



Preservation Guidelines for High-Traffic-Volume Roadways

Annual Report: Project Inception through December 2015

I. *Overview of Guidelines for the Preservation of High-Traffic-Volume Roadways (R26)*

Many conventional preservation techniques--and some new ones—can be used to extend the life of high-traffic roadways without major reconstruction and traffic disruption. A new guide developed through the second Strategic Highway Research Program (SHRP2) offers the technical background and decision-making framework needed to bring preservation strategies widely into play for high-traffic roads.

Guidelines for the Preservation of High-Traffic-Volume Roadways, (R26), and its companion report, *Preservation Approaches for High-Traffic-Volume Roadways*, are the first systematic and comprehensive resources designed to expand the use of pavement preservation on high-traffic roads. They bring a systematic approach that considers a variety of road conditions and proper timing of treatments to control risk and reduce traffic impacts. The guidance is based on the findings from an extensive survey of 40 state highway agencies, seven Canadian provinces, and three cities, as well as a review of existing successful preservation techniques. The *Guidelines* include a selection process and matrices that enable quick identification of treatment options by various categories, such as rural or urban roads, climate zones, work zone duration restrictions, traffic volumes, and relative costs.

In 2013, 14 state highway agencies were selected to participate in Round 1 of the jointly administered Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO) Implementation Assistance Program (IAP), receiving financial and technical assistance to implement the concepts of the *Guidelines* on selected highway test projects.

The IAP states include: (as Lead Adopters) Arizona, Delaware, District of Columbia, Georgia, Kentucky, Massachusetts, Minnesota, Missouri, Pennsylvania, Rhode Island, and Washington; (as User Incentives) Maine, Tennessee, and Wisconsin.

II. Specific Implementation Activities

Technical Assistance

Implementation assistance for the R26 *Guidelines* is proceeding along two primary paths: providing funding and technical assistance to implementing state highway agencies and promoting outreach and technical support for preservation on high-traffic-volume roadways. As noted above, 14 agencies received implementation assistance funding in Round 1; 13 constructed or are in the process of constructing pavement sections, and one held a national workshop and showcase of its preservation practices on high-volume roadways. Table 1 summarizes the status of those agencies that received implementation funding as of the end of 2015.

A teleconference for agencies receiving implementation assistance is held during every quarter. Nine such teleconferences have been conducted to date, and in each of these meetings the progress of preservation projects is discussed, along with the details of each project and the need for any technical assistance with project implementation. Other items, such as outreach and tool development activities (as described below), are also reviewed.

Table 1. Status of agencies' R26 implementation initiatives

Agency	Preservation Treatment Summary	Construction Status
Arizona	Crack seal (2 projects) Microsurfacing (2 projects)	All projects completed in 2014
Delaware	Thin HMA overlay (2 projects)	Both projects scheduled for 2016
Washington, DC	Microsurfacing (2 projects)	Both projects scheduled for 2016
Georgia	Cold in-place recycling (1 project) Mill-and-thin HMA overlay (1 project) Fog seal (1 project with multiple test sections)	Two projects completed in 2014 Cold in-place recycling project scheduled possibly for 2016
Kentucky	1 project with test sections for following treatments: <ul style="list-style-type: none"> • Crack seal • Ultrathin bonded wearing course • Microsurfacing • Double microsurfacing • Cape seal • Joint bond • Rejuvenator • Fog seal 	Project completed in 2014
Maine	Hot in-place recycling with thin HMA overlay (1 project) Thin HMA overlay (1 project)	Both projects completed in 2014
Massachusetts	1 project with test sections for following treatments: <ul style="list-style-type: none"> • Ultrathin bonded wearing course with conventional asphalt binder • Ultrathin bonded wearing course with polymer-modified asphalt binder • Ultrathin bonded wearing course with crumb rubber-modified asphalt binder • Rejuvenator fog seals • Polymer-modified fog seals 	Project completed in 2015

Minnesota	Showcase of: <ul style="list-style-type: none"> • Microsurfacing • Chip seal 	Event held in 2014
Missouri	Unbonded PCC inlay (1 project) Onyx Seal surface treatment (2 projects)	One project completed in 2014 Other two completed in 2015
Pennsylvania	1 project with test sections for following treatments: <ul style="list-style-type: none"> • Thin HMA overlay with Kevlar Forta Fi® fibers • Thin HMA overlay without fibers Microsurfacing (1 project) Thin HMA overlay using rubber gap-graded mix (1 project)	All projects completed in 2013
Rhode Island	Crack sealing (1 project) Rubberized chip seal (1 project) SAMI seal (1 project) Mill-and-thin HMA overlay (1 project)	All projects completed in 2014.
Tennessee	Mill-and-thin HMA overlay (3 projects)	One project completed in 2013 Other projects completed in 2014
Washington	Chip seal (3 projects) Hot-applied chip seal (1 project)	All projects completed in 2014
Wisconsin	Mill-and-thin HMA overlay with fibers	Project completed in 2013.

