FHWA Initiatives

Southeast Pavement Preservation Partnership

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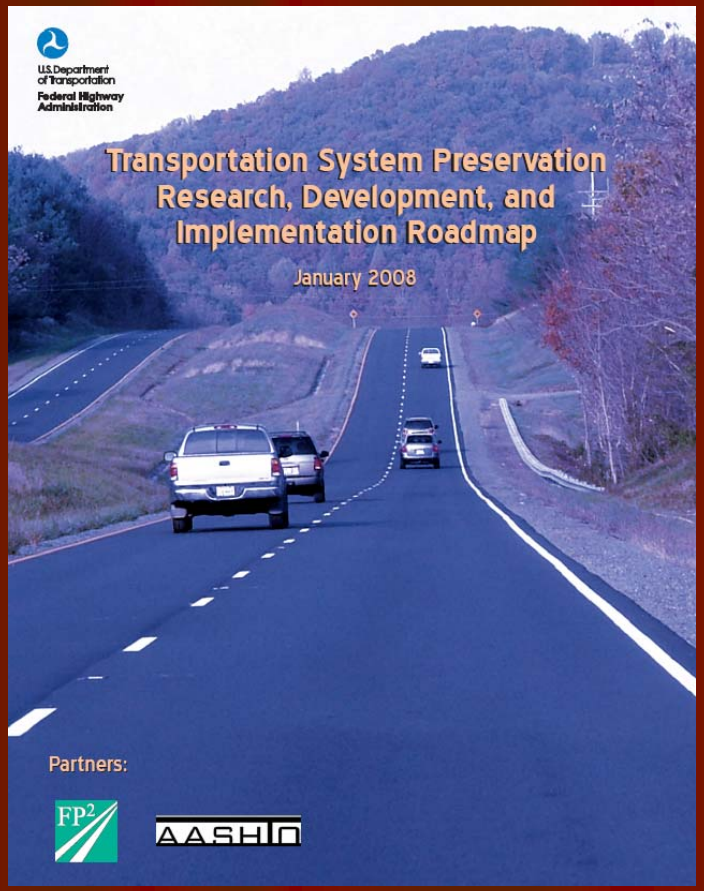
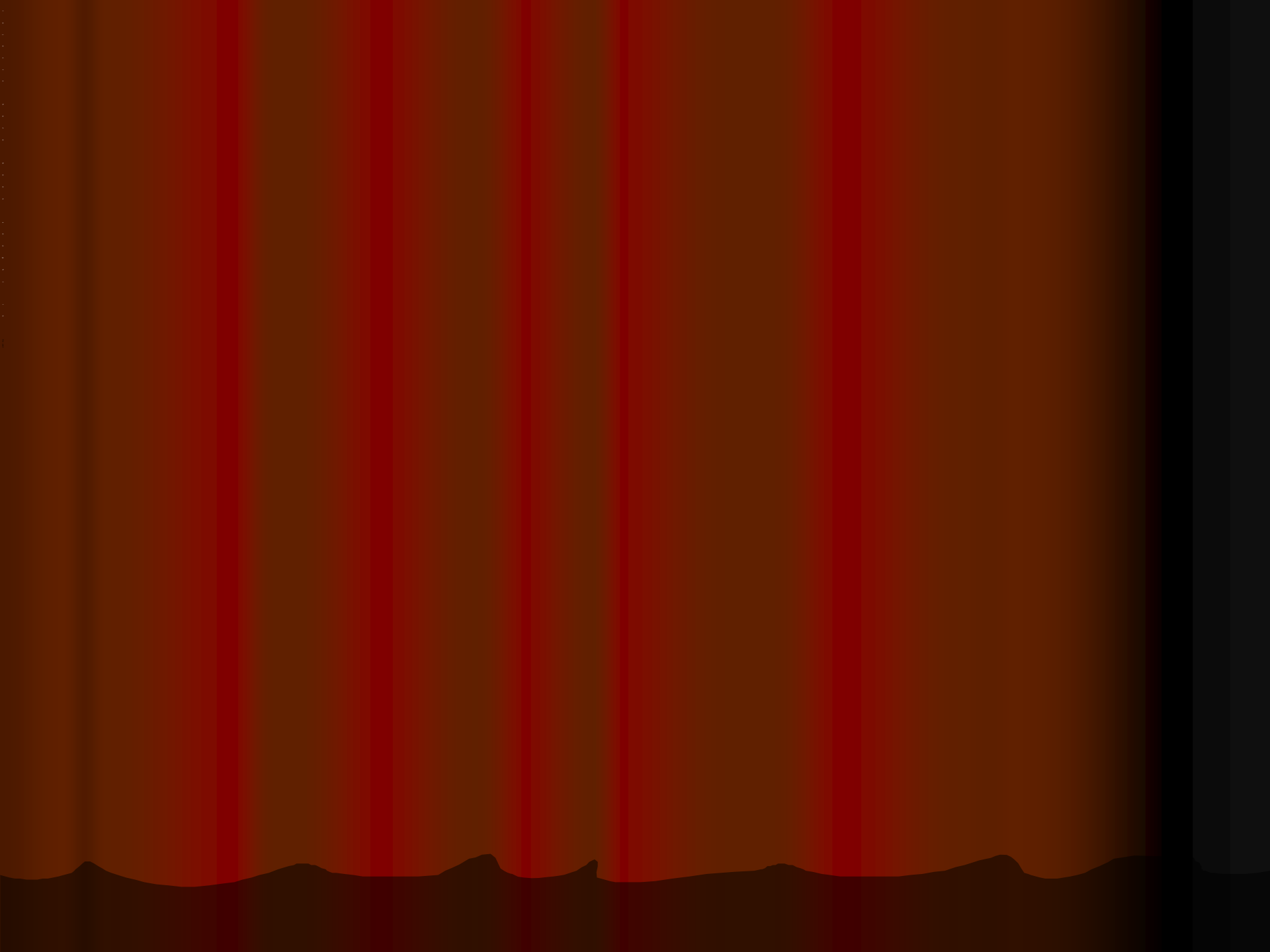
Transportation System Preservation Research Roadmap





