

# Pavement Preservation: How



## EDC Implementation Plan

Every Day Counts | Innovation Initiative

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## Section I: Overview and Innovation Description

### A. Background

Pavement preservation is work that is planned and performed to improve or sustain the condition of a transportation facility in a state of good repair. Preservation activities generally do not add capacity or structural value, but do restore the overall condition of the transportation facility. Incorporating pavement preservation into an overall practice of managing a pavement network is a cost-effective way to extend pavement life, enhance safety, increase customer satisfaction, and improve pavement performance. Using quality construction practices and materials is vital to achieving these goals and preserving pavements in a state of good repair.

This EDC4 innovation is focused on improvements in construction practices and materials selection for the preservation of flexible and rigid pavements. In particular, advancements in construction practices and material selection have led to improved performance of the following preservation treatments:<sup>1</sup>

#### Asphalt-Surfaced Pavements

Microsurfacing

Chip seal

Slurry seal/Scrub seal

Ultrathin bonded wearing course

#### Concrete-Surfaced Pavements

Diamond grinding

Partial-depth repair

Full-depth repair (fast)

Dowel bar retrofit/Cross stitching

The following are brief descriptions of these treatments.

### MICROSURFACING

Microsurfacing is a mixture of crushed, well-graded aggregate, mineral filler (portland cement or sometimes aluminum sulfate), and polymer-modified

#### **Pavement Preservation “How”**

Focuses on pavement preservation treatment practices associated with:

- ✓ Quality construction
- ✓ Quality materials

The goal is extending the concept of “right treatment on the right pavement at the right time” so that it includes treatments that are constructed the right way.

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<sup>1</sup> Many additional treatments are successfully used for pavement preservation. Available resources to learn more about these treatments include the *Concrete Pavement Preservation Guide*, Second Edition (Smith, Harrington, et al. 2014) and *Guidelines for the Preservation of High-Traffic-Volume Roadways* (Peshkin, Smith, et al. 2011).

asphalt emulsion spread over the full width of pavement with either a squeegee or spreader box. Microsurfacing is used primarily to inhibit raveling and oxidation, and is also effective at improving surface friction and filling minor irregularities and rutting (up to 1.5 in. deep) (Peshkin et al 2011).

### **CHIP SEAL**

Chip seals are a sprayed application of asphalt (commonly an emulsion, although heated asphalt cement, rubberized asphalt, and cutbacks are also used) directly to the pavement surface (0.35 to 0.50 gal/yd<sup>2</sup>), followed by application of aggregate chips (15 to 50 lb/yd<sup>2</sup>), which are then immediately rolled to achieve 50% to 70% embedment. The treatment is used to seal the pavement surface against weathering, raveling, or oxidation, correct minor roughness or bleeding, and improve friction. Chip seals can be applied in multiple layers (e.g., double chip seal), and in combination with other treatments, such as microsurfacing, which then is referred to as a cape seal (Peshkin et al 2011).

### **SLURRY SEAL/SCRUB SEAL**

Slurry seals are a mixture of well-graded aggregate (fine sand and mineral filler) and asphalt emulsion that is spread over the entire pavement surface with either a squeegee or spreader box attached to the back of a truck. Slurry seals are effective in sealing low-severity surface cracks, waterproofing the pavement surface, and improving friction at low speeds (Peshkin et al 2011).

Scrub seals are an asphalt emulsion sprayed on the pavement surface, then broomed, lightly sanded, broomed again, and rolled. Scrub seals are similar to fog seals and sand seals in terms of their performance, except they can be used to restore friction characteristics. They are effective at reducing or preventing moisture damage, cracking, raveling, roughness, and rutting. Good candidates for scrub seals are pavements with an aged/oxidized surface, low severity raveling, hairline cracking, and good structural capacity (FHWA 2013).

### **ULTRATHIN BONDED WEARING COURSE**

Also known as an ultra-thin friction course, an ultra-thin bonded wearing course may be used as an alternative treatment to chip seals, microsurfacing, or thin HMA overlays. This consists of a gap-graded, polymer-modified HMA layer (0.4 to 0.8-inch thick) placed on a tack coat (heavy, polymer-modified emulsified

asphalt), all applied with a specialty spray paver. It is effective at treating minor surface distresses and increasing surface friction (Peshkin et al 2011).

