

# EDC-4 Pavement Preservation (When, Where, and How) Update



2018 Northwest Pavement Management  
Association Conference  
October 24, 2018

Jason Dietz, Pavement and Materials Engineer  
Denver, CO



# Park Ave – September 22, 2016

## Neighbor in CT

**2004:** 2" Mill & Fill

## Fairfield, CT

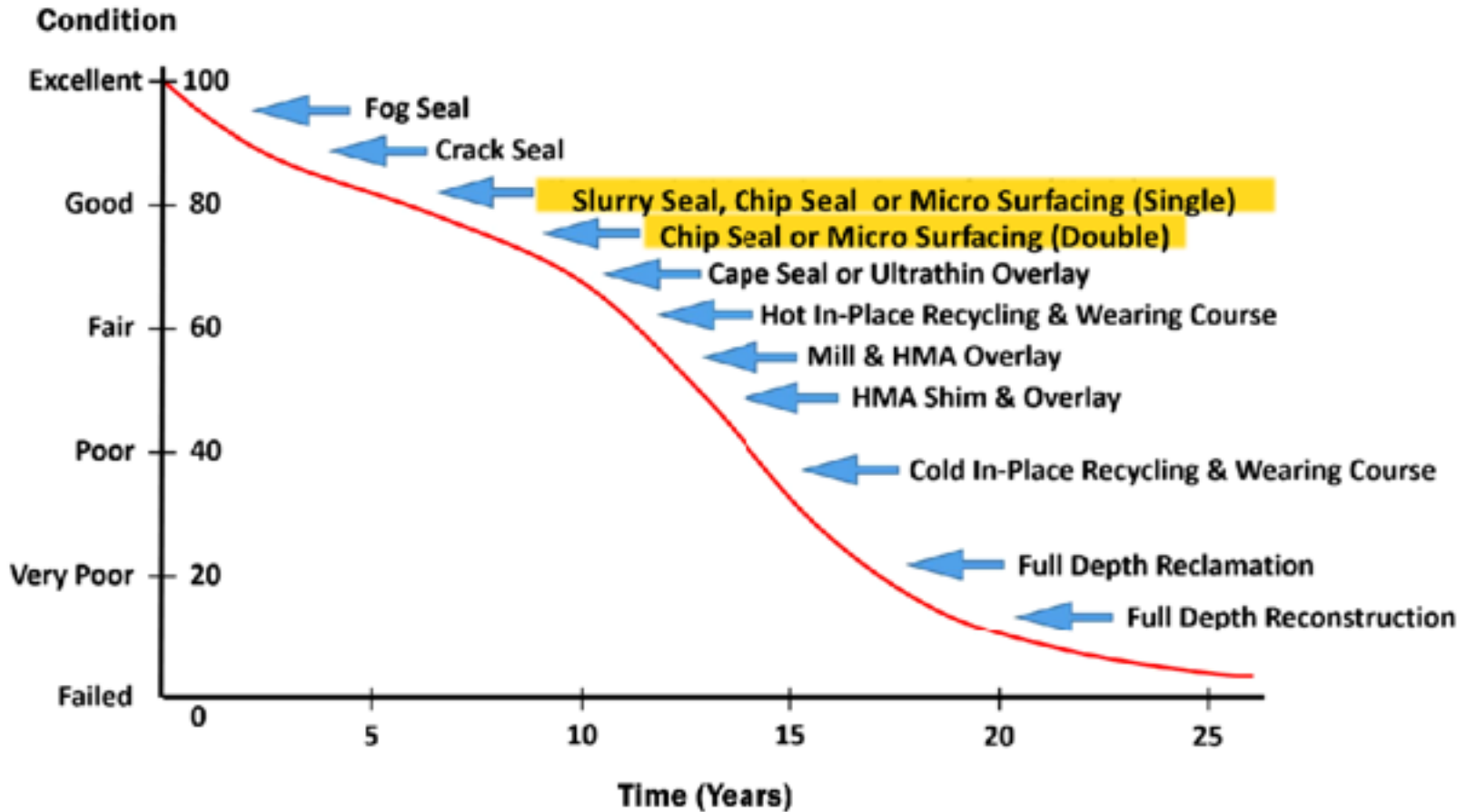
**2004:** 2" Mill & Fill

**2010:** Crack Sealing &  
Micro Surfacing

# Pre-Construction Planning

- ✓ **Right Job**
- ✓ **Right People**
- ✓ **Right Materials**
- ✓ **Right Equipment**

# Right Job?





# Right Job

**Candidate selection is critical!**



**Good Candidate**



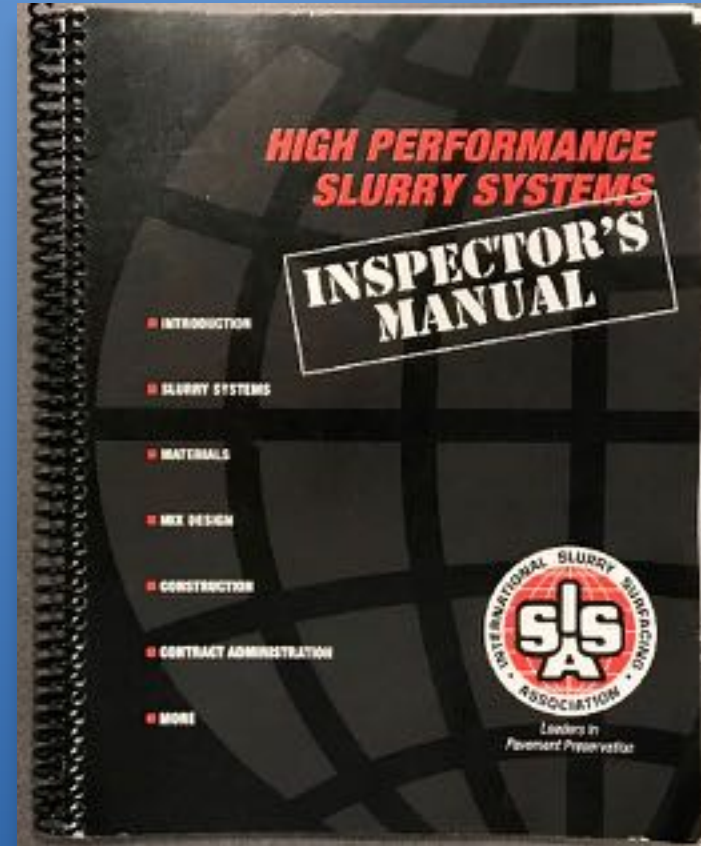
**Poor Candidate**

# Right Job

- **Candidate selection is critical**
- **Confirm appropriate specs**
- **Detailed traffic control plan**



# Right People - Inspector Resources



# Right Materials?

- **Mix design and JMF by an AASHTO resource accredited lab**



## TYPE 2 MICRO-SURFACING DESIGN

MIX DESIGN		No.	
AGGREGATE:		100.0	%
EMULSION:		13.0	%
RESIDUAL ASPHALT:		8.3	%
POLYMER MODIFIER:		3.0	%
FIELD CONTROL ADDITIVE:		as needed	%
MINERAL FILLER:		1.0	%
WATER:		11.0	%
TRAFFIC VOLUME:	<4000		>4000

AGGREGATE		
SOURCE NAME & ADDRESS:		SOURCE NO. & REPORT NO.:
100% TILCON HAVERSTRAW		
GRADATION		
SIEVE SIZE	% PASSING	SPECIFICATION min-max
9.5 mm	100.0	100
4.75 mm	98.0	90 - 100
2.36 mm	78.0	65 - 90
1.18 mm	54.0	45 - 70
0.600 mm	39.0	30 - 50
0.300 mm	28.0	18 - 30
0.150 mm	14.5	10 - 21
0.075 mm	5.8	6 - 16
SAND EQUIVALENCY		82.0 %

MINERAL FILLER		
PRODUCT:	TYPE:	SOURCE:
Portland Cement	Type III	Lafarge N. America

FIELD CONTROL ADDITIVE	
PRODUCT:	SOURCE:
Proprietary	Suit-Kote

POLYMER MODIFIER SYSTEM	
PRODUCT:	SOURCE:
LATEX	VARIOUS



ASPHALT EMULSION	
SOURCE:	TYPE:
Suit-Kote	CQS-1HP
Residue After Distillation:	64.0 %
TESTS ON RESIDUE	
Softening Point (AASHTO T50)	60 °C
Penetration at 25C (AASHTO T49)	80 mm

MIX DESIGN TEST RESULTS		
Wet Cohesion (ISSA TB 135)	90 minutes	16.0 kg-cm
	90 minutes	21.0 kg-cm
Wet Track Abrasion Loss (ISSA TB 100)	1 hour soak	165.5 g/m <sup>2</sup>
	3 day soak	120.7 g/m <sup>2</sup>
Mix Time (ISSA TB 113)		150 sec.
Classification Compatibility (ISSA TB 144)		11 points
Wet Stripping (ISSA TB 114)		96 %
Loaded Wheel Test (ISSA TB 106 & ISSA TB 147A)	Excess Asphalt	369.6 g/m <sup>2</sup>
	Lateral Displacement	3.8 %
	sq @ 1000 cycles	1.928

TESTING PERFORMED BY:			
LABORATORY/COMPANY NAME:	ADDRESS:	1911 Lorings Crossing Cortland, N.Y. 13845	
CONTACT NAME:	PHONE #:	607-753-1100	FAX #:
Brent Hall / Mark Slocum			607-756-5619
			20112

# Right Materials

- **Mix design and JMF by AASHTO resource accredited lab**
- **Approved sources (aggregate & emulsion)**
- **Procedures to verify conformance**



# Right Equipment

- **Clean & leak-free**
- **Continuous paver for highway work**
- **Enough support trucks**
- **Properly calibrated**

# Calibration is Key!

## HIGH PERFORMANCE SLURRY SYSTEMS

### INSPECTOR'S MANUAL

- INTRODUCTION
- SLURRY SYSTEMS
- MATERIALS
- MIX DESIGN
- CONSTRUCTION
- CONTRACT ADMINISTRATION
- MORE



#### F. Field Calibration Procedure Worksheet

Job # \_\_\_\_\_ Unit # \_\_\_\_\_ Date \_\_\_\_\_

### Aggregate Calibration

"Minimum 30 counts of the Rock Bell counter per Sample (3 Samples Per Gate Setting)"

GATE SETTING (Inches)	Full Weight LBS	Empty Weight LBS	Net Weight LBS (= Full - Empty)	No. of Counts	LBS per Count
3					
Sample 1					
Sample 2					
Sample 3					

Avg Wet App. Lbs./Count \_\_\_\_\_ Moisture Factor \_\_\_\_\_ Dry App. Lbs./Count \_\_\_\_\_

GATE SETTING (Inches)	Full Weight LBS	Empty Weight LBS	Net Weight LBS (= Full - Empty)	No. of Counts	LBS per Count
4					
Sample 1					
Sample 2					
Sample 3					

Avg Wet App. Lbs./Count \_\_\_\_\_ Moisture Factor \_\_\_\_\_ Dry App. Lbs./Count \_\_\_\_\_

GATE SETTING (Inches)	Full Weight LBS	Empty Weight LBS	Net Weight LBS (= Full - Empty)	No. of Counts	LBS per Count
5					
Sample 1					
Sample 2					
Sample 3					

Avg Wet App. Lbs./Count \_\_\_\_\_ Moisture Factor \_\_\_\_\_ Dry App. Lbs./Count \_\_\_\_\_

Date must be entered in the Full Weight, Empty Weight, and Number of Counts Columns.  
No additional data is needed.