Process

- Technical Panel
- Pavements and Bridges
- White Paper Development and Review
- 3 Workshops
  - 2 Pavements
  - 1 Bridge
  - 6 Teams

Pavements Whitepapers/ Breakouts

- Asset Management
- Design
- Materials
- Construction
- Contracting Methods
- Performance

Bridge Whitepapers/ Breakouts

- Asset Management
- Decks and Joints
- Superstructure
- Substructure
- Selection of Preservation Actions
- Performance

Process (continued)

- Research Needs Statements
  - Background
  - Scope
  - Tasks
  - Estimated Time and Cost
  - Implementations
- Balloting and Ranking
- Overall Joint Roadmap

Design # 02

Title: Determining Pavement Preservation Treatment Lives and Related Pavement Life Extension

Background: Success of a pavement preservation technique is heavily dependent on its optimal application in terms of timing and existing pavement conditions. Performance of different treatments and life extension of existing pavements due to these treatments is a function of existing pavement conditions (e.g., type, severity, and extent of distresses) and prevailing site conditions (pavement type, pavement age at the time of application, traffic, climate, etc.). There is an urgent need to develop methodologies to predict treatment performance, life extension of existing pavements and its related cost savings.

Scope/Objectives: The objective of this project is to develop methodologies to estimate treatment lives and life extension of both flexible and rigid pavements as a function of treatment type, existing pavement conditions, and environmental and traffic conditions. It is anticipated that existing databases and PMS data will be used to develop these methodologies and estimates.

Research Proposed:

The following tasks have been identified to complete the work for this project:

Task 1. Conduct a literature search and survey of transportation agencies nationally and internationally on: (1) pavement preservation techniques used for various existing pavement conditions; (2) performance curves of different pavement preservation techniques; and (3) methodologies to determine the life extension of existing pavements due to the application of pavement preservation treatments.

Task 2. Develop a family of performance curves for each pavement functional category for different pavement preservation treatment techniques used, as a function of the existing pavement, environment and traffic conditions based on findings from Task 1.

Task 3. Develop a methodology to determine the life extension of existing pavements as a function of existing pavement, environment and traffic conditions for selected treatment types.

Task 4. Develop a methodology for estimating the potential cost savings associated with selected preservation treatments given existing pavement, environment and traffic conditions on a per mile basis.

Task 5. Prepare final report.

Proposed Deliverables:

1. Performance curves of various pavement preservation techniques for each pavement functional category, environmental and traffic condition.

2. Recommend optimal timing and expected treatment life for maximum benefit for each treatment
3. Methodology to predict the life extension of existing pavements.
4. Methodology to estimate cost savings associated with various treatments.

Potential Partners: FHWA, AASHTO, APWA, FP2, Contractors

Estimated Cost and Duration: $350,000 30 months

User Community: State and local agencies, AASHTO, APWA, Contractors, Academia

Implementation: Prepare a marketing plan for the products that are developed as a result of this research project. The marketing plan should refine the target market and provide a systematic approach to making sure that key decision makers become aware of the features advantages and benefits. The plan should also facilitate distribution of the products to early adopters with sufficient support for timely implementation.