### **DIAMOND GRINDING**

Diamond grinding is the removal of a thin layer of concrete (usually between 0.12 and 0.25 inches) from the pavement surface, using special equipment fitted with a series of closely spaced diamond saw blades. Diamond grinding removes joint faulting and other surface irregularities, thereby restoring a smooth-riding surface while also increasing surface friction and reducing noise emissions (Peshkin et al 2011).

### **PARTIAL-DEPTH REPAIR**

Partial-depth repairs are placed in small, shallow areas of damaged or deteriorated PCC pavements. These areas are removed and replaced with an approved repair material, thereby maintaining the serviceability of the pavement. Partial-depth repairs are used to correct joint spalling and other surface distresses in the upper third of the slab (Peshkin et al 2011).

### **FULL-DEPTH REPAIR**

Full-depth repairs are cast-in-place or precast concrete repairs that extend through the full thickness of the existing slab, requiring full-depth removal and replacement of full lane-width areas. Full-depth repairs are effective at correcting slab distresses that extend beyond one-third the pavement depth, such as longitudinal and transverse cracking, corner breaks, and deep joint spalling (Peshkin et al 2011).

### **DOWEL BAR RETROFIT/CROSS STITCHING**

Dowel bar retrofitting (DBR) consists of placing mechanical load transfer devices (typically dowel bars) across joints or cracks in an existing jointed PCC pavement. These devices increase the load transfer capacity of the joint or crack, reducing deflections and decreasing the potential for the development of pumping, faulting, and corner breaks (Peshkin et al 2011).

Cross stitching strengthens nonworking longitudinal joints and cracks that are in relatively good condition (IGGA 2010). The construction process consists of grouting tie bars into holes drilled across the joint or crack at angles of 35° to 45° to the pavement surface. This process keeps the crack or joint tight, maintaining good load transfer, and slowing the rate of deterioration (Smith et al 2014).

## B. Benefits

Pavement preservation is a cost-effective means of extending pavement life by applying the right treatment to the right pavement, at the right time. Using **sound construction practices** ensures that preservation treatments are installed without defects and provide the highest service level for the road user. With effective pavement preservation, agencies are better able to meet system-wide pavement performance measures even while funding levels remain constrained. This efficient allocation of resources grows as agencies see improved treatment performance with fewer early treatment failures, and the life-cycle costs of managing pavements decrease.

Several agencies have found that an experienced **contractor base** can develop if the size of their program supports that growth. Preservation projects may be easily bundled together across counties, districts, or regions to develop the quantity of work that minimizes bid prices and maximizes competition. Peer agencies may also be able to partner and combine projects to attract more competition. Industry representatives report that having consistently funded projects of a significant size within a region creates an attractive market from which to base their activities or into which they can develop.

Constructing quality pavement preservation treatments **sustain network performance at a lower cost**, both by delaying the need for more expensive treatments and by reducing the frequency and extent of routine maintenance. Extending the time between rehabilitation or reconstruction expenditures enables agencies to level expenditures across the network. A reduction in required maintenance translates into fewer and shorter lane closures adversely impacting road users and reduced exposure for maintenance workers who perform the maintenance.

### **EDC4 Pavement Preservation: How components lead to improved quality.**

Pavement preservation treatments themselves, applied preventively, typically have lower environmental impacts than more extensive rehabilitation or reconstruction activities. Incrementally increasing the treatment life by using **improved construction practices** and **quality materials** benefit owners and users alike. Producing longer lasting treatments also improves the financial sustainability of a transportation asset management (TAM) program.

Constructing quality pavement preservation treatments with quality materials also contributes to a higher level of service and **an improved user experience**. For example, concrete treatments such as diamond grinding and dowel bar retrofit, and bituminous surface treatments such as chip seal, microsurfacing, and ultra-thin bonded wearing course, improve surface friction and pavement ride. Scrub seals and slurry seals protect the pavement surface and slow the rate of deterioration from environmental causes.

### **C. Challenges**

There is often an opportunity to identify and use locally available materials with excellent material characteristics, but an adequate quality assurance program must be in place. This all begins with an understanding of how materials affect treatment performance. For instance, agencies reporting success using chip seals on high volume roads credit having a durable, clean, single-size aggregate to develop chip embedment and retention in the binder.