\*\*\* Gate Settings and the Moisture Factor Must Be Adjusted per Calibrations. \*\*\*

\*\*\* Moisture Factor = Moisture Content (in decimal) 0.000 + 1.00 \*\*\*

\*\*\* DON'T FORGET TO ENTER DATE & UNIT NUMBER \*\*\*



U.S. Department  
of Transportation  
Federal Highway  
Administration

Center for Accelerating Innovation



*On-Ramp to  
Innovation*  
every day counts

## EDC-4 Pavement Preservation: When & Where

Benefits to using a Whole-Life approach to pavement preservation project and treatment selection.

# Technical Working Group Team

<p>Thomas Van Office of Asset Management, FHWA 202-366-1341 <a href="mailto:Thomas.Van@dot.gov">Thomas.Van@dot.gov</a></p>	<p>Stephen Gaj Office of Asset Management, FHWA 202-366-1336 <a href="mailto:Stephen.Gaj@dot.gov">Stephen.Gaj@dot.gov</a></p>	<p>Max Grogg Office of Asset Management, FHWA 515-233-7306 <a href="mailto:Max.Grogg@dot.gov">Max.Grogg@dot.gov</a></p>	<p>Jason Dietz Resource Center, FHWA 720-963-3213 <a href="mailto:Jason.Dietz@dot.gov">Jason.Dietz@dot.gov</a></p>
<p><b>Andrew Williams</b> Ohio DOT 614-752-4059 <a href="mailto:Andrew.Williams@dot.ohio.gov">Andrew.Williams@dot.ohio.gov</a></p>	<p><b>Jeff Uhlmeyer</b> Washington State DOT 360-709-5485 <a href="mailto:Uhlmeyj@wsdot.wa.gov">Uhlmeyj@wsdot.wa.gov</a></p>	<p><b>John Senger</b> Illinois DOT 217-782-2799 <a href="mailto:John.Senger@Illinois.gov">John.Senger@Illinois.gov</a></p>	<p><b>Geoff Hall</b> Maryland DOT 443-572-5067 <a href="mailto:GHall1@sha.state.md.us">GHall1@sha.state.md.us</a></p>
<p><b>Anita Bush</b> Nevada DOT 775-888-7487 <a href="mailto:abush@dot.state.nv.us">abush@dot.state.nv.us</a></p>	<p><b>Sui Tan</b> Metropolitan Transportation Commission 415-778-5244 <a href="mailto:stan@mtc.ca.gov">stan@mtc.ca.gov</a></p>	<p><b>Susan Gresavage</b> New Jersey DOT 609-530-4689 <a href="mailto:Susan.Gresavage@dot.state.nj.us">Susan.Gresavage@dot.state.nj.us</a></p>	<p><b>Machelle Watkins</b> Missouri DOT 573-526-1374 <a href="mailto:Machelle.Watkins@modot.mo.gov">Machelle.Watkins@modot.mo.gov</a></p>
<p><b>Tammy Haas</b> New Mexico DOT 505-794-2126 <a href="mailto:Tamarap.has@state.nm.us">Tamarap.has@state.nm.us</a></p>	<p><b>Dave Janisch</b> Minnesota DOT 651-366-5567 <a href="mailto:Dave.Janisch@state.mn.us">Dave.Janisch@state.mn.us</a></p>	<p><b>Leif Wathne</b> American Concrete Pavement Association 202-330-3492 <a href="mailto:lwathne@acpa.org">lwathne@acpa.org</a></p>	<p><b>Audrey Copeland</b> National Asphalt Pavement Association 301-731-4621 <a href="mailto:Audrey@asphaltpavement.org">Audrey@asphaltpavement.org</a></p>



# EDC-4 When and Where

## Vision

- Focus the use of preservation to **promote** effective strategies that **reduce** the annual cost of managing the pavement network at acceptable performance levels.

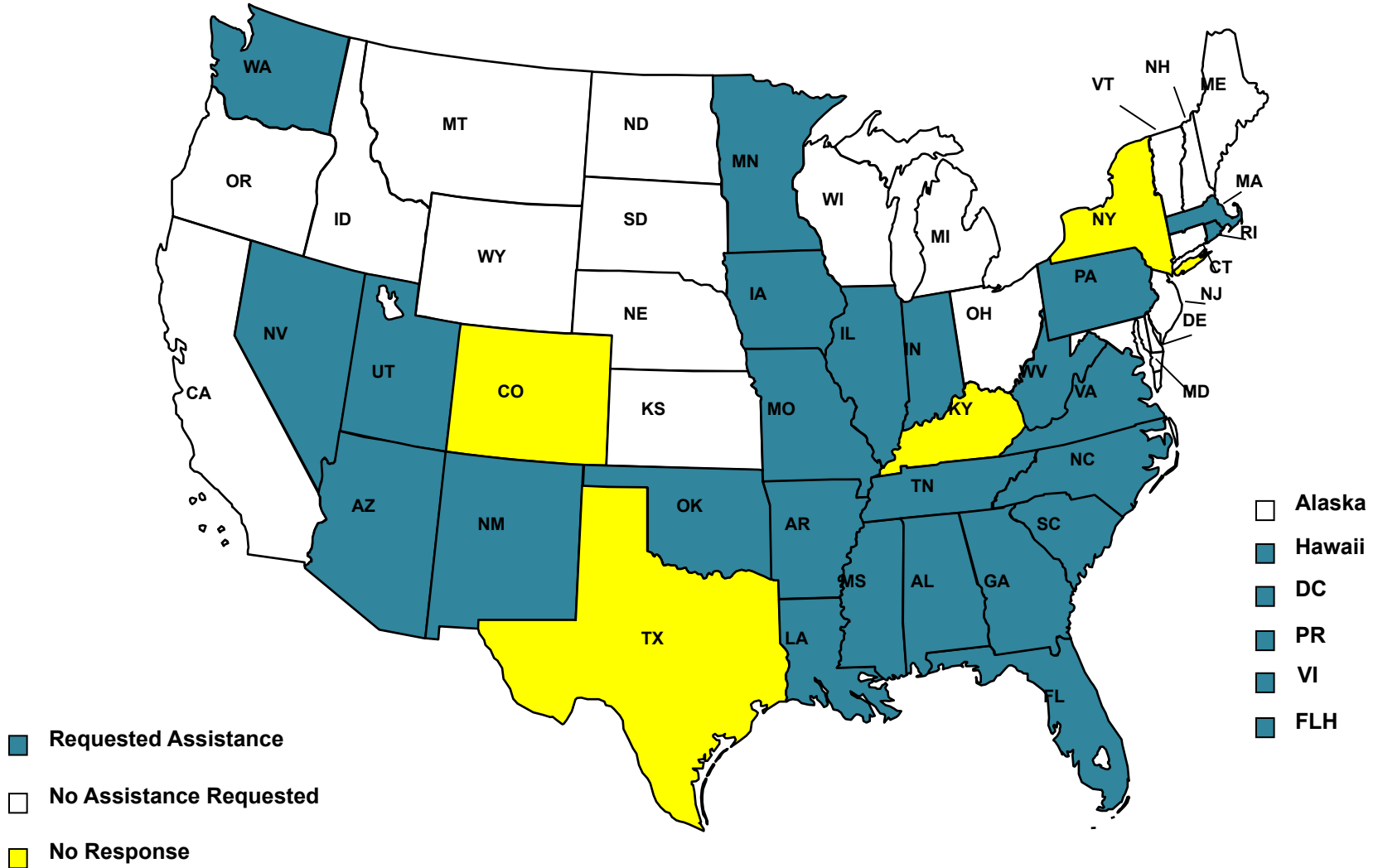
## Mission

- Provide **guidance** and **implementation tools** that
  - ✓ **Assist** agencies in selecting cost-effective pavement preservation projects that **sustain** pavement performance programs
  - ✓ **Demonstrate** the cost savings and other benefits that can be realized through effective pavement preservation programs
  - ✓ **Facilitate** accelerated national deployment of proven practices that support inclusion of pavement preservation as an asset management strategy.

# National Goal

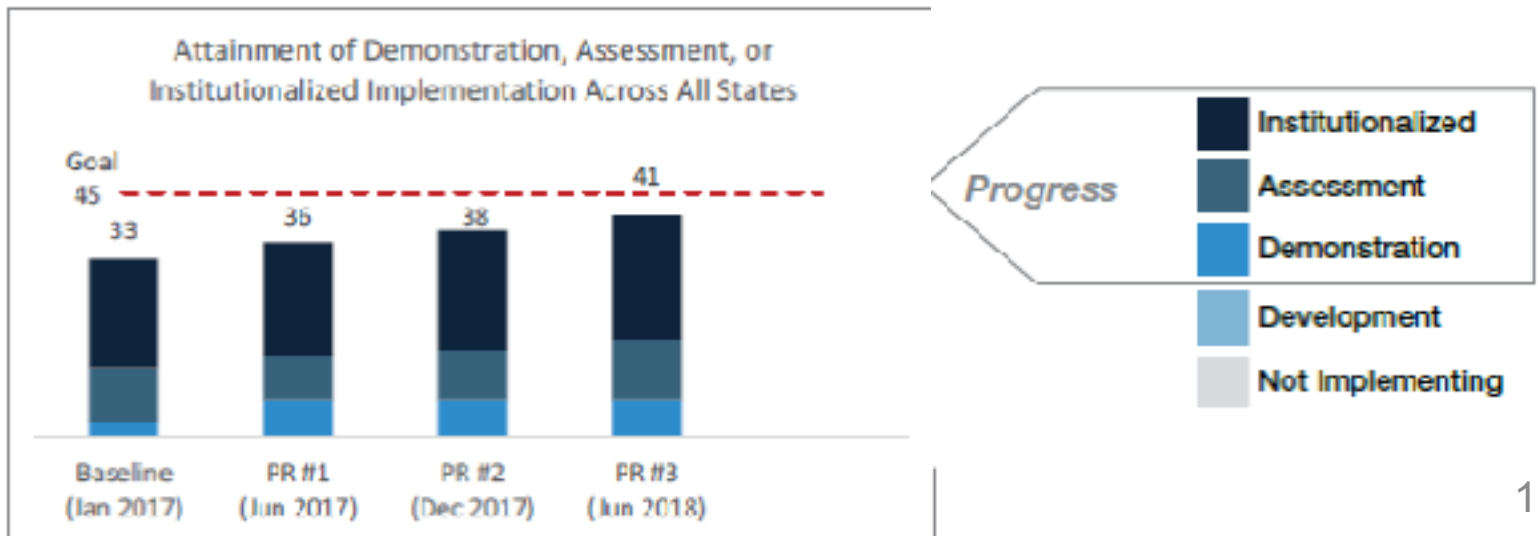
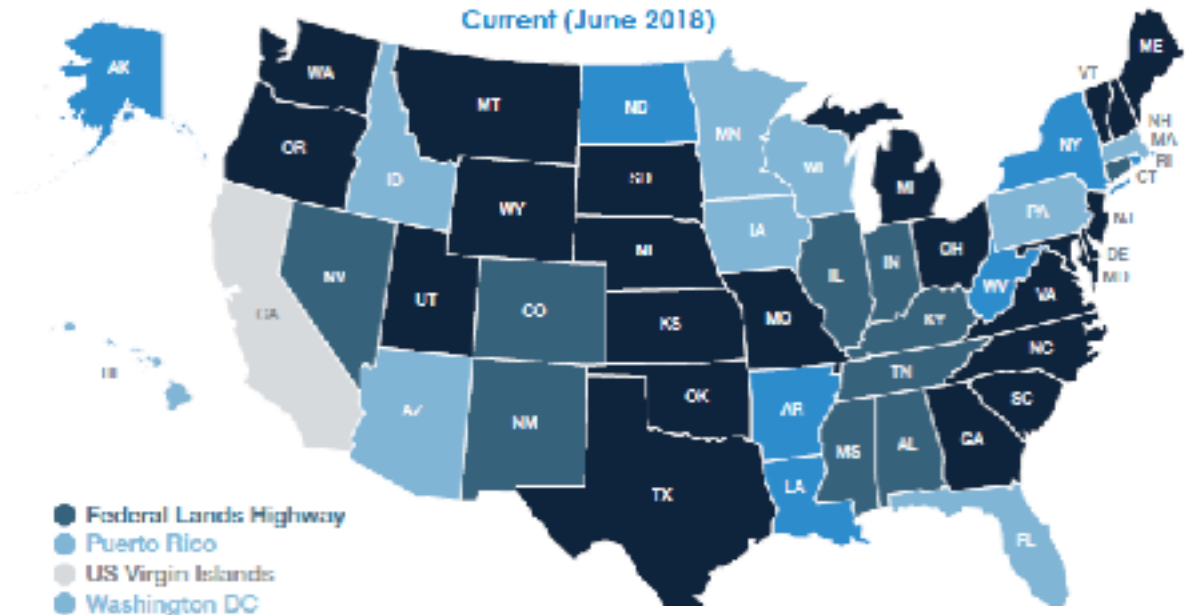
By the end of the project, ensure that at least **10** of the **States or local agencies** that have requested assistance have institutionalized policies governing the selection of pavement preservation projects to support sustainable pavement performance.