Results

- Pavements – 38 statements
- Bridge – 25 statements
- Estimated Cost > $40M

Pavements

Category	# of Problem Statements
Asset Management	8
Design	7
Materials	7
Construction	7
Contracting Methods	3
Performance	6

Bridge

Category	# of Problem Statements
Asset Management	7
Decks and Joints	4
Superstructure	5
Substructure	5
Selection of Preservation Actions	2
Performance	2

Top 5 Pavement Statements by Importance AND Priority

Table B-1 - Top Pavement Preservation Priorities Rated by Combined Importance & Priority

		Pavement Preservation Needs Statements	
Rank	Needs Statement #	Title	Weighted Importance + Priority
1	Construction 02	Performance Related Specifications (PRS) for Pavement Preservation treatments	2.24
	2.13	3 Design 01	Determine the Economic Benefits of Pavement Preservation Strategies
	1.86	4 Contracting Methods 03	Development of Model Specifications and Testing Require for Pavement Preservation Contracting Methods
	1.85	5 Performance 03	Quantify Performance and Benefits of Various Pavement Preservation Treatments and Develop Pavement Preservati Treatment Performance Models

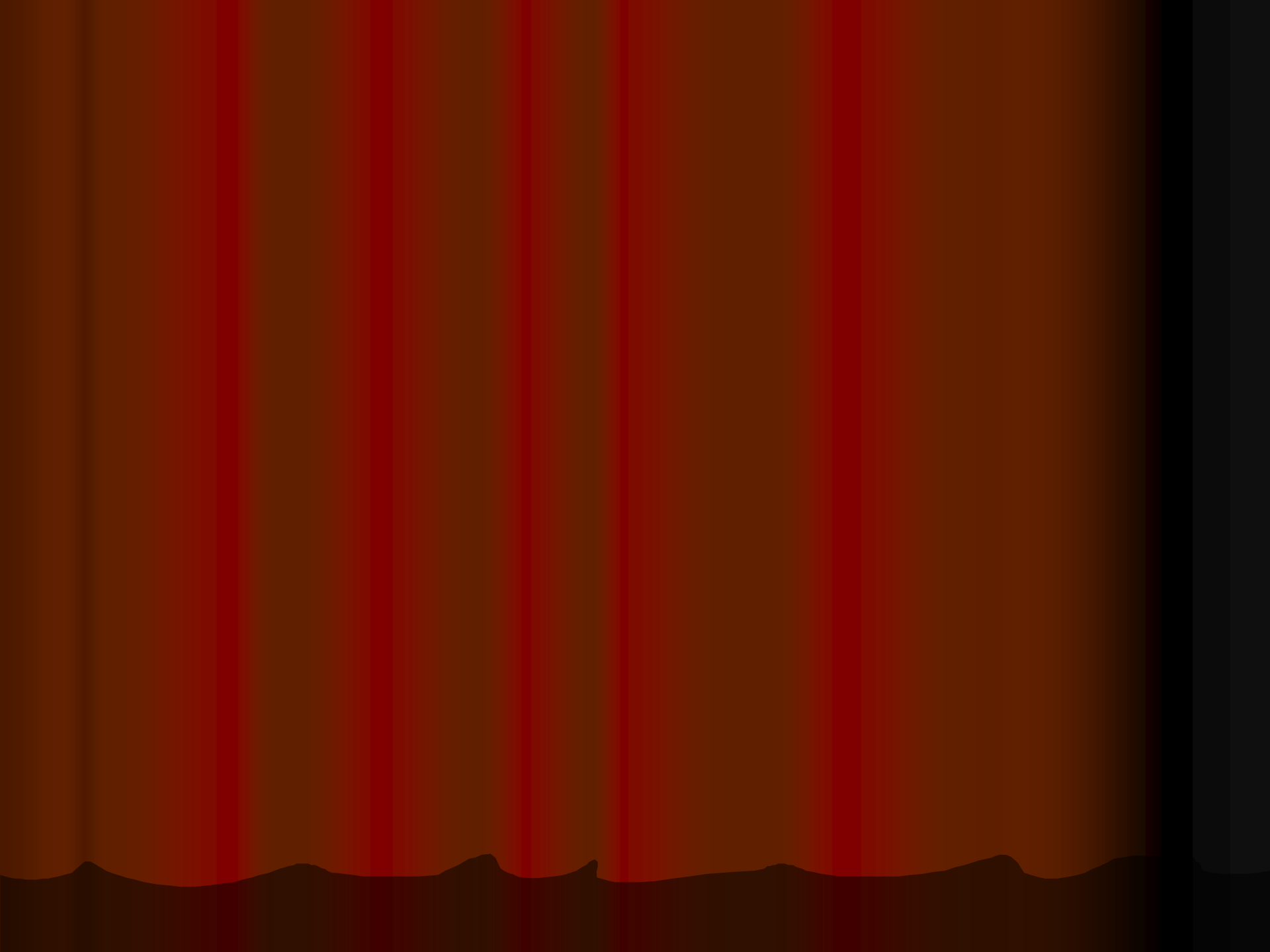
Top 5 Bridge Statements by Importance AND Priority

