

“This successful program has shown us that we can have confidence that preservation treatments such as fog seal and ultrathin asphalt overlay (4.75 mm) do work on high-traffic-volume roadways in the short term. We can apply this knowledge as we continue to advance, develop, and refine our preservation activities and keep our roadways in better shape using the most cost-effective techniques.”

—BINH H. BUI
RESEARCH IMPLEMENTATION MANAGER, GEORGIA
DEPARTMENT OF TRANSPORTATION



Photo courtesy PennDOT



Workshop in Alabama.
Photo courtesy Stephen J. Cooper

“The guidelines provide a means of looking at preservation options to reconsider for high-volume roads because times have changed, the economy has changed, and the applications may be quite different now.”

—RICHARD MILLER,
KANSAS DEPARTMENT OF TRANSPORTATION



SHRP2 Solutions

Preserving High-Traffic Roadways

Photo courtesy Kentucky DOT

What the Guidelines Contain

Preservation Analysis Tool and Instructions

Four modules enable the user to identify the right project and the right technique for the conditions of the project.

- ▶ Application Pavement
- ▶ Performance Measures
- ▶ Treatment Toolkit Setup and Management Project Analysis
- ▶ Resources



Data Collection Guide

The guide helps agencies identify the data needed for a number of decisions and analyses, including the following:

- ▶ Evaluating the suitability of roadway projects for pavement preservation and the feasibility of different treatments for a selected project
- ▶ Designing the selected project to accommodate a selected treatment and constructing the treatment according to specifications
- ▶ Monitoring the performance of the constructed treatment and evaluating its cost-effectiveness in a high-traffic-volume scenario

Other Guidance Documents to help agencies address:

- ▶ Factors to look for in selecting project and treatment selections
- ▶ Examples of scenarios for identifying feasible treatments

Pavement Preservation Solutions in Action

▶ **West Virginia:** Following its pilot project, West Virginia Department of Highways (WVDOT) is developing new specifications to expand the use of a variety of preservation techniques. In places where formerly only hot-mix asphalt might be specified, WVDOT is adding options such as cape seals or microsurfacing.

“This is helping us advance the processes and select the treatments that best suit the individual site.”

—TRAVIS WALBECK,
WVDOT STATE PAVEMENT ENGINEER

▶ **Kentucky:** Facing sharply rising asphalt prices, the Kentucky Transportation Cabinet (KYTC) is using the guidelines to broaden its use of pavement preservation, help them keep good roads in good condition longer, and “catch more miles for less money.” Using the guidelines, KYTC built a small-scale “test track” with separate treatments in 1,500-foot segments on a four-lane rural arterial with average daily traffic of 12,800 vehicles. By monitoring the roadway for rutting, cracking, raveling, pitting, and International Roughness Index (IRI), KYTC officials can identify the best treatments that work for certain conditions. KYTC also uses the site for training its staff and local governments, as well as executive leadership.

“This gives us a strong foundation on which to build a solid preservation program.”

—TRACY NOWACZYK,
DIRECTOR OF THE KYTC
DIVISION OF MAINTENANCE

▶ **Rhode Island:** The Rhode Island Department of Transportation (RIDOT) already has considerable experience using preservation on its high-volume roads; however, it is using the guidelines to broaden the range of successful treatments being used. RIDOT is testing a stress-absorbing membrane interlayer (SAMI) chip seal on a five-lane rural collector with average daily traffic of 16,200 vehicles, including 2.8 percent truck traffic. The goal is to broaden the preservation options beyond the “usual suspects.”

Your guide to the best options for extending pavement life and reducing life-cycle costs

The Challenge — Knowing when, what, and how to apply smart preservation techniques for slowing pavement deterioration

Stretching the time between major rehabilitation projects can save transportation agencies money, reduce congestion, and improve safety. For years, the life of lower-volume roadways has been extended by applying pavement preservation techniques. Achieving the same results on high-traffic roadways requires a systematic approach that considers a variety of road conditions and proper timing of treatments to reduce traffic impacts.