# States Requesting Assistance



# National Goal

Ensure **States or local agencies** have institutionalized policies governing the selection of pavement preservation projects to support sustainable pavement performance.







# Why Is This Important?

# Federal Legislation

- Performance-based investment decisions
- Development of a 10-year Transportation Asset Management Plan
  - Includes consideration of life cycle planning & risk
  - Sets minimum standards for the use of pavement management systems
  - Links investments to performance targets

# Activities

- **Implementation Plans (26 states)**
- **3 Peer-to-Peer Exchanges to 22 states (complete)**
  - (CO, NM, NV, TX, WA, AZ, KS, MN, **AL, GA, KY, FL, SC, MO, MS, CT, WV**, MD, IL, RI, NY, VA, EFL)
- ***Integrating Pavement Management to Selecting Pavements for Preventive Maintenance 1.5 Training Workshops***
  - Provided (**OK, LA, FL, WA, MO**, IL, NM, CO, HI, **CA, ID, WI**) **601 participants (complete)**
  - Upcoming (UT, PA)
- **Webinar (March 27, 2019)**
- **4-hour Workshop at Regional Pavement Preservation Partnership Workshops (Spring – Fall 2019)**

# Activities (cont.)

- Peer exchanges report
- Synthesis of Current Practices and Guidance for Adopting Pavement Preservation into Strategic Programs
- Guidance Document: Selection and Implementation of Pavement Preservation Measures, Metrics, Triggers and Thresholds
- Developing an effective tool





## EDC-4 DEPLOYMENT TEAM IMPLEMENTATION PLAN

May 30, 2017

State DOT Team Co-Chair	FHWA Team Co-Chair	EDC Team Initiative Title (Tool or Technology)	
Edmund Naras	Gregory Doyle	Pavement Preservation ( <i>When, Where, and How</i> )	
A – Team Members		B – Need/Application & Implementation Issues to Address	
<p>Curtis Bradley – MassDOT, OTP, Research            Jackie DeWolfe – MassDOT, OSI, Sustainable Mobility            Cody Holomo – MassDOT, D-4, Highway Maintenance            Jack Moran – MassDOT, Asset Management            Andy Paul – MassDOT, Highway Design            Jonathan Smith – MassDOT, Pavement Mgmt            Conrad Leger – ACEC (BETA Engineering)            John Livsey – Town of Lexington            Alan Chicoine – CIM (Allstates Asphalt)            Dan Patenaude – CIM (Sealcoating, Inc.)            John Pourbaix – CIM            Jason Dietz – FIWA, RC Pvmt &amp; Mats TST</p>		<ul style="list-style-type: none"> <li>No MassDOT Pvmt. Preservation (PP) policy/program across Districts (PP treatments used on project by project basis)</li> <li>Lack of dedicated funding/line item in STIP for PP treatments.</li> <li>Healthy Transportation Policy (HTP) requirements can add project scope/cost that can make PP treatments not feasible.</li> <li>Need updated PP Manual/Treatment Matrix.</li> <li>No statewide effort for Local Agencies to consider “whole-life” investment and implement PP as standard business practice (some Local Agencies do apply PP on own).</li> <li>Preservation of sidewalks, bike-paths, &amp; other assets</li> <li>Quantify benefits of PP (condition, financial, mobility, environ )</li> </ul>	
C – Desired Outcome (2017-2018 Goals)		D – Performance Measures	
<ol style="list-style-type: none"> <li>Develop MassDOT Pvmt Mgmt/Preservation (PP) policy/program (objectives, funding, roles, &amp; treatment scope).</li> <li>Prepare &amp; issue PP Communication Plan.</li> <li>Explore dedicated funding levels/item for PP treatments.</li> <li>Assist &amp; inform in updating Healthy Transportation Policy (HTP) criteria applicable to PP treatment projects</li> <li>Identify at least 5 candidate 2019 PP projects in Districts.</li> <li>Engage Local Agencies on use of PP as “whole-life” investment and standard business practice.</li> </ol>		<ol style="list-style-type: none"> <li>MassDOT Pvmt. Mgmt/Preservation (PP) policy/program developed.</li> <li>PP Communication Plan prepared and issued.</li> <li>Dedicated funding levels/item for PP treatments explored</li> <li>Healthy Transportation Policy (HTP) criteria applicable to PP treatment projects updated.</li> <li>At least 5 candidate 2019 PP projects in Districts identified</li> <li>Local Agencies engaged on use of PP as “whole-life” investment and standard business practice</li> </ol>	

## EDC-4 DEPLOYMENT TEAM IMPLEMENTATION PLAN

### E – Implementation Plan Activities

Activity No.	Description of Activity	Target Completion Date	Schedule/Status
1	Develop MassDOT Pwmt. Mgmt (PM) and Pwmt Preservation (PP) policy/program (objectives, funding, roles, treatment scope) <b>Committee:</b> F. Naras, G. Doyle, J. Moran, A. Paul, C. Leger	June 30, 2017	
2	Issue MassDOT Pwmt. Mgmt/Preservation (PP) Policy Directive <b>Committee:</b> F. Naras, G. Doyle, J. Moran, A. Paul, C. Leger	September 1, 2017	
3	Prepare updated PP Manual/Treatment Matrix <b>Committee:</b> F. Naras, J. Smith, C. Holeno, A. Chicone, C. Leger, J. Dietz	June 2018	
4	Prepare Objectives & Outline for PP Communication Plan <ul style="list-style-type: none"> <li>• Why are we spending money on good roads?</li> <li>• Legislative, In-House MassDOT, Cities &amp; Towns, Public)</li> </ul> <b>Committee:</b> J. Moran, J. DeWolfe, D. Patenaude, J. Livsey, J. Pourbaix	November 1, 2017	
5	Prepare Draft PP Communication Plan <b>Committee:</b> J. Moran, J. DeWolfe, D. Patenaude, J. Livsey, J. Pourbaix	January 2018	

## **PAVEMENT PRESERVATION POLICY DIRECTIVE**

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**Secretary of Transportation and Chief Executive Officer**

**Highway Division Administrator**

**MBTA General Manager and Rail and Transit Administrator**

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**Aeronautics Division Administrator**

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**Executive Director, Office of Transportation Planning**

### **I. Pavement Preservation Policy Directive:**

Pavement Preservation is a planned system of treating pavements at the optimum time to maximize their useful life, thus enhancing pavement longevity at the lowest cost to the agency. To further MassDOT's Capital Investment Plan (CIP) vision on Reliability and to encourage Local Agency use of preservation strategies, this *Pavement Preservation Policy Directive* is issued to ensure that the annual program is implemented through a program of long term network level preservation strategies for both State and Local agencies.

### **II. Goal:**

The goal of pavement preservation is to "apply the right treatment, to the right pavement, at the right time." These practices result in an outcome of "keeping good roads in good condition." To achieve this goal, it is the policy of MassDOT that as part of the annual pavement program each District shall include pavement preservation projects/activities. The actual pavement preservation projects/activities completed shall be reported annually. This directive builds on other existing guidance that addresses such issues as project scope.

Category	Description	Parameters	Routine Maintenance (Good)		Preventative Maintenance (Fair)						Minor Rehabilitation (Poor)			
			Creek Seal	Fog Seal	Chip Seal	Microsurfing	Rubber Chip Seal	Cope Seal	Ultra Thin Bonded Wearing Course	3/4" Overlay	Hot In-Place Recycling	Level and Overlay	Mill and Overlay	Cold In-Place Recycling
Roadway Classification	Urban Suburban		✓	✓	✗	✓	•	•	✓	✓	✓	✓	✓	✓
	Rural		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Traffic (ADT)	< 1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		1000-8000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Existing Surface Distress	Alligee Cracking	Low	✓	•	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Moderate	✓	•	•	•	•	•	•	✓	•	•	•	✓
		High	•	✗	•	•	•	•	•	•	•	•	•	✓
	Transverse Cracking	Low	✓	•	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Moderate	✓	•	•	•	•	•	•	✓	•	•	•	✓
		High	•	✗	•	•	•	•	•	•	•	•	•	✓
	Longitudinal Cracking	Low	✓	•	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Moderate	✓	•	•	•	•	•	•	✓	•	•	•	✓
		High	•	✗	•	•	•	•	•	•	•	•	•	✓
	Potholes	Low	N/A	•	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Moderate	N/A	•	•	•	•	•	•	✓	•	•	•	✓
		High	N/A	✗	✗	✗	✗	✗	✗	✓	•	•	•	✓
	Bowling	Low	N/A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Moderate	N/A	•	•	•	•	•	•	✓	•	•	•	✓
High		N/A	✗	•	•	•	•	•	•	✓	•	•	✓	
Rutting	< 3/8 in	N/A	✗	•	•	•	•	•	•	✓	✓	✓	✓	
	3/8 - 3/4 in	N/A	✗	•	•	•	•	•	•	✓	•	✓	•	
	> 3/4 in	N/A	✗	✗	•	•	✗	•	✗	✓	•	•	•	
Utility Patching		N/A	✗	✓	✓	✓	✓	✓	✓	•	✓	✓	✓	
New Surface	Final Surface Texture	Smooth	N/A	Smooth	Coarse	Smooth	Coarse	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	N/A
		Coarse	N/A	Smooth	Coarse	Smooth	Coarse	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	N/A
		Wearing Course Required?	No	No	No	No	No	No	No	No	Yes	No	No	Yes
	Average Life Extension	Years	3	3	6	7	8	10	10	10	10	10	12	14
2022 Costs	Cost (per SY)	Low	\$0.85	\$1.00	\$2.50	\$3.00	\$4.50	\$4.50	\$5.00	\$6.00	\$4.00	\$5.00	\$10.00	\$6.00
		High	\$0.75	\$1.50	\$1.00	\$5.00	\$1.25	\$6.00	\$7.00	\$8.00	\$6.00	\$12.00	\$14.00	\$8.50
	Equivalent Annual Cost (\$/yr)	Low	\$0.12	\$0.33	\$0.41	\$0.43	\$0.56	\$0.43	\$0.50	\$0.64	\$0.40	\$0.80	\$0.83	\$0.43
		High	\$0.28	\$0.50	\$0.50	\$0.71	\$0.66	\$0.80	\$0.70	\$0.86	\$0.60	\$1.20	\$1.17	\$0.61