Table B-2 - Top Bridge Preservation Priorities Rated by Combined Importance & Priority

		Bridge Preservation Needs Statements	Weighted Importance + Priority
Rank	Needs Statement #	Title	
1	Superstructures 04	Improved Inspection Techniques for Steel Prestressing Strand, Cables, and Ropes	2.54
2	Performance 01	Quantify the Information Necessary to Guide Bridge Preservation Decisions	2.11
3	Decks & Joints 01	Best Practices for Preserving Bridge decks	2.06
4	Selection 01	Implementation of Preservation Practices on Highway Bridges by State DOTs	2.04
5	Substructures 01	Preservation of Concrete Highway Bridge Substructure Units by Preventing or Delaying the Initiation of Active Corrosion of the Steel Reinforcement	1.87

Next Steps/ Implementation

- Short-and long-term research needs for pavement preservation and bridge preservation
- Presented for AASHTO Subcommittee on Maintenance
- Develop tracking mechanism on TSP2



Transportation Curriculum Coordination Council (TCCC)

Addressing Challenges in Construction and Maintenance Workforce and Quality

Challenges

Worker Qualification

- FHWA regulations require the qualification of materials testers and construction inspectors
- Quality work and quality performance are the objective
- Technicians and maintenance workers are often overlooked in training programs

transportation technologies.”

- Improve construction and maintenance quality through support of the highest quality highway transportation workforce

- Efficiently deliver the highest quality of roadway performance to the highway customer.

Central Focus

- Agencies had similar needs among their training
  - Many states were using the same tests but not sharing information or training materials
  - Reciprocity between programs was needed
- Duplicative effort in training development
- Qualification programs have expanded to many other construction disciplines

TCCC Mission

- Coordinate training and certification efforts
- Establish a national core curriculum
- Develop training materials
- Support agency training efforts

Partnership Effort

- Regional Certification Groups
- AASHTO Subcommittees
- Local transportation agencies
- FHWA/ NHI
- Industry groups
- Academia

TCCC Activities

- Development of Core Curriculum
- Database of Training Resources
- Training Development

Core Curriculum Development

- Five Program Areas
  - Construction
  - Maintenance
  - Materials
  - Safety
  - Employee Development
- Planning tool for training managers
- Tool for TCCC training development

Preservation Contractor Training and Qualification Program

- Availability of quality contractors key to success
- “Poisoned pool”
- Joint effort – industry and agency
  - Training and qualification of contractor and agency workers/ inspectors
  - Qualification of contractors

Preservation Contractor Training and Qualification Program

- Training curriculum development
  - Crack sealing
  - Chip seal
  - Microsurfacing
  - Slurry seal
- Compare to existing training (agency and industry)

Available NHI Training

- 131107 – Transportation Asset Management
- 131115 – Pavement Preservation: Preventive Maintenance Treatment, Timing, and Selection
- 131103 A, B, C – Pavement Preservation: Design and Construction of Preventive Maintenance Treatments

More NHI Training

- 131104 – Pavement Preservation: Integrating Pavement Preservation Practices into Pavement Management
- 131116, A – Pavement Management: Characteristics of an Effective Program
- 131110 – Pavement Preservation Treatment Construction – WEB-BASED