Workshops, Showcases, Peer Exchanges, and Meetings

Outreach is proceeding through two separate but overlapping funding mechanisms: directly funded by the Federal Highway Administration (FHWA) and through a joint FHWA-AASHTO initiative. Outreach activities include workshops, showcases, and peer exchanges. Each of these activities is briefly described in the following summaries. The identified completed activities represent those carried out under both funding mechanisms.

Four-hour **workshops** are presented regionally to provide an introduction to the R26 research and the implementation efforts; demonstrate how R26 decision tools can be used in a pavement preservation program; and discuss implementation of preservation practices on high-volume roadways. The following workshops have been completed:

- Auburn, Alabama on June 24, 2014 (28 participants). This workshop included a site visit to the National Center for Asphalt Technology’s pavement preservation test sections on Lee Road 159.
- Phoenix, Arizona on October 8, 2014, in conjunction with the Rocky Mountain West Pavement Preservation Partnership (38 participants)
- Wilmington, Delaware on April, 28, 2015 in conjunction with the New England Pavement Preservation Partnership (28 participants)

As noted in Table 1, rather than place preservation treatments Minnesota DOT hosted a **workshop on preservation**. In September 2014, more than 160 participants from across the United States attended this two-day event, which included presentations and panel discussions, and included representatives from agencies, academia, contractors, and the consulting industry. The highlight of this event was a site visit to MnROAD, where participants were able to

see firsthand MnDOT's installations of a chip seal, microsurfacing, thin overlay, and diamond grinding on pavements carrying more than 25,000 vehicles daily.

Daylong **showcases** are an opportunity to introduce technologies, treatments, construction practices, and other field aspects of pavement preservation to an interested audience. The showcases are intended to be held in conjunction with the construction of the implementation projects. One showcase was held in Burlington, Massachusetts on July 23, 2015; 68 people participated. In addition to a site visit to Massachusetts' testing sites (see Table 1) during ongoing construction, the showcase included presentations from contractors, the DOT, and research leads.

Peer exchanges bring together representatives from state highway agencies to participate in discussions on the successes, challenges, and strategies surrounding the use of preservation on high traffic volume roadways. One peer exchange was held in Warwick, Rhode Island from December 3-4, 2014, with 17 participants. These participants shared experiences on the following topics: project selection, design/contracting, construction, quality management, performance, and program issues. RIDOT also coordinated a visit to each of its high-traffic test sections.

User Group conference calls have been held on a quarterly basis since 2013 with representatives from most of the States participating in the Round 1 program. These calls are structured to share experiences between the agencies on the progress of the projects, tracking outcomes and discussing challenges to establishing the programs in each States. In some calls additional States have participated with much interest in moving their preservation programs forward.

Marketing and Communications Activities

The R26 *Guidelines* product was one of the first SHRP2 Solutions to be implemented. Since then, a number of marketing and communications tools have been developed and are being used by the states and the subject matter experts. They have also been highlighted at key AASHTO meetings and committees, and at regional meetings of state DOTs. They include:

- A marketing plan that included appropriate messaging, suggested techniques, and target audiences that became the basis of the other marketing activities.
- Tri-fold brochure, *Preserving High-Traffic Roadways*, outlining the product and its benefits, with a map showing each IAP state and activity (http://shrp2.transportation.org/documents/renewal/SHRP2_R26_Pavement_Brochure_VIEW_508.pdf)
- Promotional [video](#) highlighting the key elements of the product
- Web page on the AASHTO SHRP2 website (http://shrp2.transportation.org/Pages/R26_HighTrafficVolRoadways.aspx)
- Poster used at meetings and conferences with map of IAP states and their projects
- [Article](#) in the *AASHTO Journal* highlighting the Minnesota DOT showcase
- Numerous presentations