✓ Likely Candidate

• Possible Candidate

✗ Not a Likely Candidate

N/A Likely Not Applicable

Rutting Distress Level

PCI Range

BSI Range

1 to 5 Scale

Good

Fair

Poor

95-70

85-65

70-40

1 to 2

2 to 3

3 to 6





## Guidelines for the Preservation of High-Traffic-Volume Roadways (R26)

*Your guide to the most-affordable options for extending pavement life*



***Save Lives***



***Save Money***



***Save Time***

# R26 Activities

- Preservation Projects
- Technical Assistance
- MassDOT Showcase
- 4 Workshops
- Quarterly User group Conference Calls
- Peer Exchanges
- Outreach & Marketing
- **Round 7:** On-Line Trng Development; State Trng



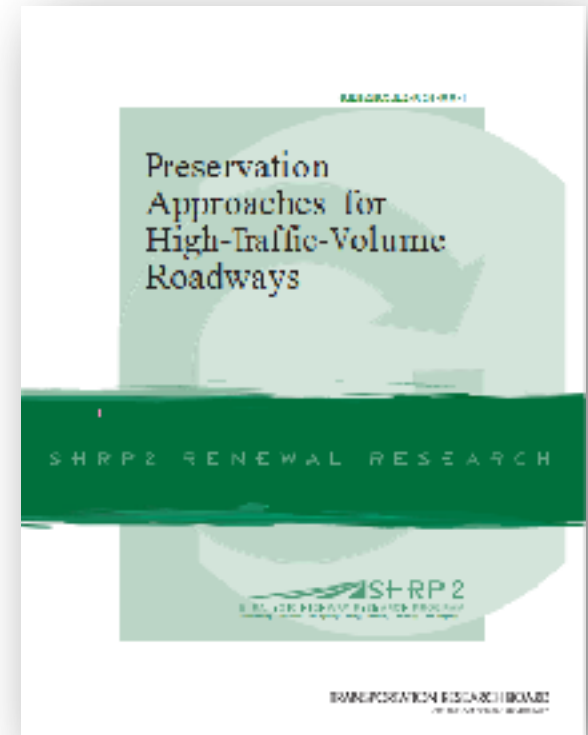
# Preservation of High-Traffic-Volume Highways (R26)

## Challenge

- *Preserving Pavements on High-Traffic-Volume Roadways* can yield significant benefits but carries a high level of risk,
- Many effective pavement preservation techniques exist, but until now they have been used, especially in urban settings, primarily for low-volume roads.

## Research Goal

- Identify and develop pavement preservation technologies that can be used to extend the life of high-traffic-volume roads and avoid disruptive and costly major rehabilitation and reconstruction projects.





Washington DOT	
Projects:	3 chip seals, 1 hot-applied seal
Roads:	2-lane rural major collector, 2-lane rural principal arterial, 2-lane rural minor arterial, and 2-lane minor arterial
Traffic:	8,000 ADT with 21 percent truck traffic on the rural collector and 4,700 to 5,800 ADT on the rural arterials
Climate Zone:	Wet/no freeze
Contacts:	Jeff Uhlmeier: <a href="mailto:uhlmeij@wsdot.wa.gov">uhlmeij@wsdot.wa.gov</a>

Minnesota DOT	
Projects:	Sponsorship of national workshop highlighting preservation treatments at the MnRoad facility
Roads:	One 4-lane rural interstate where a range of preservation treatments have been constructed, including microsurfacing, high-polymer microsurfacing, ultra-thin bonded wearing course, thin bonded and unbonded concrete overlays, and chip seals
Traffic:	26,500 ADT
Climate Zone:	Wet/freeze
Contacts:	Jerry Geib: <a href="mailto:jerry.geib@state.mn.us">jerry.geib@state.mn.us</a>

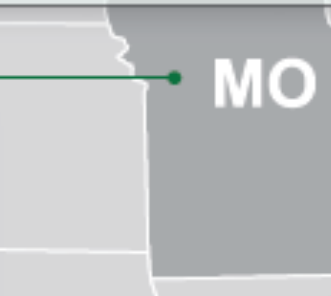
Wisconsin DOT	
Projects:	1 mill and thin HMA overlay
Roads:	4-lane divided urban primary arterial
Traffic:	19,000 ADT with 7.3 percent truck traffic
Climate Zone:	Wet/freeze
Contacts:	Jed Peters: <a href="mailto:jed.peters@dot.wi.gov">jed.peters@dot.wi.gov</a>

Missouri DOT	
Projects:	1 unbonded PCC overlay, 1 ultra-thin bonded asphalt wearing surface
Roads:	One 4- to 3-lane urban arterial, 2-lane rural minor arterial, 4-lane rural arterial
Traffic:	9,000 ADT on the urban arterial, and 7,000 to 9,000 ADT on the rural arterials
Climate Zone:	Wet/freeze
Contacts:	Jennifer Harper: <a href="mailto:jennifer.harper@modot.mo.gov">jennifer.harper@modot.mo.gov</a> William Stone: <a href="mailto:william.stone@modot.mo.gov">william.stone@modot.mo.gov</a> Steve Engelbrecht: <a href="mailto:steven.engelbrecht@modot.mo.gov">steven.engelbrecht@modot.mo.gov</a>

Pennsylvania DOT	
Projects:	2 thin HMA overlays, 1 microsurfacing
Roads:	4-lane rural collectors, 2-lane rural minor arterial
Traffic:	11,300 to 11,600 ADT on the rural collectors with 8 to 9 percent truck traffic, 1,350 ADT and 9 percent truck traffic on the rural minor arterial
Climate Zone:	Wet/freeze
Contacts:	Steven Koser: <a href="mailto:skoser@pa.gov">skoser@pa.gov</a> Neil Leibig: <a href="mailto:nleibig@pa.gov">nleibig@pa.gov</a>

District of Columbia DOT	
Projects:	2 microsurfacing
Roads:	2-lane urban collectors, 4-lane urban collector
Traffic:	10,500 ADT
Climate Zone:	Wet/freeze
Contacts:	Aaron Horton: <a href="mailto:aaron.horton@dc.gov">aaron.horton@dc.gov</a> Wolde Makonnen: <a href="mailto:wolde.makonnen@dc.gov">wolde.makonnen@dc.gov</a>

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 reclaimite asphalt rejuvenator



## SHRP2 R26 Project Analysis Tool

This analytical tool is intended to be used to identify feasible pavement preservation projects on high-traffic-volume roads and to select the preferred preservation treatment for each project based on the conditions and characteristics of the project, the cost effectiveness of the treatment, and various other selection factors. It complements the guidance provided in the R26 publication, "Guidelines for the Preservation of High Traffic Volume Roadways." This tool is designed for use by pavement maintenance/preservation engineers, pavement management engineers, and other pavement practitioners responsible for making preservation decisions.

### Getting

This analytical tool is divided into four different modules that are introduced below and accessed from the buttons on the right.

#### Project Analysis

The purpose of this tool is to apply the R26 treatment selection methodology to a pavement project, in order to determine appropriate treatments for that project. Click the 'Project Analysis' button to enter information for a specific pavement project, to apply the R26 methodology, and to determine recommended treatments for your project.

Project Analysis

#### Treatment Toolkit Setup and Management

Treatment 'toolkits' are user-defined sets of selected preservation treatments, and their associated estimated performance and unit costs. Click the 'Toolkit Setup and Management' button to create a list of unique pavement preservation treatments for use in your project analysis. Note that each defined pavement preservation toolkit is specific to one of three pavement types: flexible, rigid, or

Treatment Toolkit  
Setup and  
Management

#### Included Pavement Performance Measures

When conducting a project analysis, you may only want to include certain performance measures (e.g., only certain distresses) in your analysis. Click the 'Included Pavement Performance Measures' button to set the specific performance measures to be used for each pavement type.

Included Pavement  
Performance Measures

#### Resources

Click the 'Resources' button to access many useful R26-related references to help you with the development of pavement preservation toolkits, and associated project analyses.

Resources



## Project Analysis: Section Selection

## Section Selection

Back

The first step of the section analysis is to add a new section or open an existing section. Use the controls below in the 'Section List' area to 'Add,' 'Copy,' 'Delete,' and organize sections in the section list. To run an analysis on a particular section, select that section in the section list and click the 'Next' button.

Next

## Section List

Pavement Type: Flexible

## Section List

Default Flexible Section

Copy

Move Up

Add

Move Down

Delete

## Section Details

Section Name: Default Flexible Section

## Section Details: Default Flexible Section

## General Information

Highway Route / Road Name: 0

Location (City/County): 0

Limits (Begin/End Mileposts or Reference Points)

Begin: 0.00

End: 0.00

Section Length, miles: 0.00

Num. Lanes In Each Direction: 0

## Pavement Type and Structure

Pavement Type:

Flexible Pavement (HMA surface on aggregate or stabilized base)

Pavement Structure:

HMA Overlay of Flexible Pavement

## Construction/Rehab Information

Last Construction Year (i.e., year original pavement was built or last rehabilitate): 2000

Year that Preservation Treatment is Expected to be Applied: 2008

## Traffic Information

2-way Avg. Daily Traffic (ADT), veh/day: 0

Percentage of Trucks In ADT, %: 0.0

Setting/Environment: Rural

## Environmental Information

Is the Pavement Section located in a Noise-Sensitive Area: No

Edit Section  
Details

## Toolkit Selection

The next step of the project analysis process is to select an available "toolkit" that contains the treatments that you want to consider for application on your project. The list of available pavement type-specific toolkits is shown below. Please select your desired toolkit from the list and click the "Next" button to continue the analysis process. If you need to define a new toolkit, use the provided "Add" or "Copy" list control buttons.