Quality construction is closely associated with a quality workforce that operates specialized construction equipment, follows best practices in construction sequencing, and understands the relationship between best practices in construction and good long term performance. Industry and agency training programs and guidelines are helping to advance the state of the practice and transfer the knowledge needed to get a quality product.

### **D. Partners**

Both agency and industry partners have contributed to this innovation through participation in a Technical Working Group (TWG). The TWG prepared and presented materials at the summits and worked together to develop this implementation plan. The members of this TWG are identified in table 1.

### **E. State of Practice**

While pavement preservation is often referred to as “the right treatment on the right pavement at the right time,” this expression does not capture one of the most important aspects of pavement preservation: applying quality construction practices and using quality materials. The past 20 years have seen significant advancements in the quality of the materials used in preservation, as well as technological advancements in equipment and construction methods. At the same time, there is a challenge to connect these advancements with the expected improvements in performance. Moving forward, a focus on the

construction of pavement preservation highlights innovations in treatment materials, construction practices, improved specifications, better equipment, and a greater emphasis on construction quality, all of which lead to longer lasting preservation treatments.

**Table 1: Pavement Preservation: How TWG Members**

<b>Name</b>	<b>Agency</b>
Bryan Cawley	FHWA Headquarters
James Gray	FHWA Headquarters
Laura Lawndy	FHWA Headquarters
Jerry Auge	Ramsey County (MN)
Scott Capps	North Carolina DOT
Michael Sheehan	Olmsted County (MN)
Tracy Nowaczyk	Kentucky Transportation Cabinet
Mike McGee	FHWA Missouri Division
Jim Moulthrop	FP2
John Roberts	International Grooving and Grinding Association (IGGA)
Rusty Price	Intermountain Slurry Seal and International Slurry Surfacing Association (ISSA)
Todd Kinney	Clinton County (Iowa) and National Association of County Engineers
Antonio Nieves	FHWA Headquarters
Leif Wathne	American Concrete Pavement Association

## **MATERIALS**

Many state agencies have developed requirements for higher quality materials for use in pavement preservation treatments and this should be encouraged. For example, the North Carolina DOT has moved to use a more durable aggregate in chip seal applications to reduce the likelihood of aggregate breakage during rolling and seating operations. Clinton County, Iowa uses a high-early strength concrete to construct full-depth repairs to expedite the construction process and limit lane closure time.

## **MIX DESIGN**

Dowel bar retrofit and full- and partial-depth repairs are now used in many situations where once they were not considered due to the development of new fast-setting mix designs for cementitious materials, as well as high-strength, non-cementitious materials that provide rapid curing and great flexibility. These innovations minimize cure times, and therefore road closures, significantly reducing disruption and inconvenience to the driving public.



## **CONSTRUCTION EQUIPMENT**

Equipment used to construct pavement preservation treatments has continued to evolve, accelerating construction and improving quality. For example, specialized pavers have the ability to tack immediately in front of a friction course application. Calibration of equipment prior to the start of a project is essential to assure that the proper amount of materials are proportioned in accordance with the mix design.

## **SPECIFICATIONS**

Improved construction practices are often driven by revised specifications. The Kentucky Transportation Cabinet (KYTC), for instance, follows each pavement preservation construction cycle with a review of applicable specifications in an attempt to improve application, inspection, or to enhance treatment performance. Another example is the North Carolina DOT which, over a period of several years, improved their chip seal specifications based on both research and observed field performance. Other agencies conduct similar reviews periodically which have led to requirements for cleaner, single-sized stone in a chip seal. Polymer-modified binders have also proven beneficial in aiding aggregate retention or enhancing crack mitigation characteristics of microsurfacing or slurry sealing. Specifications for surface preparation have been modified to both increase the tack application rate before a microsurfacing, or to eliminate it all together. In addition to advancements by a number of agencies, at the national level extensive work by the TSP2's Emulsion Task Force has led to the development of greatly improved specifications for emulsion-based surface treatments.

## **CONSTRUCTION TRAINING**

Retirements and shrinking workforces have contributed to the loss of construction and inspection expertise from both transportation agencies and construction companies. More, better, and timely training are essential means of assisting both agencies and industry in maintaining competent technical human collateral to implement quality control and acceptance processes during construction.