FHWA/NCPP Pavement Preservation Technical Appraisals and Evaluations

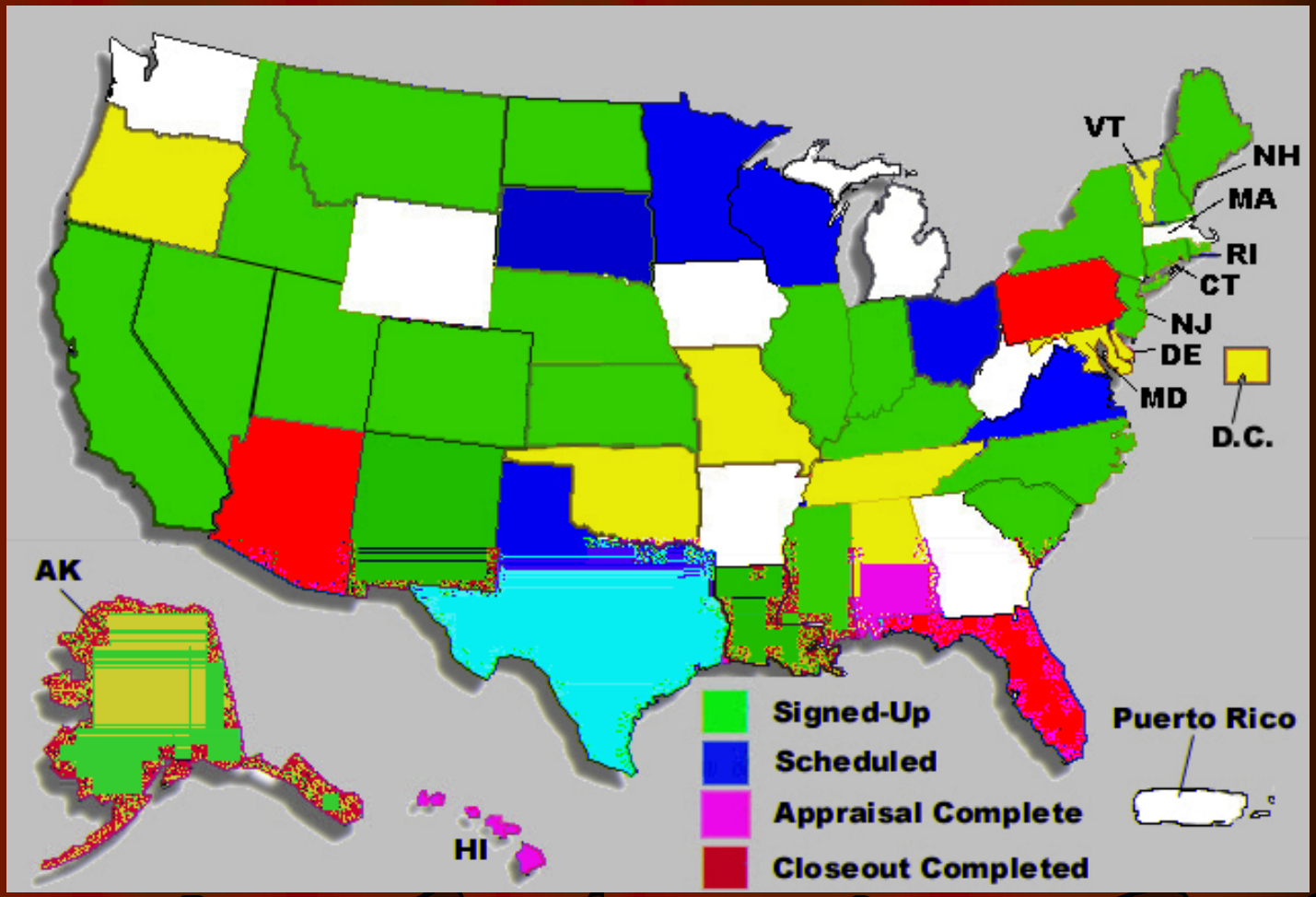
What is it?

- **Develop guidelines for improvement**
- **Agency self-assessment**
- **Provide state appraisal results**
- **Identify national trends**
- **Comparisons of agency results to national or regional trends**

Program Goals

- Accessible & Secure
- Confidential
- Informative
- Facilitate Self-Evaluation
- Identify Best Practices

Appraisal Status Map



Interim Findings

- A recognized need for pavement preservation
- “Worst First” project selection paradigm
- Many agencies in early stage of a preservation program. Many experience internal resistance especially at the legislative level.
- Lack preservation program funding

Interim Findings (2)

- Limited suite of treatments in “toolbox.” Lack of familiarity with treatments and best practices.
- Poor experiences with many treatments
- Need to expand public education / awareness
- Better performance tracking and PMS integration needed