The Solution — Strategies and techniques to make the right decision at the right time

Guidelines for the Preservation of High-Traffic-Volume Roadways (R26) offers easily accessible information and tools that will help transportation agencies determine the right preservation techniques that will extend the life of high-traffic roadways without major reconstruction and traffic disruption. Developed through the second Strategic Highway Research Program (SHRP2), the *Guidelines* are aimed at those involved in asset management, pavement design and engineering, pavement management, and maintenance.

Included is the publication, *Guidelines for the Preservation of High-Traffic-Volume Roadways*, which includes a selection process and matrices that enable quick identification of treatment options based on key considerations, such as type of road, climate zones, work zone duration restrictions, traffic volumes, and relative costs.

The *Data Collection Guide* helps agencies identify the data needed to evaluate the performance and benefits of their pavement preservation treatments while improving their implementation processes.

The *Preservation Analysis Tool* identifies feasible pavement preservation projects and enables the selection of the preferred treatment based on the conditions and characteristics of the project, the cost effectiveness of the treatment, and other selection factors.



Photos courtesy: Moba Corporation; MnDOT, David Peshkin, CH2M HILL

Just-In-Time Training

Just-In-Time Training Modules will address 19 topics from pavement preservation 101 to very specific details on the types of treatments available for high-traffic-volume roadways. The modules will include project and treatment selection options, will be accessible online, and will be available for on-demand viewing in the field.



For more information, contact Thomas Van, FHWA, thomas.van@dot.gov; Kate Kurgan, AASHTO, kkurgan@aaashto.org; and Pam Hutton, AASHTO, phutton@aaashto.org.

Links to all these products, as well as to case studies, presentations, and webinar recordings, are available at: http://shrp2.transportation.org/Pages/R26_HighTrafficVolRoadways.aspx

Photo courtesy PennDOT



Extending the life of the nation's busiest roads

The *Guidelines for the Preservation of High-Traffic-Volume Roadways* help transportation agencies save lives, money, and time.



Saving Money

Applying the right pavement preservation techniques to a broad range of high-traffic roads helps agencies stretch transportation



Saving Lives

Extending the life of pavement reduces the frequency of major

reconstruction projects. Fewer reconstruction projects reduce the risk and frequency of work-zone crashes.

dollars by reducing the frequency of major rehabilitation projects.

Saving Time

The proven preservation strategies reduce lane closures and congestion that come with lengthy rehabilitation and reconstruction projects, saving time for the traveling public.



A Vital Resource for Informed Decisions

Transportation departments in 15 states and the District of Columbia are testing, implementing, and sharing their options for extending the life of heavily traveled roads using the *Guidelines for the Preservation of High-Traffic-Volume Roadways*. Collectively, dozens of different preservation treatments are being tested on more than 30 roads with average daily traffic (ADT) ranging from 5,000 to more than 50,000 vehicles. The guidelines:

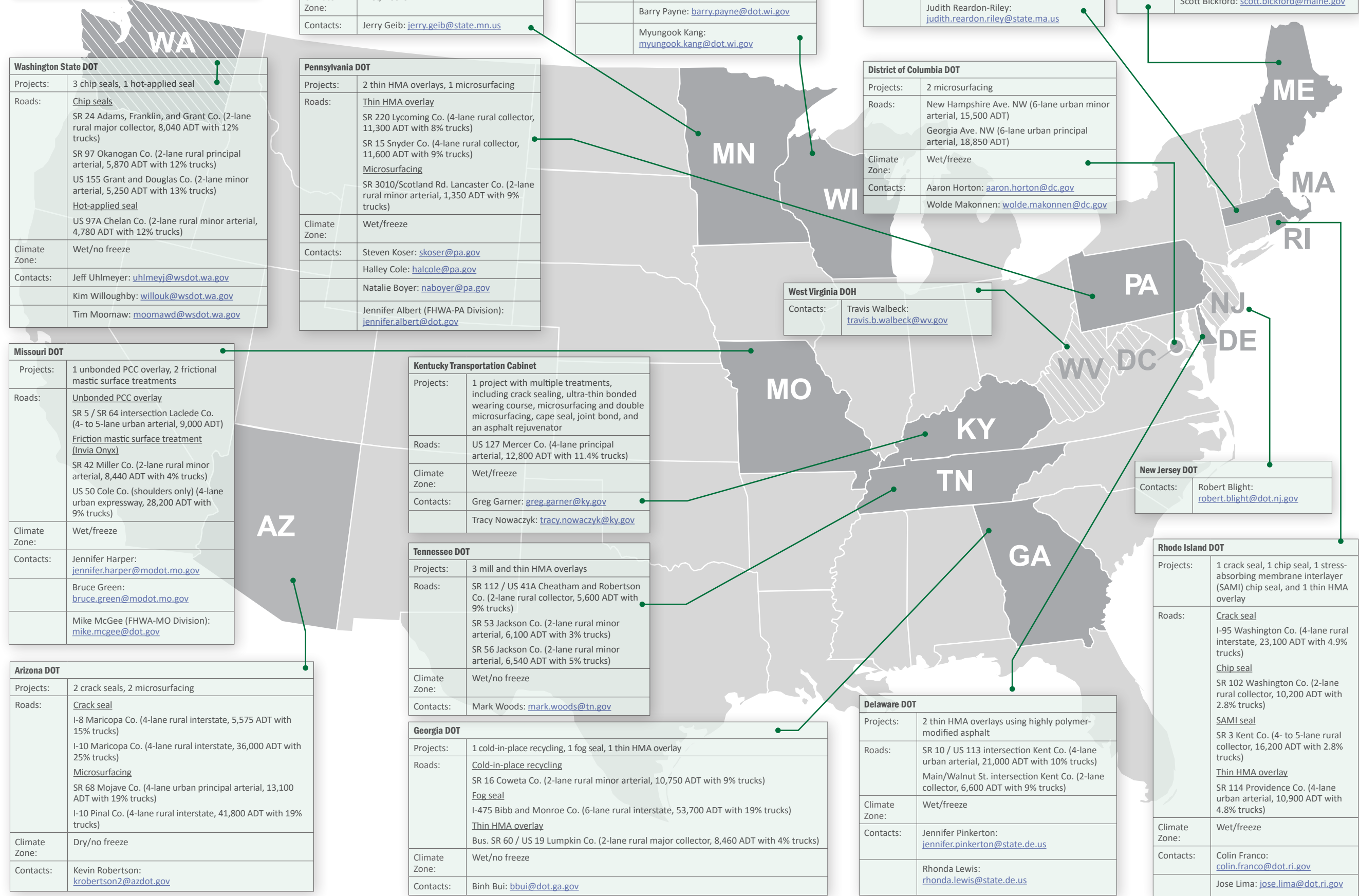
- Provide a portfolio of vital information on more than 20 treatments that have proven cost-effective.
- Consider diverse environmental and traffic conditions.
- Consolidate useful information in one place to save time on research and cost comparisons.
- Help engineers move quickly and confidently to select the right treatments at the right time.
- Make it easier to invest in preservation strategies on high-volume roads based on information that is tried and tested.
- Are useful to states with considerable experience in pavement preservation that are eager for new approaches to use on their higher-traffic roads as well as those states that are new to pavement preservation.

“The long-term financial impact of investing in pavement preservation is very exciting. The guidelines provide useful information that motivated the state to move toward newer approaches to extend the life of our roads.”

—GREG GARNER, KENTUCKY TRANSPORTATION CABINET.

The Guidelines are Being Used on Projects Across the Country

Legend These states are using their implementation assistance to address internal processes and training, and to further their pavement preservation programs.