### Toolkit List

Pavement Type **Flexible**

Toolkit List
R26 Default - Flexible
<b>HMA 7</b>
HMA 12
New

### Toolkit Details: HMA 2

Included?	Treatment Type	Performance, yrs	In-Place Cost
<input checked="" type="checkbox"/>	Crack Fill	2.5	\$0.65 /ft
<input checked="" type="checkbox"/>	Crack Seal	4.0	\$1.10 /ft
<input type="checkbox"/>	Slurry Seal (Type III)	4.0	\$0.83 /sf
<input type="checkbox"/>	Microsurfacing (Single-Course)	4.0	\$2.25 /sf
<input type="checkbox"/>	Microsurfacing (Double-Course)	5.0	\$4.25 /sf
<input type="checkbox"/>	Chip Seal (Single-Course, Conv. Binder)	5.0	\$1.75 /sf
<input checked="" type="checkbox"/>	Chip Seal (Single-Course, Poly. Binder)	6.0	\$3.00 /sf
<input checked="" type="checkbox"/>	Chip Seal (Double-Course, Conv. Binder)	7.0	\$3.25 /sf
<input checked="" type="checkbox"/>	Chip Seal (Double-Course, Poly. Binder)	8.5	\$4.50 /sf
<input checked="" type="checkbox"/>	Ultrathin Bonded Wearing Course	6.5	\$5.00 /sf
<input checked="" type="checkbox"/>	Ultrathin HMA Overlay	5.5	\$2.50 /sf
<input checked="" type="checkbox"/>	Thin HMA Overlay	7.5	\$4.50 /sf
<input checked="" type="checkbox"/>	Mill and Thin HMA Overlay	8.5	\$7.50 /sf
<input checked="" type="checkbox"/>	HIR-I (Surface Recycling)	6.5	\$2.50 /sf
<input checked="" type="checkbox"/>	HIR-II (Remixing)	9.0	\$4.50 /sf
<input checked="" type="checkbox"/>	HIR-III (Repeving)	9.0	\$5.25 /sf
<input checked="" type="checkbox"/>	CIR	8.0	\$2.50 /sf
<input checked="" type="checkbox"/>	Profile Milling	3.0	\$0.00 /sf
<input checked="" type="checkbox"/>	Ultrathin Whitetopping	0.0	\$20.00 /sf

Threshold PCI (trigger for rehabilitation) 40

(note: the Threshold PCI value is used for all treatment

## Project Analysis: Analysis Type

## Analysis Type

[Back](#)

The next step is to choose the analysis type. Click the button below that matches the analysis type you want to

### Project and Treatment Selection

To perform a full analysis involving both project selection (i.e., is preservation a feasible strategy for a particular pavement section?) and treatment selection (i.e., which preservation treatment is the preferred option for the pavement section), click on the "Project and Treatment Selection" button.

[Project and Treatment Selection](#)

### Treatment Selection Only

If a decision has already been made that a pavement section should receive a preservation treatment, but an evaluation of which treatment to select for the pavement is needed, click on the "Treatment Selection Only" button.

[Treatment Selection Only](#)

## Project Analysis: Pavement Condition Definition

### Flexible Pavement Overall Condition/Performance

Back

Enter overall condition/performance data for the pavement section for the expected year of the preservation treatment. Use historical FMS data, field survey data, or both to develop inputs that best reflect the pavement conditions at the time the treatment is expected to be applied. Click on the 'Next' button to

Next

#### Overall Pavement Condition:

Pavement Condition Index

#### Structural Distress:

Condition Measure	Input Description	Input
Rutting	Is average rutting > 0.5 in and primarily unstable (i.e., [a] lack of structural support in base, subbase, and/or subgrade or [b] lateral displacement of unstable HMA mix layers)?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Potholes and Deteriorated Patches	Is combined surface area of potholes and medium- to high-severity deteriorated patches > 5%?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Fatigue Cracking	Is combined wheelpath surface area containing medium- and high-severity alligator cracking and/or longitudinal wheelpath cracking > 10%?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Heaves/Swells and Depressions	Is combined surface area containing medium- and high-severity heaves/swells and/or depressions (due to lack of structural support) > 5%?	<input type="radio"/> Yes <input checked="" type="radio"/> No

#### Pavement Surface Characteristics:

Condition Measure	Input Description	Input
International Roughness Index (IRI)	IRI determined using standard ????	<input type="text" value="100"/> in/mi
Friction Number	Friction Number obtained using locked wheel skid trailer operated at 40 mi/hr and using a smooth test tire (HN4CS), ASTM E274.	<input type="text" value="50"/> FN
Pavement tire noise	Pavement tire noise in terms of On Board Sound Intensity (OBSI), ASTM WK26025/PASHTO TP 76 10.	<input type="text" value="50"/> dBA

#### Other Parameters:

Condition Measure	Input Description	Input
Materials-related distress (MRD)	Are there notable signs of MRD (e.g., asphalt stripping, tender mix) throughout the pavement section?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Surface layer delamination	Is surface area of delaminated/delaminated HMA layer(s) > 5%?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Drainage issues	Are there notable signs of drainage problems (e.g., pumping, clogged underdrains) throughout the pavement section?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Nondestructive deflection testing (NDT) issues	Has NDT testing shown high deflections, indicating significant areas of weak pavement?	<input type="radio"/> Yes <input checked="" type="radio"/> No



## Project Analysis

### List of Candidate Treatments

Based on the entered detailed condition information, the R26 methodology was used to assess the applicability of treatments for the current pavement section. Recommended treatments are those that meet R26 PCI and Age 'window of opportunity' requirements, and have a computed score  $\geq 2.0$ . Use the provided check boxes to select treatments you want to consider for the current section. Click the 'Next' button to further evaluate the feasibility of your

#### Candidate Treatment List:

Section PCI: 75

Section Age: 8 years

Treatment Type	R26 PCI Range	R26 PCI Check	R26 Age Range, yrs	R26 Age Check	R26 Distress Score	R26 Distress Score $\geq 2.0$ ?	Treatment Recommendation	Include?
Mill-and-Thin HMA Overlay	60 to 75	PASS	7 to 12	PASS	2.20	YES	RECOMMENDED	<input checked="" type="checkbox"/>
HIR-III (Repeving)	60 to 75	PASS	7 to 12	PASS	2.20	YES	RECOMMENDED	<input checked="" type="checkbox"/>
GIR	60 to 75	PASS	7 to 12	PASS	2.20	YES	RECOMMENDED	<input checked="" type="checkbox"/>
Chip Seal (Double-Course, Conv. Binder)	70 to 85	PASS	5 to 8	PASS	2.00	YES	RECOMMENDED	<input checked="" type="checkbox"/>
Chip Seal (Double-Course, Poly. Binder)	70 to 85	PASS	5 to 8	PASS	2.00	YES	RECOMMENDED	<input checked="" type="checkbox"/>
Thin HMA Overlay	60 to 80	PASS	5 to 12	PASS	2.00	YES	RECOMMENDED	<input checked="" type="checkbox"/>
HIR-II (Remixing)	60 to 75	PASS	7 to 12	PASS	2.00	YES	RECOMMENDED	<input checked="" type="checkbox"/>
HIR-I (Surface Recycling)	70 to 85	PASS	5 to 8	PASS	1.80	NO	POSSIBLE	<input type="checkbox"/>
Chip Seal (Single Course, Poly. Binder)	70 to 85	PASS	5 to 8	PASS	1.60	NO	POSSIBLE	<input type="checkbox"/>
Ultrathin Bonded Wearing Course	65 to 85	PASS	5 to 10	PASS	1.60	NO	POSSIBLE	<input type="checkbox"/>
Ultrathin HMA Overlay	65 to 85	PASS	5 to 10	PASS	1.60	NO	POSSIBLE	<input type="checkbox"/>
Ultrathin Whitetopping	60 to 80	PASS	5 to 12	PASS	1.20	NO	POSSIBLE	<input type="checkbox"/>
Crack Fill	75 to 90	PASS	3 to 6	FAIL	0.20	NO	POSSIBLE	<input type="checkbox"/>
Profile Milling	80 to 90	FAIL	3 to 6	FAIL	1.60	NO	NOT RECOMMENDED	<input type="checkbox"/>
Crack Seal	80 to 95	FAIL	2 to 5	FAIL	0.60	NO	NOT RECOMMENDED	<input type="checkbox"/>
Slurry Seal (Type III)	70 to 85	PASS	5 to 8	PASS	-	-	NOT INCLUDED	
Microsurfacing (Single-Course)	70 to 85	PASS	5 to 8	PASS	-	-	NOT INCLUDED	
Microsurfacing (Double-Course)	70 to 85	PASS	5 to 8	PASS	-	-	NOT INCLUDED	
Chip Seal (Single-Course, Conv. Binder)	70 to 85	PASS	5 to 8	PASS	-	-	NOT INCLUDED	

Back

Next



## Project Analysis

## Treatment Cost Effectiveness Computation Approach

Specify which approach to use to evaluate the cost effectiveness of the candidate preservation treatments. Click on the 'Next' button to proceed with the cost effectiveness evaluation.

### Equivalent Annual Cost (EAC)

This approach involves a simple calculation of the treatment in-place cost divided by the expected treatment performance (i.e., pavement life extension provided by the treatment). A lower EAC signifies a more cost-effective treatment.

Equivalent Annual  
Cost (EAC)

### Benefit-Cost Ratio (BCR)

This more detailed approach considers both the long-term benefits and costs associated with using a particular treatment. The Performance Benefit (PB) is quantified by computing the area under the pavement performance curve, while the cost is computed as a Net Present Value (NPV) life-cycle cost. The BCR is then computed by dividing the benefit by the life-cycle cost. A higher BCR signifies a more cost-effective treatment.

Benefit-Cost Ratio  
(BCR)

$$BCR = PB / NPV (\$)$$

## Project Analysis

## Selection of Preferred Treatment Alternative - Decision Factor

Identify the decision factors to be used in determining the preferred treatment, and specify the level of importance weightings for those factors. Note that the sum of the 'category weighting' values must equal 100%. The individual 'factor' weightings within each included category must also equal 100%.

Back

Next

Category	Category Weighting	Factor	Factor Weighting
<input checked="" type="checkbox"/> Economic Factors	<input type="text" value="0"/> %	<input checked="" type="checkbox"/> Initial Cost	<input type="text" value="0"/> %
		<input checked="" type="checkbox"/> Cost Effectiveness	<input type="text" value="0"/> %
		<input checked="" type="checkbox"/> Agency Cost	<input type="text" value="0"/> %
		<input checked="" type="checkbox"/> User Cost	<input type="text" value="0"/> %
		<input type="checkbox"/> <input type="text" value=""/>	<input type="text" value="0"/> %
		Total Factor Weighting:	0 %
<input checked="" type="checkbox"/> Construction/Materials	<input type="text" value="0"/> %	<input type="checkbox"/> Availability of Qualified Contractors	<input type="text" value="0"/> %
		<input type="checkbox"/> Availability of Quality Materials	<input type="text" value="0"/> %
		<input type="checkbox"/> Conservation of Materials/Energy	<input type="text" value="0"/> %
		<input type="checkbox"/> Weather Limitations	<input type="text" value="0"/> %
		<input type="checkbox"/> <input type="text" value=""/>	<input type="text" value="0"/> %
		Total Factor Weighting:	0 %
<input checked="" type="checkbox"/> Customer Satisfaction	<input type="text" value="0"/> %	<input checked="" type="checkbox"/> Traffic Disruption	<input type="text" value="0"/> %
		<input checked="" type="checkbox"/> Safety Issues	<input type="text" value="0"/> %
		<input checked="" type="checkbox"/> Ride Quality and Noise Issues	<input type="text" value="0"/> %
		<input type="checkbox"/> <input type="text" value=""/>	<input type="text" value="0"/> %
		Total Factor Weighting:	0 %
<input checked="" type="checkbox"/> Agency Policy/Preference	<input type="text" value="0"/> %	<input type="checkbox"/> Continuity of Adjacent Pavements	<input type="text" value="0"/> %
		<input type="checkbox"/> Continuity of Adjacent Lanes	<input type="text" value="0"/> %
		<input type="checkbox"/> Local Preference	<input type="text" value="0"/> %
		<input type="checkbox"/> <input type="text" value=""/>	<input type="text" value="0"/> %
		Total Factor Weighting:	0 %
Total Category Weighting:			0 %

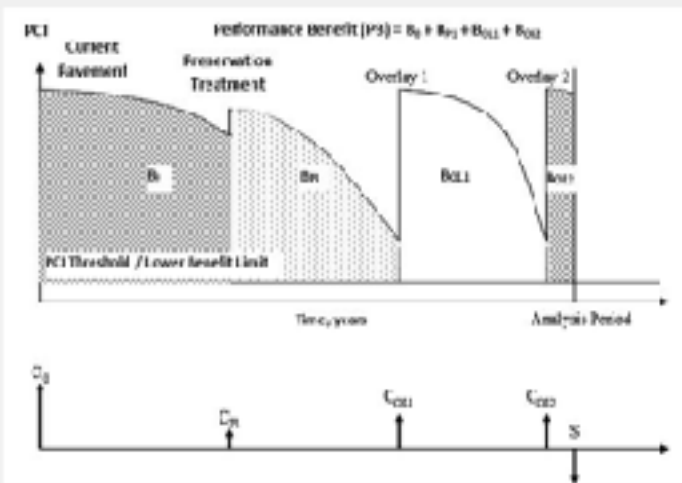
Project Analysis

### BCR - Performance Definition of Current Pavement and Future Rehabilitation

Using the chosen analysis period and the following figure as a guide, define the life-cycle performance model of the pavement, focusing on the current pavement and future rehabilitation. Also, enter the estimated construction cost of the current pavement and the estimated construction cost of future rehabilitation treatments. Click on the 'Next' button to continue with the analysis setup.