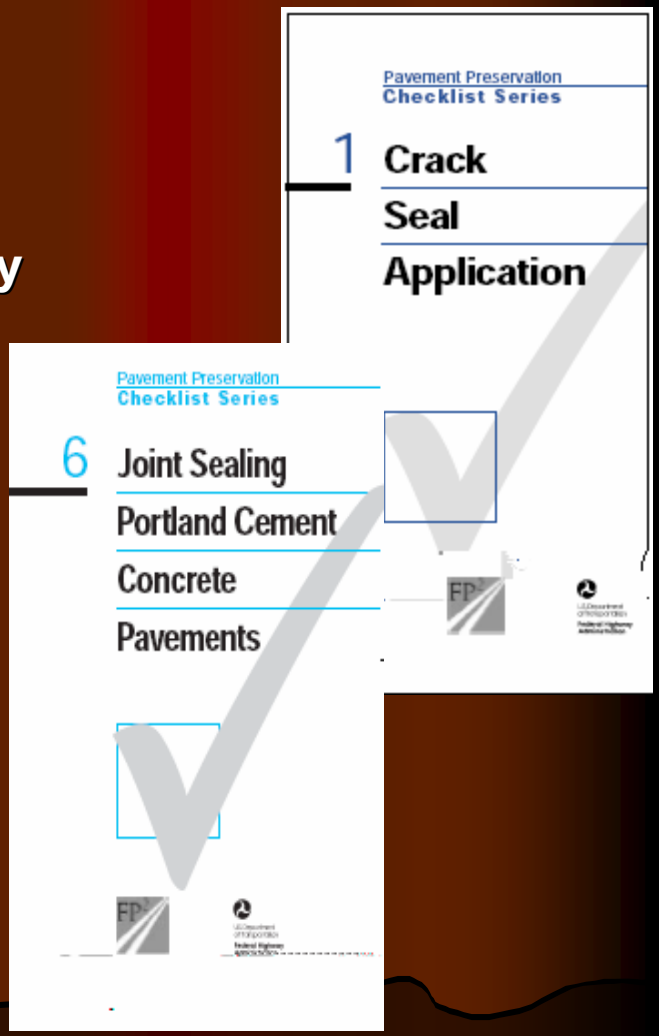
Interim Findings (3)

- Difficulty in finding good contractors and a shortage of quality materials
- Great need for training and certification
- More research is needed to demonstrate benefits

FHWA Publications

Pavement Preservation Checklists

- #1 - Crack Seal
- #2 - Chip Seal
- #3 - Thin Hot-Mix Asphalt Overlay
- #4 - Fog Seal
- #5 - Microsurfacing
- #6 - Joint Sealing
- #7 - Diamond Grinding
- #8 - Dowel Bar Retrofit
- #9 - Partial-Depth Repair
- #10 - Full-Depth Repair
- #11 - Hot-in-Place Recycling
- #12 - Cold-in-Place Recycling
- #13 - Slurry Seal

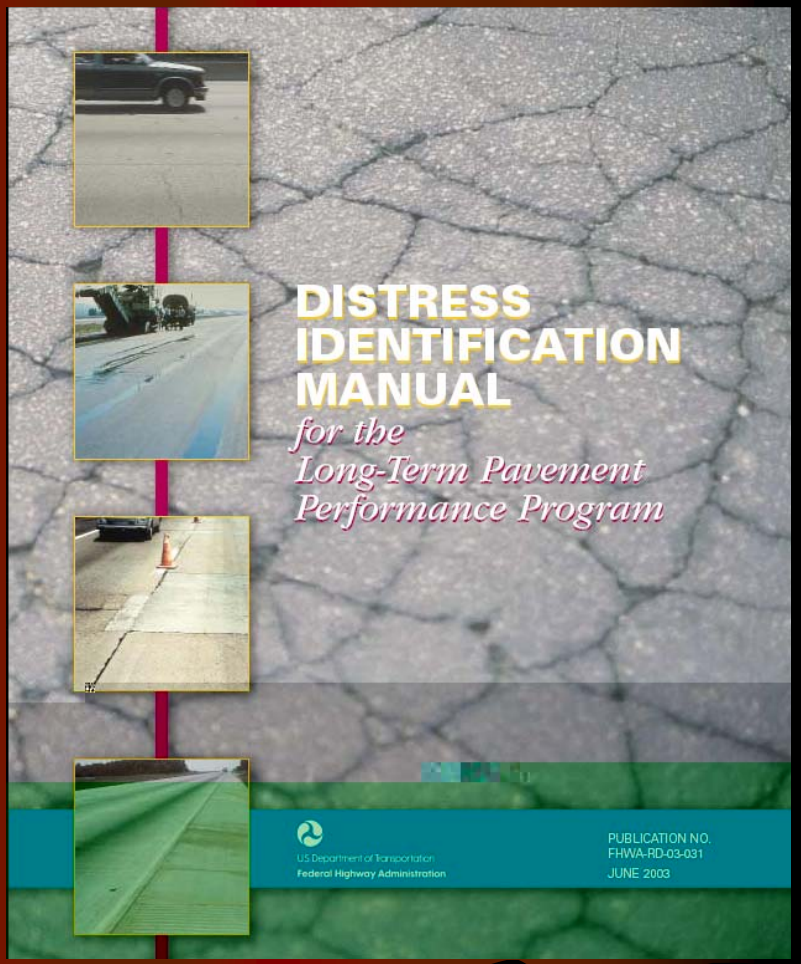


Pavement Preservation Compendiums

- 2 Volumes
- Collection of Pavement Preservation Articles from FHWA, State and local agencies, and industry groups