## F. Implementation Team and Key Stakeholders

Moving forward, pavement preservation construction innovations will be jointly driven by a team of dedicated implementation professionals and key stakeholders. These groups are briefly described as follows:

**Implementation Plan Leader** – owns the implementation plan and manages the execution of strategies: FHWA Staff.

**Implementation Plan Support Staff** – directly supports the implementation plan leader: combination of FHWA, DOT, local agency, and consultant personnel.

**Advisory Team** – reviews the approach and structure of the strategy and measures progress: TWG personnel.

**Tools and Tactical Team** – executes the strategy and develops the tools: Implementation Plan leader and Implementation Plan support staff will administer and identify tactical team members for individual tasks.

### KEY STAKEHOLDERS

#### Primary stakeholder group:

Transportation System Owners (i.e. State Transportation Agencies, Tribal Organizations, Federal Lands Management Agencies, and Local Public Agencies) – with a focus upon public works and county road engineers, specification writers, resident engineers, materials and tests, and inspection staff who have implemented or are looking to implement these innovations.

Contractors, material suppliers, industry organizations, and consultants – focusing on construction crews performing the construction techniques and performing quality control functions.

Materials Suppliers – those responsible for manufacturing, handling, and providing quality materials.

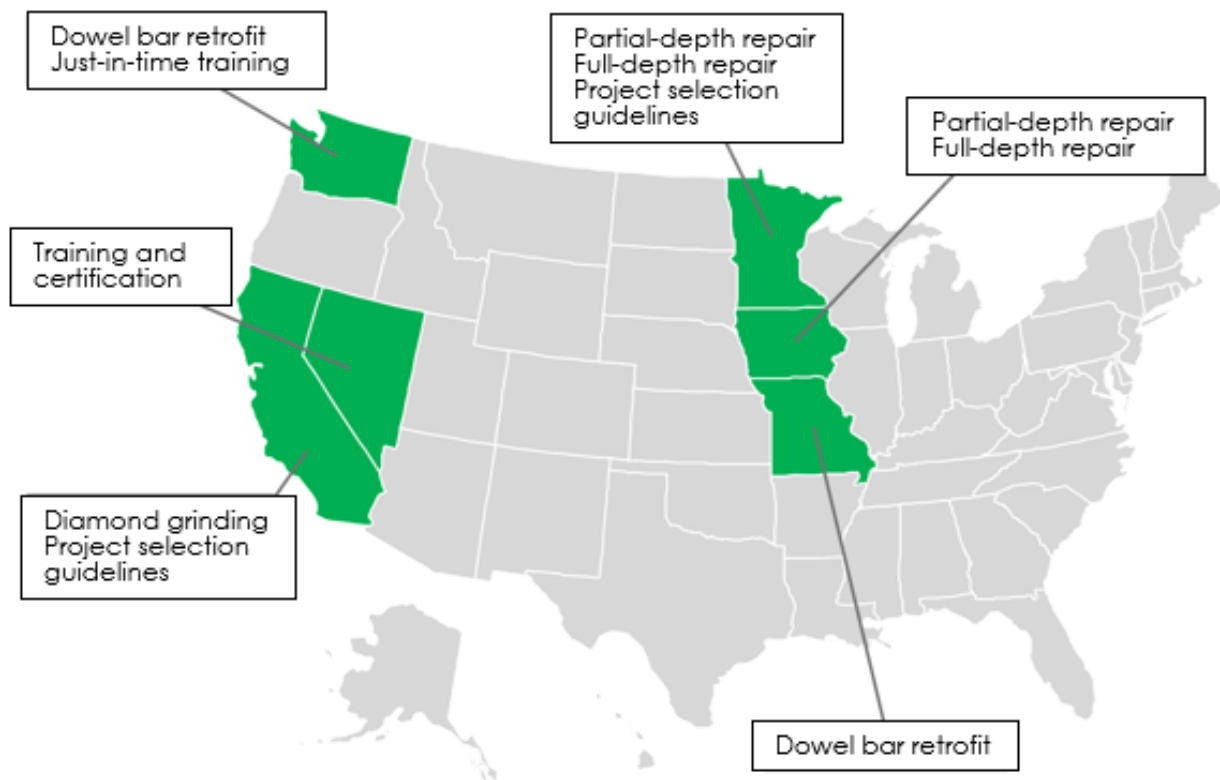
#### Secondary stakeholder group:

Transportation system owners, consultants, and contractors who are either exploring or discussing adoption of these technologies.