#### Illustration of Benefit/Cost Analysis Details

The following figure is figure 3.3 from the R26 Report. It illustrates the benefits and costs associated with a pavement preservation treatment strategy. Use this figure as a reference while filling out inputs (at the right) associated with the current pavement section.



#### Current Pavement Information Inputs

1. Year current pavement was constructed (previously defined):
2. Established/specified 'Threshold PCI' (from Toolkit definition):
3. Year original pavement will reach 'Threshold PCI' (i.e., year rehab is expected):
4. Year preservation treatment is expected to be applied (previously defined):
5. Estimated PCI of current pavement at time of preservation treatment (previously defined):
6. PCI of Rehabilitated Pavement at Time of Rehabilitation (assumed 100):
7. Expected performance of rehabilitation treatment (years until PCI drops to user-specified 'Threshold PCI'), years:
8. Estimated construction cost of rehabilitation treatment, \$:

File Home Insert

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Home Outp

Ready

Windows taskbar with icons for Internet Explorer, File Explorer, Google Chrome, and other applications.

# Benefit Calculator

## Easy Data Requirements

---

1. Inventory = Total centerline miles or lane miles
2. Condition Assessments – Excellent, Good, Fair and Poor
3. Annual Budget –
  - \$ for Preventive Maintenance
  - \$ for Rehabilitation
  - \$ for Reconstruction

# Budget Input

---

Treatment Strategy	Budget
Preventive Maintenance	\$
Rehabilitation	\$
Reconstruction	\$



# Easy Data Requirements

---

1. Inventory = Total centerline miles or lane miles
2. Condition Assessments – Excellent, Good, Fair and Poor
3. Annual Budget –
  - \$ for Preventive Maintenance
  - \$ for Rehabilitation
  - \$ for Reconstruction

# Budget Input

---

Treatment Strategy	Budget
Preventive Maintenance	\$
Rehabilitation	\$
Reconstruction	\$

# Scenario Analysis

---

## Pavement Preservation

Condition	Budget
Total	1,000,000
	-
Prev. Maint. \$	600,000
Rehab \$	200,000
Reconstruction \$	200,000

## Worst First

Condition	Budget
Total	1,000,000
	-
Prev. Maint. \$	-
Rehab \$	200,000
Reconstruction \$	800,000

# 10-Year Results

## Pavement Condition

### Pave Preserv:

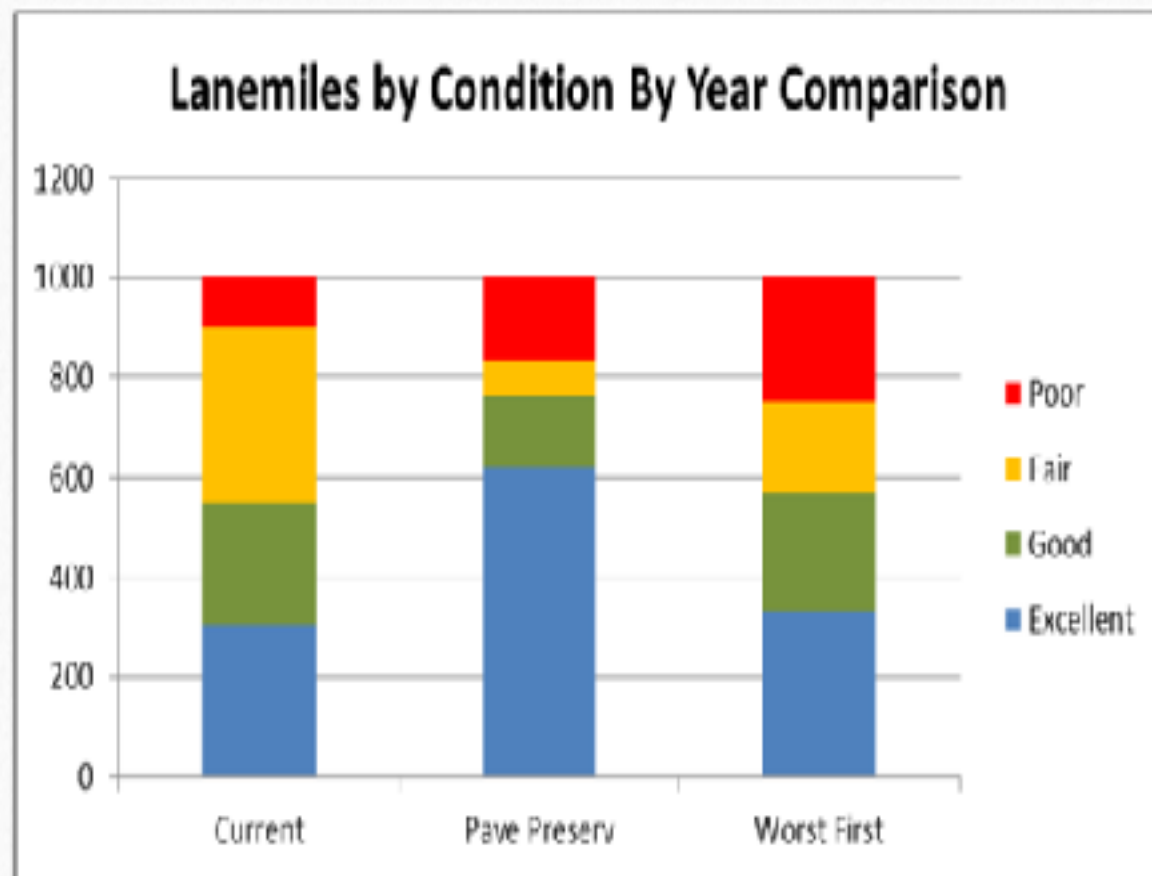
Excellent +208%

Poor +63%

### Worst First:

Excellent +32%

Poor +249%



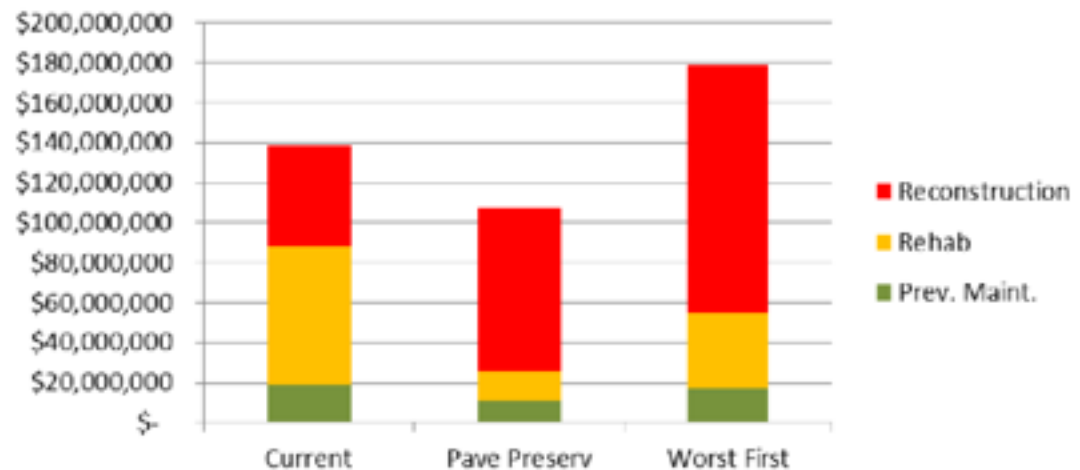
# 10-Year Results

## Backlog Comparison

Pave Preserv - 23%

Worst First +29%

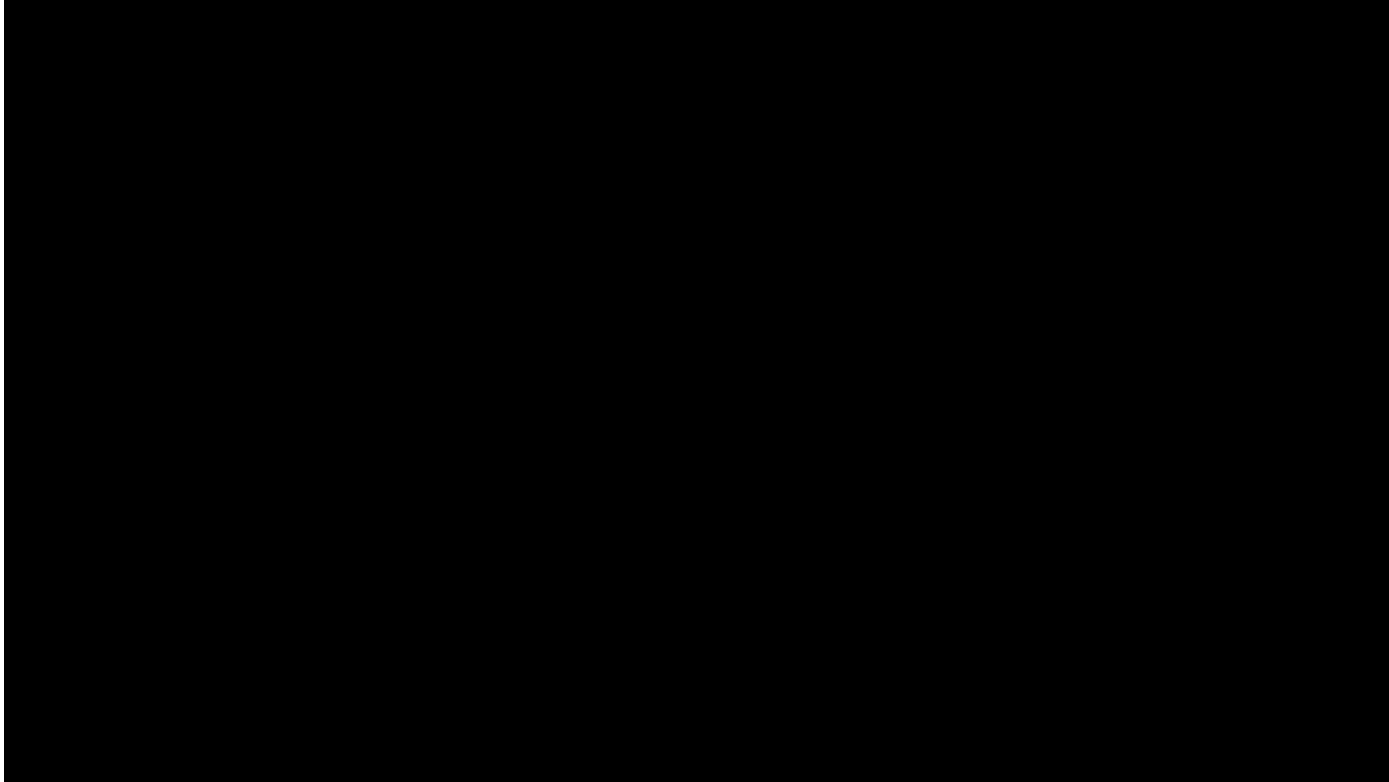
Backlog by Work Category Comparison





# ODOT Communication Plan

<https://www.youtube.com/watch?v=B6jZJQBvpc0#t=12>



# Challenges

- Shifting from a worst-first strategy when funding is tight
  - Agencies tend to fight fires
- Availability of qualified contractors, strong construction practices, & good candidates for preservation treatments
- Quantifying the benefits to pavement preservation
  - Lack of adequate distress information
  - Inconsistency in terminology
  - Inconsistencies in treatment use