Washington State DOT

Projects:	3 chip seals, 1 hot-applied seal
Roads:	<u>Chip seals</u> SR 24 Adams, Franklin, and Grant Co. (2-lane rural major collector, 8,040 ADT with 12% trucks) SR 97 Okanogan Co. (2-lane rural principal arterial, 5,870 ADT with 12% trucks) US 155 Grant and Douglas Co. (2-lane minor arterial, 5,250 ADT with 13% trucks) <u>Hot-applied seal</u> US 97A Chelan Co. (2-lane rural minor arterial, 4,780 ADT with 12% trucks)
Climate Zone:	Wet/no freeze
Contacts:	Jeff Uhlmeier: uhlmeij@wsdot.wa.gov Kim Willoughby: willouk@wsdot.wa.gov Tim Moomaw: moomawd@wsdot.wa.gov

Pennsylvania DOT

Projects:	2 thin HMA overlays, 1 microsurfacing
Roads:	<u>Thin HMA overlay</u> SR 220 Lycoming Co. (4-lane rural collector, 11,300 ADT with 8% trucks) SR 15 Snyder Co. (4-lane rural collector, 11,600 ADT with 9% trucks) <u>Microsurfacing</u> SR 3010/Scotland Rd. Lancaster Co. (2-lane rural minor arterial, 1,350 ADT with 9% trucks)
Climate Zone:	Wet/freeze
Contacts:	Steven Koser: skoser@pa.gov Halley Cole: halcole@pa.gov Natalie Boyer: naboyer@pa.gov Jennifer Albert (FHWA-PA Division): jennifer.albert@dot.gov

Missouri DOT

Projects:	1 unbonded PCC overlay, 2 frictional mastic surface treatments
Roads:	<u>Unbonded PCC overlay</u> SR 5 / SR 64 intersection Laclede Co. (4- to 5-lane urban arterial, 9,000 ADT) <u>Friction mastic surface treatment (Invia Onyx)</u> SR 42 Miller Co. (2-lane rural minor arterial, 8,440 ADT with 4% trucks) US 50 Cole Co. (shoulders only) (4-lane urban expressway, 28,200 ADT with 9% trucks)
Climate Zone:	Wet/freeze
Contacts:	Jennifer Harper: jennifer.harper@modot.mo.gov Bruce Green: bruce.green@modot.mo.gov Mike McGee (FHWA-MO Division): mike.mcgee@dot.gov

Kentucky Transportation Cabinet

Projects:	1 project with multiple treatments, including crack sealing, ultra-thin bonded wearing course, microsurfacing and double microsurfacing, cape seal, joint bond, and an asphalt rejuvenator
Roads:	US 127 Mercer Co. (4-lane principal arterial, 12,800 ADT with 11.4% trucks)
Climate Zone:	Wet/freeze
Contacts:	Greg Garner: greg.garner@ky.gov Tracy Nowaczyk: tracy.nowaczyk@ky.gov

Tennessee DOT

Projects:	3 mill and thin HMA overlays
Roads:	SR 112 / US 41A Cheatham and Robertson Co. (2-lane rural collector, 5,600 ADT with 9% trucks) SR 53 Jackson Co. (2-lane rural minor arterial, 6,100 ADT with 3% trucks) SR 56 Jackson Co. (2-lane rural minor arterial, 6,540 ADT with 5% trucks)
Climate Zone:	Wet/no freeze
Contacts:	Mark Woods: mark.woods@tn.gov

Arizona DOT

Projects:	2 crack seals, 2 microsurfacing
Roads:	<u>Crack seal</u> I-8 Maricopa Co. (4-lane rural interstate, 5,575 ADT with 15% trucks) I-10 Maricopa Co. (4-lane rural interstate, 36,000 ADT with 25% trucks) <u>Microsurfacing</u> SR 68 Mojave Co. (4-lane urban principal arterial, 13,100 ADT with 19% trucks) I-10 Pinal Co. (4-lane rural interstate, 41,800 ADT with 19% trucks)
Climate Zone:	Dry/no freeze
Contacts:	Kevin Robertson: krobertson2@azdot.gov

Georgia DOT

Projects:	1 cold-in-place recycling, 1 fog seal, 1 thin HMA overlay
Roads:	<u>Cold-in-place recycling</u> SR 16 Coweta Co. (2-lane rural minor arterial, 10,750 ADT with 9% trucks) <u>Fog seal</u> I-475 Bibb and Monroe Co. (6-lane rural interstate, 53,700 ADT with 19% trucks) <u>Thin HMA overlay</u> Bus. SR 60 / US 19 Lumpkin Co. (2-lane rural major collector, 8,460 ADT with 4% trucks)
Climate Zone:	Wet/no freeze
Contacts:	Binh Bui: bbui@dot.ga.gov