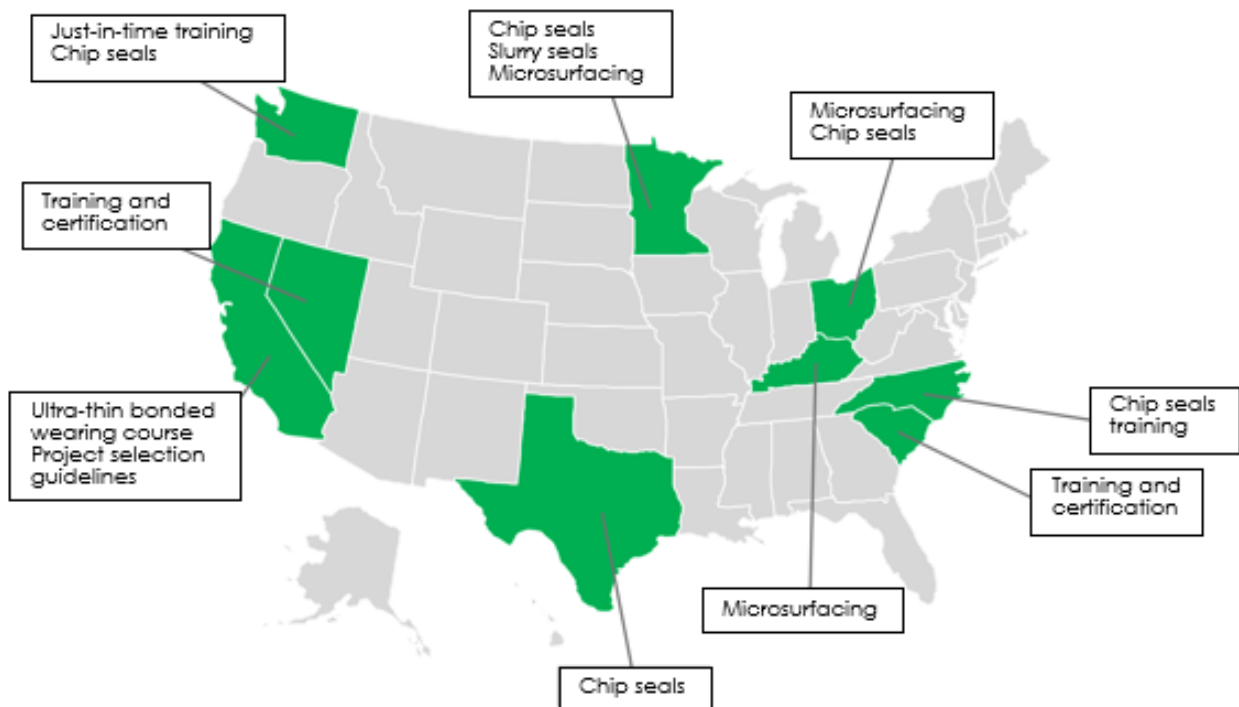
Tertiary stakeholder group:

Road users, who expect safe, smooth, long-lasting roads and the legislative and political bodies who approve funding for roadway programs are also key parties to this innovation.

Figures 1 and 2 illustrate the status of national leaders in the implementation of Pavement Preservation “How” for flexible and rigid preservation treatments. This figure highlights areas in which these agencies are practice-leaders. A color-coded map such as this one will be created to categorize all agencies and then updated on a regular basis to indicate implementation progress.



**Figure 1: Example Graphic to Monitor Implementation Status: Concrete-Surfaced Pavements**



**Figure 2: Example Graphic to Monitor Implementation Status: Asphalt-Surfaced Pavements**

The following are some of the organizations and industry groups identified as champions that will be called upon to assist in implementation.

