal Year:	3 years proposed

OBJECTIVE

The objective of this research is to determine the optimal pavement marking type for each bridge and pavement preservation treatment type, traffic volume, and if applicable anti-icing and deicing strategies. Identify the compatibility of the markings and treatment types, the needed film thickness of marking, the optimal retroreflective media, and the expected durability of the marking selected.

Submitted for FY25

Sampling from Micro Surfacing and Slurry Seal Pavers for Quality Assurance Testing

Funds:	**$300,000**
Staff Responsibility:	Unknown
Comments:	In development
Fiscal Year:	30 months proposed

OBJECTIVE

This proposed research seeks to develop a strong sampling method or technique(s) to safely obtain a completed mixture micro surfacing and slurry seal (slurry surfacing) that is representative of the mixture behind the spreader box that is repeatable, reproducible, and captures enough material to conduct testing on the asphalt binder content and gradation of the aggregate. Furthermore, the method(s) developed should include suggested sampling vessels that do not retain excess material that may confound the testing and provide a stable means of transporting the sample to a laboratory for quality assurance testing.

Submitted for FY25

Developing Asphalt Emulsion Based High Friction Surface Treatments (HFST)

Funds:	**$450,000**
Staff Responsibility:	Unknown
Comments:	In development
Fiscal Year:	3 years proposed

OBJECTIVE

Evaluate the feasibility of asphalt emulsion-based HFST. Key questions to answer are:

- Does asphalt emulsion have equal or better aggregate retention versus polymer binder?
- Does asphalt emulsion-based HFST have equal or better skid resistance in the lab versus polymer binder?
- Does asphalt emulsion-based HFST have equal or better performance in the field?
- Does asphalt emulsion-based HFST have equal or lower life-cycle cost versus polymer binder?

If research supports:

- Develop asphalt emulsion-based HSFT guidance, based on polymer binder HSFT treatments