District of Columbia DOT

Projects:	2 microsurfacing
Roads:	New Hampshire Ave. NW (6-lane urban minor arterial, 15,500 ADT) Georgia Ave. NW (6-lane urban principal arterial, 18,850 ADT)
Climate Zone:	Wet/freeze
Contacts:	Aaron Horton: aaron.horton@dc.gov Wolde Makonnen: wolde.makonnen@dc.gov

West Virginia DOH

Contacts:	Travis Walbeck: travis.b.walbeck@wv.gov
-----------	--------------------------------------------------------------------------------------

Delaware DOT

Projects:	2 thin HMA overlays using highly polymer-modified asphalt
Roads:	SR 10 / US 113 intersection Kent Co. (4-lane urban arterial, 21,000 ADT with 10% trucks) Main/Walnut St. intersection Kent Co. (2-lane collector, 6,600 ADT with 9% trucks)
Climate Zone:	Wet/freeze
Contacts:	Jennifer Pinkerton: jennifer.pinkerton@state.de.us Rhonda Lewis: rhonda.lewis@state.de.us

New Jersey DOT

Contacts:	Robert Blight: robert.blight@dot.nj.gov
-----------	---------------------------------------------------------------------------------------

Rhode Island DOT

Projects:	1 crack seal, 1 chip seal, 1 stress-absorbing membrane interlayer (SAMI) chip seal, and 1 thin HMA overlay
Roads:	<u>Crack seal</u> I-95 Washington Co. (4-lane rural interstate, 23,100 ADT with 4.9% trucks) <u>Chip seal</u> SR 102 Washington Co. (2-lane rural collector, 10,200 ADT with 2.8% trucks) <u>SAMI seal</u> SR 3 Kent Co. (4- to 5-lane rural collector, 16,200 ADT with 2.8% trucks) <u>Thin HMA overlay</u> SR 114 Providence Co. (4-lane urban arterial, 10,900 ADT with 4.8% trucks)
Climate Zone:	Wet/freeze
Contacts:	Colin Franco: colin.franco@dot.ri.gov Jose Lima: jose.lima@dot.ri.gov

Minnesota DOT

Projects:	Sponsorship of national workshop highlighting preservation treatments constructed in previous years at the MnRoad facility, including microsurfacing, high polymer microsurfacing, ultra-thin bonded wearing course, thin bonded and unbonded concrete overlays, and chip seals
Roads:	I-94 Wright Co. (4-lane rural interstate, 26,500 ADT with 12% trucks)
Climate Zone:	Wet/freeze
Contacts:	Jerry Geib: jerry.geib@state.mn.us

Wisconsin DOT

Projects:	1 mill and thin HMA overlay
Roads:	US 51 Oneida Co. (4-lane urban primary arterial, 19,000 ADT with 7.3% trucks)
Climate Zone:	Wet/freeze
Contacts:	Jed Peters: jed.peters@dot.wi.gov Steve Krebs: steven.krebs@dot.wi.gov Peter Kemp: peter.kemp@dot.wi.gov Barry Payne: barry.payne@dot.wi.gov Myungook Kang: myungook.kang@dot.wi.gov

Massachusetts DOT

Projects:	1 project with multiple treatments using ultra-thin bonded wearing course and fog seal
Roads:	US 3 Middlesex Co. (6- to 8-lane urban principal arterial, 94,100 to 108,500 ADT with 5% trucks)
Climate Zone:	Wet/freeze
Contacts:	Ed Naras: edmund.naras@state.ma.us Judith Reardon-Riley: judith.reardon.riley@state.ma.us

Maine DOT

Projects:	1 project with multiple treatments using thin HMA overlay
Roads:	US 202 Lebanon and Sanford Co. (2-lane rural principal arterial, 11,210 ADT with 8% trucks)
Climate Zone:	Wet/freeze
Contacts:	Brian Luce: brian.luce@maine.gov Scott Bickford: scott.bickford@maine.gov