Organization Champions

- American Association of State Highway and Transportation Officials (AASHTO)
- American Concrete Pavement Association (ACPA: concrete-surfaced pavements)
- American Public Works Association (APWA)
- Asphalt Emulsion Manufacturers Association (AEMA: asphalt-surfaced pavements)
- Asphalt Recycling and Reclaiming Association (ARRA: asphalt-surfaced pavements)
- International Grooving and Grinding Association (IGGA: asphalt-surfaced pavements)
- International Slurry Surfacing Association (ISSA: asphalt-surfaced pavements)
- National Association of County Engineers (NACE)

- National Concrete Pavement Technology Center (CP Tech Center: concrete-surfaced pavements)
- National Local and Tribal Technical Assistance Programs (NLTAPA)
- FP2
- National Center for Pavement Preservation (NCP)

## Section II: Vision and Mission Statement

### **A. Vision**

Mainstream the use of proven and underused quality Pavement Preservation “How” practices, so that agency representatives, contractors, and materials suppliers construct quality treatments with quality materials and construction practices to help maintain a pavement network in a state of good repair.

### **B. Mission Statement**

Promote knowledge transfer and facilitate accelerated national deployment of proven Pavement Preservation “How” practices to construct quality treatments with quality materials.

## Section III: Goals

### A. Team Goal

Develop and execute an implementation plan that meets or exceeds the national goal.

### B. National Goal

Advance the number of transportation system owners experienced in constructing quality pavement preservation treatments.

- 20 States will be classified as national leaders by using revised treatment specifications, training construction and inspection personnel, using new construction materials, and/or adopting improved pavement preservation construction practices during 2017 and 2018.

### C. Pavement Preservation “How” Goal

Increase the knowledge of constructing quality Pavement Preservation treatments with quality materials to realize the complete value of our pavements.

## Section IV: Target Audience

Stakeholders who will benefit from using Pavement Preservation “How” include system owners, contractors, and materials suppliers. In short, the target audience for the Pavement Preservation “How” implementation plan includes all levels of a transportation agency staff, as well as the academic, vendor, consultant, and contractor communities.

To be more specific, key members of the target audience are as follows:

### Transportation Agency

Chief Executive or other decision maker  
Construction Engineer  
Materials Engineer  
Design Engineer  
Maintenance Engineer  
Planner  
Resident Engineer  
Inspector  
Foreman, supervisors and field personnel

### Contractor

Manager  
Project Manager  
Foreman, Supervisor, QC Manager  
Equipment operator and other field personnel

### Supplier

Manager  
QC Manager  
Plant Operator

The following table summarizes the target audience segments and associated characteristics of each group, along with challenges, opportunities, and strategies or products tailored to each.



**Table 2: Target Audience Descriptors**

Agency	Target Audience	Characteristics, Challenges, and Opportunities	Example Strategies, Messages, and Messengers
FHWA	<ul style="list-style-type: none"> <li>Headquarters leadership</li> </ul>	Set strategic direction for implementation, fund technical assistance activities, facilitate deployment	Implementation plan and strategic ideas
	<ul style="list-style-type: none"> <li>Resource Center and Division Offices</li> </ul>	Assist target audience with implementation	Webinars; higher-level awareness information
	<ul style="list-style-type: none"> <li>Federal Lands Highway Divisions</li> </ul>	Implement Pavement Preservation "How" quality construction and materials	Peer exchanges, marketing materials, training, other specific hands-on information
State DOTs	<ul style="list-style-type: none"> <li>Chief executive officers and decision makers, including legislators and external commissions, etc.</li> </ul>	Make funding decisions, set strategic direction for implementation	High-level sales pitch and marketing other concepts, e.g., ROI, network performance impacts, road user satisfaction levels
	<ul style="list-style-type: none"> <li>Construction engineers, materials engineers, project design engineers, and project managers</li> </ul>	Make tactical decisions on technique and materials utilization, convince decision-makers of benefits	Peer exchanges, webinars, benefit-cost information, guide specifications, and resource documentation
	<ul style="list-style-type: none"> <li>On-site resident engineers and project engineers, construction managers, and construction inspectors</li> </ul>	Day-to-day implementation, technique implementation, utilization, and continuous improvement – end user	How-to guides, just-in-time training (online, videos), and reference materials for best practices
Municipalities, Counties, and Tribal public works agencies	<ul style="list-style-type: none"> <li>Chief executive officers and decision makers</li> </ul>	Make funding decisions, set strategic direction for implementation	High-level sales pitch and marketing other concepts, e.g., ROI, network performance impacts, road user satisfaction levels; videos for educating elected officials
	<ul style="list-style-type: none"> <li>Construction engineers, project design engineers, project managers</li> </ul>	Make tactical decisions on system utilization, convince decision makers of benefits, and implement project selection criteria and inspection practices	Peer exchanges, webinars, benefit-cost information, guide specifications, project selection criteria, how-to guides, just-in-time training (online, videos), and reference materials for best practices
Contractors and materials suppliers	<ul style="list-style-type: none"> <li>Chief executive officers and decision makers</li> </ul>	Make budget and bidding decisions, set strategic direction for implementation	High-level sales pitch and marketing concepts
	<ul style="list-style-type: none"> <li>Contractor construction staff</li> </ul>	Users of construction technology and methodology – end user	How-to guides and reference materials for best practices
	<ul style="list-style-type: none"> <li>Materials suppliers</li> </ul>	Users of materials specifications to assure quality materials as specified	How-to guides and reference materials for best practices