Other Activities

During 2015, it became known that additional implementation assistance for the R26 *Guidelines* product might be made available in the Round 7 of the IAP. A one-day **Implementation Planning Workshop** was held in Lakewood, Colorado on August 18, 2015, to explore potential objectives and strategies should additional implementation assistance be made available. The workshop was attended by representatives from eight SHAs (Colorado, Pennsylvania, Nevada, New Jersey, North Dakota, Rhode Island, and Texas), as well as representatives from FHWA, AASHTO, Applied Pavement Technology, and CH2M. FHWA used the discussions to formulate their approach to the Round 7 IAP support.

One new tool was developed to enhance the *Guidelines'* implementation. [Data Collection Guidelines for Implementing Pavement Preservation Projects](#), assists states in 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; and monitoring the performance of the constructed treatment and evaluating its cost-effectiveness in a high-traffic-volume scenario.

In addition, a framework for a pocket or field guide was developed and provided to FHWA; but no further action has been taken.

Finally, case studies have been developed for three of the implementing agencies: Kentucky, Washington, and Rhode Island. These are provided as an appendix to this report and highlights are noted below. Each case study describes the agency's interest in implementing a particular preservation treatment (i.e., product) and discusses the approach taken to implement and evaluate the benefits of the treatment. Lessons learned and impacts on practice are also reported.

III. Outcomes

Several IAP states have embraced the guidance and principles behind the R26 *Guidelines* since implementation began in 2014. A brief summary is provided below; more information is included in the case studies as noted above.

Washington State Department of Transportation

Washington State DOT has gained confidence in the use of hot-applied chip seals for higher-volume roads. The use of this treatment shortened construction time over conventional chip seals and allowed them to return the road to service more quickly. As a result of the test section, the agency has expanded the ADT eligibility for chip seals and are continuing to apply these chip seals to high-volume roads. This has resulted in reduced spending on rehabilitation and increased spending on strategic pavement preservation.

Rhode Island Department of Transportation

RIDOT was encouraged by the *Guidelines* to stretch their existing practices to apply treatments that already worked for them on higher-volume roadways. RIDOT was reassured when they saw that national guidance and guidelines very closely mirrored their practices.

Kentucky Transportation Cabinet

KYTC constructed test sections consisting of eight different treatments with the objective of learning how they performed and identifying their life-extending benefits. The agency has also incorporated the R26 *Guidelines* into its internal preservation policy.

IV. Expected or Actual Benefits Accrued from Implementing R26 Guidelines

A number of benefits have already been identified by states implementing the R26 *Guidelines*, particularly as they relate to internal process or program changes. Actual pavement assessments are ongoing and have continued since installation in 2013 and 2014, with limited findings at this time. In keeping with the goal of extending pavement life, however, anticipated results are not expected to emerge until several years of monitoring are completed.

Here are some of the program changes that have occurred since implementation:

Washington State DOT

The DOT estimates it can extend its pavement life cycles at least two years by using strategic preservation activities. The agency has now engaged a committee to help establish new statewide priorities. The agency is also adopting the use of chip seals for pavement surfaces carrying up to 10,000 vehicles per day as a standard practice, saving \$29 million per year.

Rhode Island DOT

The use of R26 *Guidelines* encouraged innovation and progressive practices based on the experiences of other agencies. The agency is now seeing greater use of preservation products and high-volume road preservation practices.

Kentucky Transportation Cabinet

By placing the treatments on strategic roadways, the use of the *Guidelines* has resulted in building confidence in the treatments themselves. The agency also is gaining knowledge and experience as it develops a plan to monitor performance. In developing the implementation project, an agency-wide preservation alliance has improved internal communication.

V. Next Steps

2016 will see continued outreach efforts, focusing on workshops and peer exchanges. A peer exchange sponsored by the Pennsylvania Department of Transportation will be conducted tentatively 29-30 July, 2016, in Williamsport. The host agency will have some technical

presentations on the agency's test sections and a site visit will be held to see the projects. A peer exchange in St. Louis, MO, is also tentatively being scheduled for the August 2016 time period.

The Round 7 Implementation Assistance Program has been designed to add a number of new participating agencies, bringing implementation even closer to the "critical mass" of adopting agencies. The development of a tool to help apply the project *Guidelines* is also expected.

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