U.S. Department  
of Transportation  
Federal Highway  
Administration

Center for Accelerating Innovation



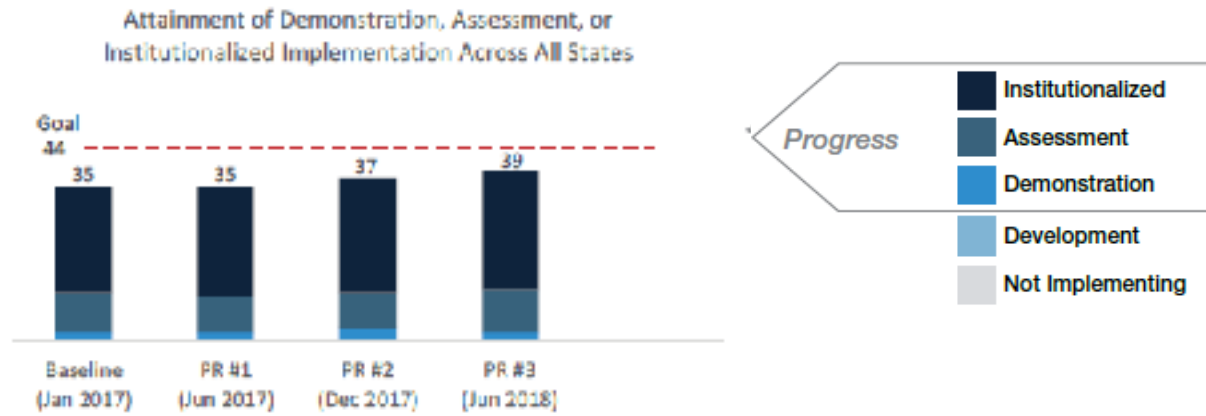
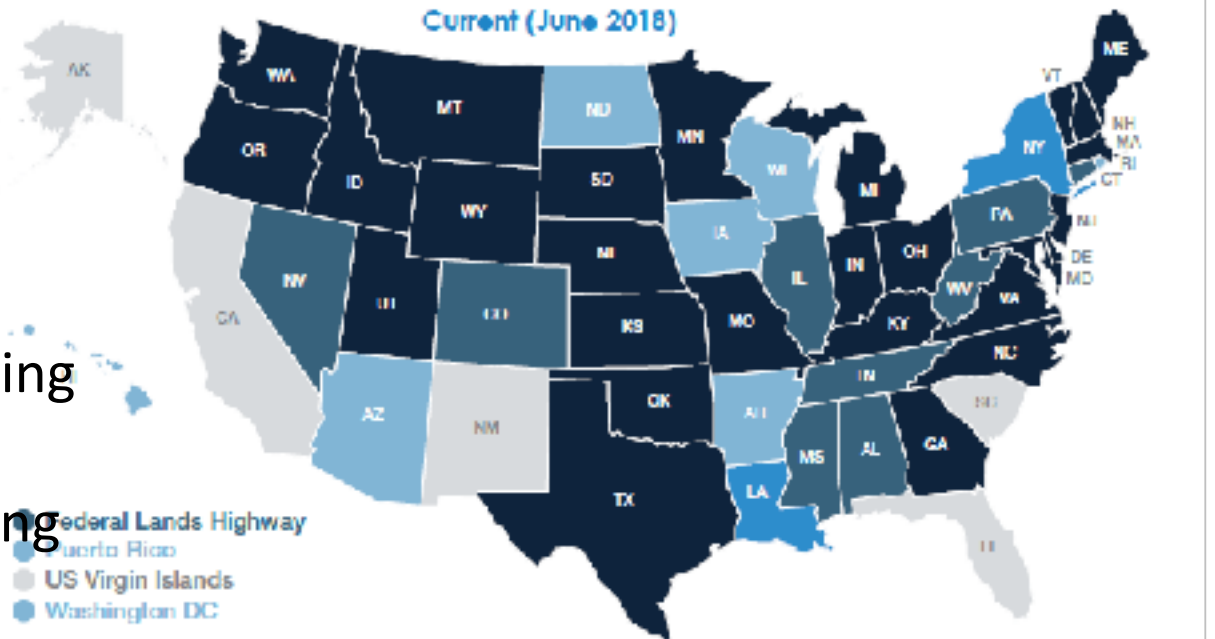
*On-Ramp to  
Innovation*  
every day counts

## EDC-4 Pavement Preservation: How

Focuses upon Quality Construction and  
Materials Practices of pavement preservation  
treatments.

# National Goal

Ensure **States or local agencies** will be using revised treatment specifications, training construction and inspection personnel, using new construction materials, and/or adopting improved pavement preservation construction practice.



# Pavement Preservation: How Quality Construction and Materials

## Flexible Pavements

- Micro surfacing
- Chip Seal
- Slurry Seal/Scrub Seal
- Ultrathin bonded wearing course



## Rigid Pavements

- Diamond grinding
- Partial-depth repair
- Full-depth repair
- Dowel bar retrofit/  
cross stitching





# Activities

- **Best Practice Technology Briefs**
  - Rigid-surfaced: Missouri DOT (complete)  
<https://www.fhwa.dot.gov/pavement/preservation/resources.cfm>
  - Flexible-surfaced: Nevada DOT (complete)  
<https://www.nevadadot.com/home/showdocument?id=14560>
- **Regional Pavement Preservation Partnership Workshops (3 complete and 1 more for MPPP next month)**
- **Peer-to-Peer Exchanges / Update Database and Share Specifications (2 complete and 9 more being scheduled)**
- ***Update Pavement Preservation Checklist (Winter 2018)***
  - *Add video for common inspection tasks*
  - *Create app for table and smart phone functionality*

# Best Practice Technology Briefs

the [Innovation Library page](#). The direct links are below.

Date	Rept no.	Title of Report	Proj. no.
2017-11	<a href="#">cmr 17-013</a> <a href="#">cmr 17-013 (TB1)</a> <a href="#">cmr 17-013 (TB2)</a> <a href="#">cmr 17-013 (TB3)</a> <a href="#">cmr 17-013 (TB4)</a> <a href="#">cmr 17-013 (TB5)</a> <a href="#">cmr 17-013 (TB6)</a>	<b>Concrete Repair Best Practices: A Series of Case Studies</b> <i>Final report (2.2 MB, 119 pages)</i> <i>Technical Brief #1. Cross-Stitching (600 kB, 5 pages)</i> <i>Technical Brief #2. Dowel Bar Retrofit (662 kB, 6 pages)</i> <i>Technical Brief #3. Diamond Grinding (654 kB, 5 pages)</i> <i>Technical Brief #4. Full Depth Repair (647 kB, 6 pages)</i> <i>Technical Brief #5. Partial Depth Repair (585 kB, 6 pages)</i> <i>Technical Brief #6. Slab Stabilization (604 kB, 5 pages)</i>	TR201618

Chip seal, slurry seal, micro surfacing, and thin lift asphalt overlay construction quality assurance best practices are nearly complete and documents should be available in the next few months. Please let me know if you have any questions.

<http://www.modot.org/services/or/byDate.htm>

# Free PP Web-based Training

## FHWA/ISSA partnership

- Flexible surfaced
  - Chip Seal, Micro Surfacing, Slurry Seal Boxes

[http://slurry.org/Docs/WBTPhase1/ISSA\\_WBT\\_Login\\_Instructions.pdf](http://slurry.org/Docs/WBTPhase1/ISSA_WBT_Login_Instructions.pdf)

## NHI 134207 Courses (**coming soon**)

- Rigid surfaced
  - PDR, Dowel Bar Retrofit, Diamond Grinding, Cross-Stitching, Joint Sealing