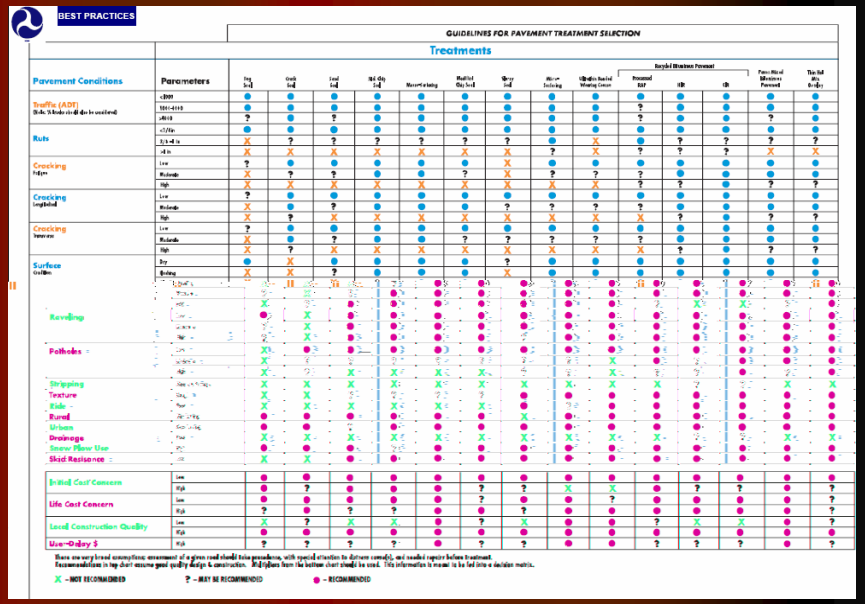
Pavement Distress Guides

- Guide for Identifying and Documenting Pavement Distresses



A Pocket Guide to Asphalt Pavement Preservation

- Joint Effort by FHWA, FP2 and SemMaterials
- Guide to Selection Asphalt Treatments based on Distresses, Traffic, Cost Concerns, etc.


BEST PRACTICES

GUIDELINES FOR PAVEMENT TREATMENT SELECTION

Treatments

Pavement Conditions	Parameters
Traffic (ADT)	<1000
	1001-4000
	>4000
Ruts	<1/4in
	1/4-1 in
	>1 in
Cracking	Low
	Moderate
	High
Cracking	Low
	Moderate
	High
Cracking	Low
	Moderate
	High
Surface	Dry
	Raveling
Raveling	
Potholes	
Stripping	
Texture	
Ride	
Rutted	
Urban	
Drainage	
Snow Plow Use	
Skid Resistance	
Initial Cost Concern	Low
	High
Life Cost Concern	Low
	High
Local Construction Quality	Low
	High
User-Delay $	High