## Section V: Marketing Research

### A. General Research Approach

In order to provide a clear pathway forward, the Pavement Preservation “How” Team evaluated the potential obstacles to implementation, and identified opportunities, strategies, tools, and tactics for mitigating the barriers to deployment and furthering implementation of the innovation.

**Table 3: Implementation Opportunities, Obstacles, Strategies, Tools, and Tactics**

Opportunities / Obstacles	Strategy	Tools / Tactics
Outdated specifications for the targeted pavement preservation treatments.	Provide model specifications for treatments considering geographical location and climate.	Video guidance to accompany the inspector checklist.
Lack of opportunities to learn from other practitioners	Provide peer to peer technology transfer opportunities	Peer exchanges, peer to peer mentoring, demonstration projects.
Project inspection teams are competent and familiar with installation requirements and quality assurance practices.	Assist owners and contractors in maintaining a well-trained workforce to construct and accept a quality product.	Appropriate workshops, training materials.
Public stakeholders understand why pavement preservation is performed and what to expect from the projects.	Provide a tool box of communication tools enabling practitioners and public relations officers to educate the public and elected officials.	Sample press releases, treatment photos, process descriptions, and social media messages.
Contractor availability	Assist in promoting bid opportunities for agencies	Provide contract language for local usage of state contract prices. Encourage bundling of projects.

## Section VI: Performance Measures

As noted in section III, the national goal of this innovation is that 20 state agencies will be classified as national leaders by the end of 2018. The success of the implementation plan will be ensured through closely tracked and measured deployment goals. For each goal, specific objectives and strategies will be achieved through focused activities with quantifiable and achievable performance metrics.

Evaluation of the implementation plan will occur at several interim stages during implementation, and measureable targets have been established as a means of assessing progress. The feedback provided at several stages throughout the schedule will provide accountability for the Implementation Team, highlight early success, and show progress toward our implementation goals.

Table 4 provides an overview of how agencies can be classified as they progress toward becoming national leaders. The steps in that progression are briefly described as follows:

- National Leader: Successfully deployed revised preservation treatment specifications, provided training for construction and inspection personnel, incorporated improved material qualities into treatment specifications, or adopted improved construction practices.
- Under Assessment/Exploring: Have requested information and/or training about revised specifications, inspection methods, construction technologies, or quality materials.
- Discussing: Attended an EDC-4 Summit, but have not yet elected to participate in this national EDC-4 technology initiative.