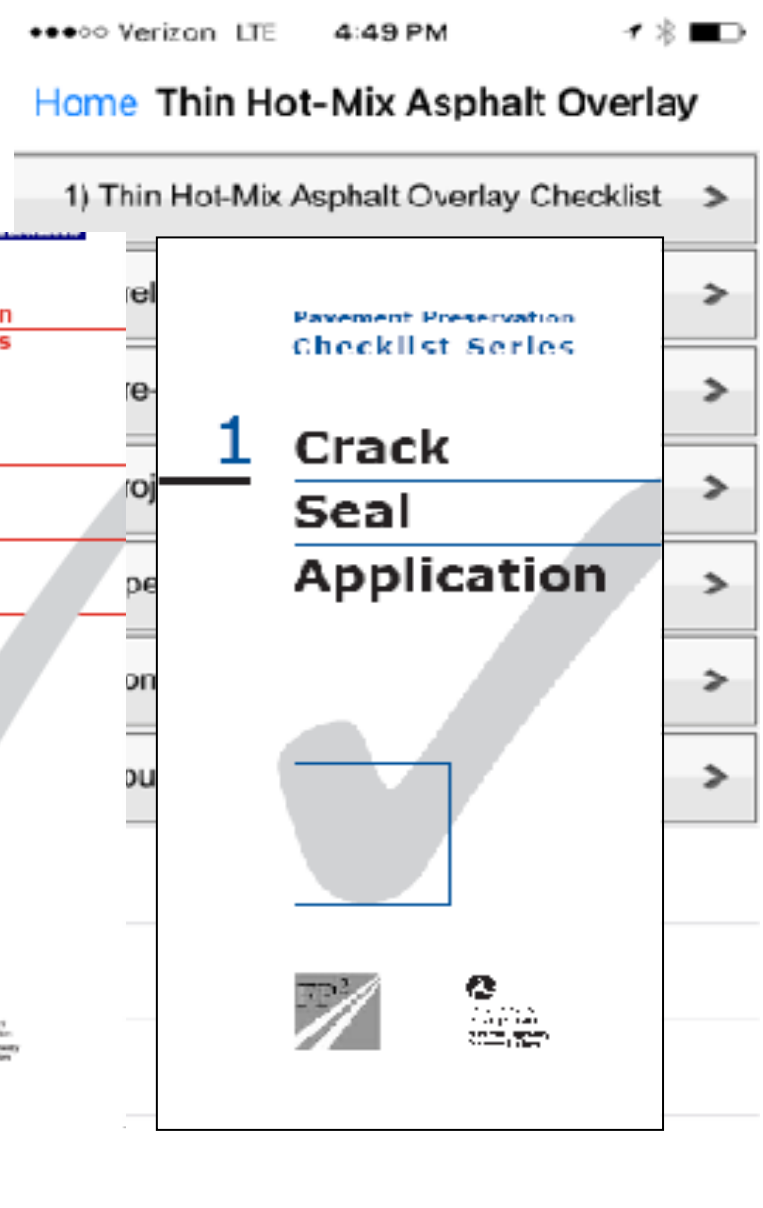
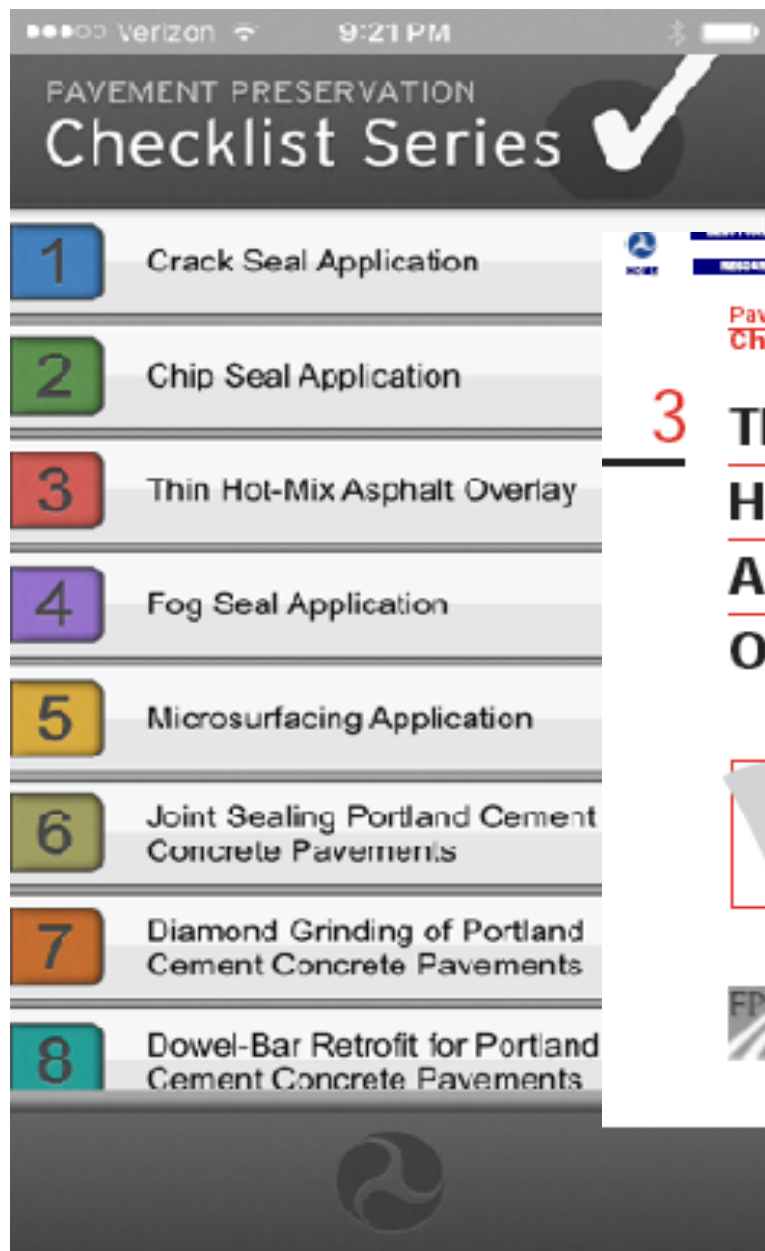
# EDC-4 Resources

[https://www.fhwa.dot.gov/innovation/everydaycounts/edc\\_4/](https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/)



Every Day Counts:  
An Innovation Partnership With States

*EDC-4 Progress Report #2*  
July–December 2017





# Existing Asphalt Checklists

- Inspection Checklist #01 Crack Seal Application
- Inspection Checklist #02 Chip Seal Application
- Inspection Checklist #03 Thin Hot Mix Application
- Inspection Checklist #04 Fog Seal Application
- Inspection Checklist #05 Micro Surfacing Application
- Inspection Checklist #11 Hot In-Place Asphalt Recycling Application
- Inspection Checklist #12 Cold In-Place Asphalt Recycling
- Inspection Checklist #13 Slurry Seal Application Checklist
- Inspection Checklist #14 Fabric Interlayer Application
- Inspection Checklist #15 Full Depth Reclamation



# Existing Concrete Checklists

- Inspection Checklist #06 Joint Sealing Portland Cement Concrete Pavements
- Inspection Checklist #07 Diamond Grinding of Portland Cement Concrete Pavements
- Inspection Checklist #08 Dowel-Bar Retrofit of Portland Cement Concrete Pavements
- Inspection Checklist #09 Partial-Depth Repair of Portland Cement Concrete Pavement
- Inspection Checklist #10 Full-Depth Repair of Portland Cement Concrete Pavements



# Modernizing Checklist Series

- App based
- Phone
- Tablet
- Print
- Link to supporting document
- See if can link to AASHTO e document
- Accept photos
- Brief videos



# Six Asphalt Checklists

- Tack Coat
- Scrub Seal
- Patching
- High Friction Surface Treatment
- Cap Seals
- Ultrathin Bonded Wearing Course



- These are in addition to the existing 10 checklists

# Two Concrete Checklists

- Cross-Stitching
- Grooving



These are in addition to the existing 5 checklists

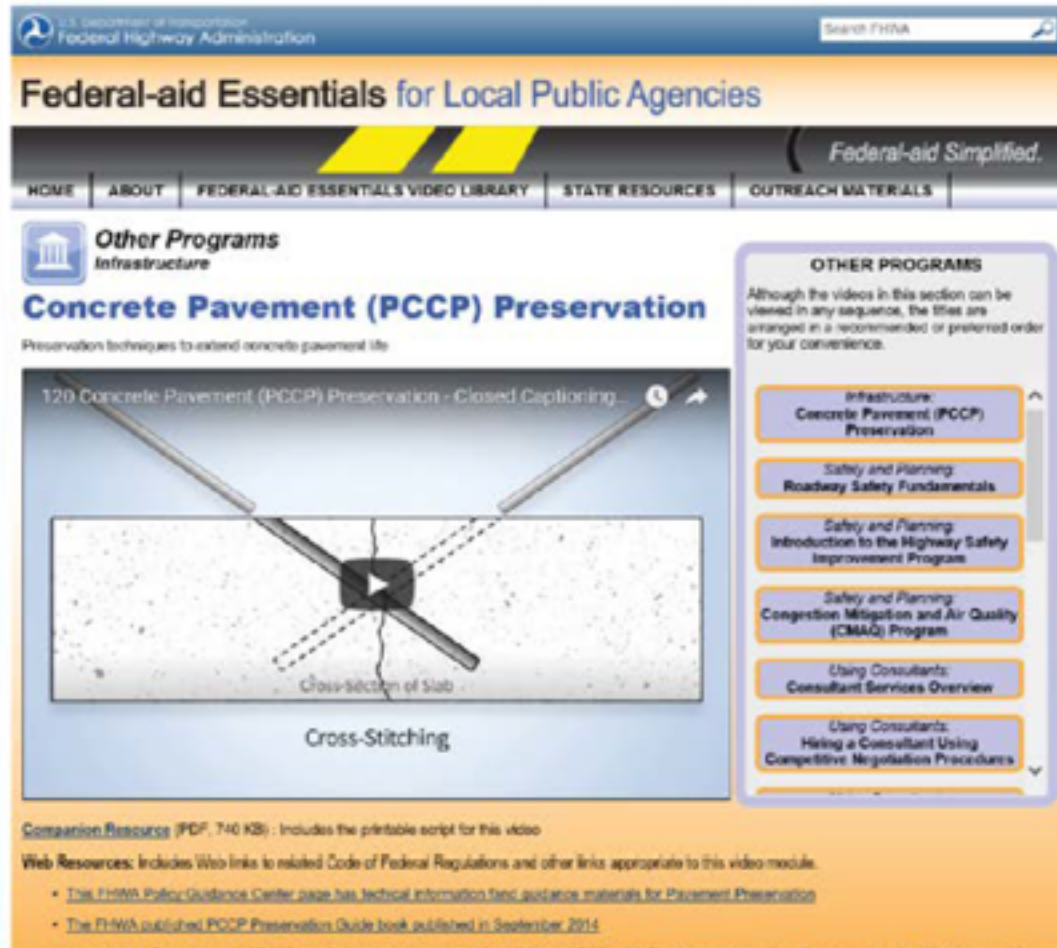


# AASHTO Standards Developed or Under Development

- Chip Seal – 2015
- Micro Surfacing – 2015
- Tack Coat – 2018
- Fog Seal – 2017
- Scrub Seal – 2018
- Sand Seal – 2018
- Slurry Seal – 2017
- Foam Asphalt Stabilization – 2018
- Thin Bonded Wearing Courses – 2018
- Cold Mixes
  - Virgin
  - Recycled
  - CIR - 2017

# Innovation Spotlight

<https://www.fhwa.dot.gov/federal-aidessentials/catmod.cfm?id=120>



The screenshot displays the Federal Highway Administration's "Federal-aid Essentials for Local Public Agencies" website. The main content area features a video player titled "120 Concrete Pavement (PCCP) Preservation - Closed Captioning...". Below the video player is a diagram labeled "Cross-Stitching" showing a cross-section of a concrete slab with a crack and a repair. To the right of the video player is a sidebar titled "OTHER PROGRAMS" containing a list of video modules: "Infrastructure: Concrete Pavement (PCCP) Preservation", "Safety and Planning: Roadway Safety Fundamentals", "Safety and Planning: Introduction to the Highway Safety Improvement Program", "Safety and Planning: Congestion Mitigation and Air Quality (CMAQ) Program", "Using Consultants: Consultant Services Overview", and "Using Consultants: Hiring a Consultant Using Competitive Negotiation Procedures".

**Other Programs**  
Infrastructure

## Concrete Pavement (PCCP) Preservation

Preservation techniques to extend concrete pavement life

120 Concrete Pavement (PCCP) Preservation - Closed Captioning...

Cross-Section of Slab

Cross-Stitching

**OTHER PROGRAMS**

Although the videos in this section can be viewed in any sequence, the titles are arranged in a recommended or preferred order for your convenience.

- Infrastructure: Concrete Pavement (PCCP) Preservation
- Safety and Planning: Roadway Safety Fundamentals
- Safety and Planning: Introduction to the Highway Safety Improvement Program
- Safety and Planning: Congestion Mitigation and Air Quality (CMAQ) Program
- Using Consultants: Consultant Services Overview
- Using Consultants: Hiring a Consultant Using Competitive Negotiation Procedures

**Companion Resource** (PDF, 710 KB) : Includes the printable script for this video

**Web Resources:** Includes Web links to related Code of Federal Regulations and other links appropriate to this video module.

- The FHWA Policy Guidance Center page has technical information and guidance materials for Pavement Preservation
- The FHWA published PCCP Preservation Guide book published in September 2014

# ADA Questions and Answers:

[http://www.fhwa.dot.gov/civilrights/programs/ada\\_resurfacing\\_qa.cfm](http://www.fhwa.dot.gov/civilrights/programs/ada_resurfacing_qa.cfm)




# What questions do you have?





# THANK YOU!

 U.S. Department of Transportation  
Federal Highway Administration



The Office of Technical Services  
• *FHWA Resource Center*  
• *National Highway Institute*  
• *Technology Partnership Programs*

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