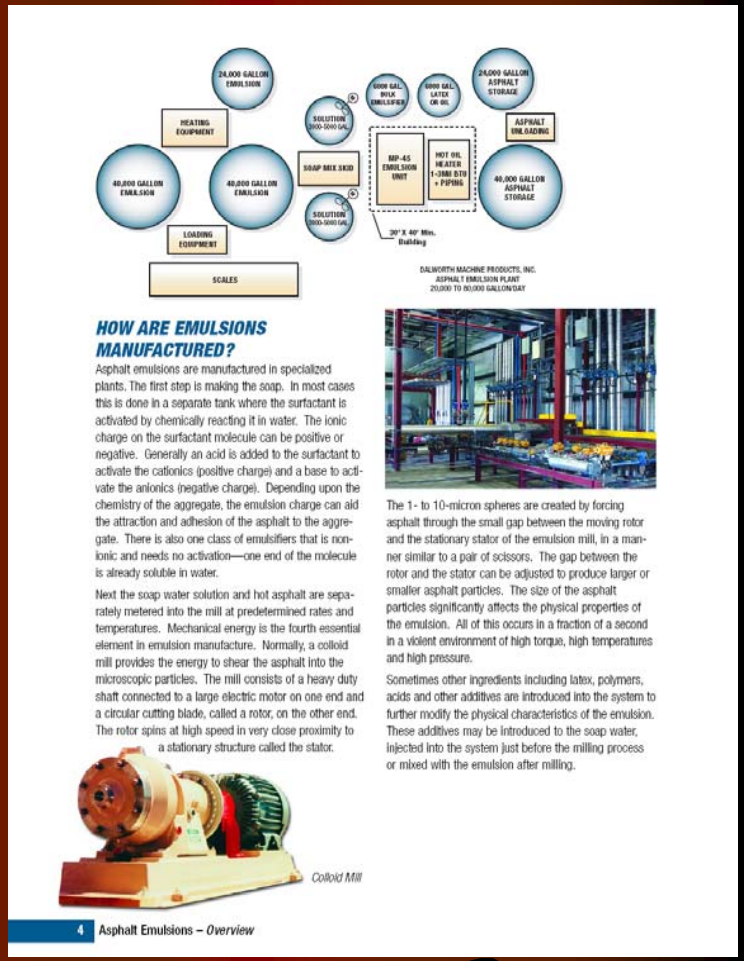
Recycled Bituminous Pavement

Base on very broad assumptions; assessment of a given road should take precedence, with special attention to distress cause(s), and needed repair before treatment.
Recommendations in top chart assume good quality design & construction. If failures from the bottom chart should be used. This information is meant to be fed into a decision matrix.

X – NOT RECOMMENDED ? – MAY BE RECOMMENDED ● – RECOMMENDED

Asphalt Emulsions

- Publication from the Asphalt Emulsions Manufacturers Association (AEMA)
- Basic Overview of Asphalt Emulsions
- Discusses how Emulsions contribute to Asphalt Recycling and Pavement Preservation



Quick Check of Your Highway Network Health

A Quick Check of Your Highway Network Health

by Larry Galehouse, Director
National Center for Pavement Preservation
and
Jim Sorenson, Team Leader,
FHWA Office of Asset Management

Historically, many highway agency managers and administrators have tended to view their highway systems as simply a collection of projects. By viewing the network in this manner, there is a certain comfort derived from the ability to match pavement actions with their physical/functional needs. However, by only focusing on projects, opportunities for strategically managing entire road networks and asset needs are overlooked. Although the "bottom up" approach is analytically possible, managing networks this way can be a daunting prospect. Instead, road agency administrators have tackled the network problem from the "top down" by allocating budgets and resources based on historic estimates of need. Implicit in this approach is a belief that the allocated resources will be wisely used and will prove adequate to achieve desirable network service levels.

By using a quick checkup tool, road agency managers and administrators can assess the needs of their network and other highway assets and determine the adequacy of their resource allocation effort. A quick checkup is readily available and can be usefully applied with minimum calculations.

It is essential to know whether present and planned program actions (reconstruction, rehabilitation, and preservation) will produce a net improvement in the condition of the network. However, before the effects of [illegible] network can be [illegible] should be considered.

Assume that every [illegible] of road in the network was rated by the number of years remaining until the road [illegible] that terminal condition does not mean a failed road; rather, it is the level of deterioration that management has set as a minimum operating condition for that road or network. Consider the rated result of the current network condition, shown in Figure 1.

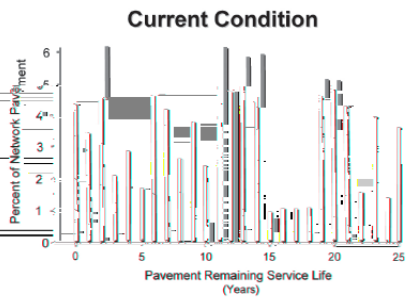


Figure 1. Current condition.

Pavement Preservation Toolbox CD's

- Publications from:
  - FHWA
  - State and Local Agencies
  - Industry Groups

Pavement Preservation Expert Task Group (PPETG)

- FHWA
- State DOT's
- Local Agencies
- Consultants
- Contractors
- Suppliers
- Academia

Emulsions Task Force

- Began April 2008
- Promoting Asphalt Emulsions
- Testing Methods and Specs
- Current Studies in Emulsions

FHWA FALCON Teams

- **F**ocus **A**rea **L**eadership and **CO**ordinatio**N**
- 6 teams
  - Pavement Design and Analysis
  - Materials and Construction Technology
  - Pavement Management and Preservation
  - Surface Characteristics
  - Construction Quality and Materials QA
  - Environmental Stewardship

FHWA TSP Manual

- Written for the FHWA Field Offices
- Provide guidance on:
  - TSP Policy
  - Pavement Preservation
  - Bridge Preservation
  - Roadside Features

Thank You

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