**Table 4: Implementation Phase: Pavement Preservation “How”**

Implementation Phase	Considerations
<p><b>National Leader:</b> The Transportation Agency has successfully deployed revised preservation treatment specifications, provided training for construction and inspection personnel, incorporated improved material qualities into treatment specifications, or adopted improved construction practices on at least 3 projects or 10 miles of preservation treatment.</p>	<ul style="list-style-type: none"> <li>• Has the Agency revised specifications for construction or materials used in the preservation treatment?</li> <li>• Has the agency developed and made available training addressing construction quality?</li> <li>• Is the Agency routinely considering the treatment or materials on future projects?</li> <li>• Is the Agency willing to share their successful practice with other agencies?</li> </ul>
<p><b>Under Assessment:</b> The Transportation Agency has chosen and constructed 1 or 2 new successful pavement preservation projects applying the improved construction practices.</p>	<ul style="list-style-type: none"> <li>• What quality construction practices were deployed?</li> <li>• What training was used to prepare staff for these projects?</li> <li>• What are you planning to do differently on your next project?</li> <li>• What public outreach/training was performed?</li> </ul>
<p><b>Exploring:</b> The Transportation Agency has requested information and/or training about revised specifications, inspection methods, construction technologies, or quality materials.</p>	<ul style="list-style-type: none"> <li>• Have you visited or been in communication with another Transportation Agency that has experience constructing the treatment(s) you are considering?</li> <li>• What training are you considering to ensure success?</li> <li>• What assistance do you need to progress to implementation?</li> </ul>
<p><b>Discussing:</b> The Transportation Agency is seeking information and designing a new pavement preservation treatment.</p>	<ul style="list-style-type: none"> <li>• What informational resources has the Transportation Agency sought and received?</li> <li>• What training or technology sharing activities (i.e., workshops, webinars, web-based training, peer exchanges, etc.) has the Transportation Agency participated in or plans to?</li> <li>• Has the Transportation Agency sought out national leaders for assistance in implementing the technology?</li> <li>• Has the Transportation Agency developed a plan to implement Pavement Preservation construction and maintenance best practices?</li> </ul>
<p><b>Not Participating:</b> Agency is not implementing Pavement Preservation “How” or not interested in EDC initiatives.</p>	<ul style="list-style-type: none"> <li>• Why?</li> </ul>

## Section VII: Work Plan

Table 5 highlights the identified activities and anticipated leads to follow up on implementation. The identified implementation activities reflect feedback received from participants at the Fall 2016 summits held around the country. The feedback from those summits has also helped to identify potential audiences for these activities, and the type of message that would successfully target those different audiences. The primary responsibility for carrying out the implementation efforts rests with the FHWA, this initiative's Technical Working Group, and appropriate industry organizations.<sup>2</sup> This work plan matrix should be well integrated with the implementation phases indicated in table 4.

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<sup>2</sup> The industry organizations and affiliated groups which are expected to support the work plan include, but are not limited to, the following: AASHTO, ACPA, AEMA, APWA, CP Tech Center, FP2, IGGA, ISSA, and NCPP.

**Table 5: Work Plan**

Implementation Activity	Audience	Message	Responsibility
Peer-to-Peer Exchanges (exploring with lead agencies)	State and local agency construction personnel, designers, and maintenance	Experience of national leaders shared with neighboring and other agencies accelerates knowledge transfer and adoption.	FHWA and industry organizations
Videos highlighting best practices	State and local agencies, contractors, and consultants	Just-in-time training accessible in the field are timely reminders of best practices in construction.	FHWA and industry organizations
Development and delivery of web-based construction training	State and local agencies, contractors, and consultants	Training contributes to a skilled workforce able to design, construct, and inspect/accept quality treatments.	FHWA and industry organizations
Development of Best Practice Technology Briefs with example specifications, training, etc.	State and local agencies, contractors, and consultants	Best Practice briefs introduce or remind users of the factors that lead to quality preservation treatments and provide resources for more information.	FHWA and industry organizations
Updated specifications for the targeted pavement preservation treatments	State and local agencies, contractors, and consultants	Updated specifications contribute to construction and performance of quality preservation treatments	TSP2 Emulsion Task Force; PPETG (PCC Preservation)
"Tool Box" of messages on the importance of quality materials and construction in successful preservation programs.	Public, elected officials, agency management	A tool box of communication tools aids in the education of those who don't understand what preservation is or why it's being used.	

## **A. Concluding Remarks**

Pavement preservation is an increasingly common component of transportation agencies' tools for managing their roadway networks. The EDC-4 Pavement Preservation "How" initiative offers a timely opportunity to improve the practice and performance of pavement preservation by encouraging the use of proven construction practices and quality materials. At summit after summit, across the United States, workshop discussions of this innovation emphasized the need for better specifications and more accessible training. In response to the agency and contractor presentations, participants asked insightful questions about how they could deploy these innovations and improve their overall pavement preservation programs. They also asked challenging questions about both new and proven technologies and were excited about the advancements that they heard about.

Pavement Preservation "How" will support improved treatment specifications, peer exchanges between national leaders and their aspiring neighbors and colleagues, more training and especially "just-in-time" training, targeted technology briefs, and other communication tools for diverse audiences, in order to achieve the national implementation goal.

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