Pavement Preservation and Preservation Activities at the National Level

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26th Regional Local Road Conference
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Rapid City, SD
Without Pavement, We Would Be Stuck in the Mud!

Washington-Richmond road, 1919
NMAH, Archives Center, API Collection
Topics to be discussed:

1) Pavement Preservation and Asset Management Concepts
2) FHWA and Our Activities in Pavement Preservation
3) Useful Resources
4) 2010 LTAP Center Director Survey Results
Less Than 100 Years Ago…
We’ve Come a Long Way …
4 Million Miles of Roads
600,000 Bridges
Statistics We Should Know:

Federal = 3%
State = 20%
Local = 77%

2/3 are Paved (1/3 Unpaved)
94% of Paved have an Asphalt Surface
Society Depends on Infrastructure

Social Interactions

Economic Transactions

Infrastructure

2007 Average US Household Expenditures 18% for Transportation

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The Stakes are LARGE!

- $2 Trillion Investment in Transportation Infrastructure.
- There are MANY owners.
- There is shared expertise.
- Our Country DEPENDS on Our Success!!!
Transportation Asset Management

RESOURCES

Preservation  Operations  Capital Improvement  Safety  Other

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Motivation for Asset Management

- Funding Constraints
- Aging System
- Increasing User Demands
- Loss of Senior Experienced Staff
- Public Demands on Government
  - Accountability
  - Return-on-Investment
Asset Management

• Extends the life of existing facilities
• Retains the value of an asset and its ability to perform as designed
• Effective Pavement Management and Preservation provides:
  – Long term cost savings
  – Less disruption to the traveling public
  – Improves the overall network condition
  – Reductions in environmental impacts
The Federal Role:

- Promote uniformity, quality, and safety aspects of highway construction and maintenance.
- Develop, promote, and provide new technologies and training.
- Stewardship of the Federal-aid program and its investments.
FHWA Vision → Mission

• “Our Agency and our transportation system are the best in the world.”

• “Improve Mobility on our Nation’s Highways through National Leadership, Innovation, and Program Delivery.”
FHWA Pavement & Materials Program

Process to Deliver National Pavement Network That Is:

- Safe
- Cost Effective
- Long Lasting
- Effectively Maintained

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RC Technical Services Teams

- Air Quality
- Civil Rights
- Construction & Project Mgt.
- Environment
- Finance Services
- Geotech & Hydraulics
- Knowledge Applications
- Structures
- Safety & Design
- Planning
- Pavement & Materials
- Operations

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Office of Asset Management, Pavement and Construction

4 Teams
- Design and Analysis
- Materials
- Construction
- Asset and Pavement Management

New –
Office of Program Performance Management
also with 4 New Teams

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Points of Contact
Butch Wlaschin, Director

• Suneel Vanikar
  Design and Analysis Team Leader

• John Bukowski
  Materials Team Leader

• Bryan Cawley
  Construction and Construction Management Team Leader

• Steve Gaj
  Asset Management and Pavement Management Team Leader
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New Construction → Preservation

The graph shows the trend of VMT (Vehicle Miles Traveled) and Lane Miles from 1980 to 2020. The VMT trend line indicates a steady increase over the years, while the Lane Miles trend line remains relatively flat. The graph is part of the 26th Regional Local Road Conference in Rapid City, SD.
Pavement Preservation

Doing the *right* thing...

...to the *right* pavement.

...at the *right* time...

TO KEEP THE “GOOD” ROADS GOOD!
The Pavement Preservation Concept

Rehabilitation Trigger

Original Pavement

Time (Years)
Which Costs Less???
Energy Use Comparisons

![Energy Use Comparisons](image-url)

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FHWA’s “3 E’s”

- **ENGINEERING**
  - Use Good Engineering Design to Assure Long-Life Pavements and Assets.

- **ECONOMICS**
  - Use Life-Cycle Cost Analysis for Project Selection.

- **ENVIRONMENT**
  - Consider Recycling First
  - Be Good Stewards of the Environment
Key FHWA Policy Memos

- Preventive Maintenance Eligibility
  - 10/8/04
- Pavement Preservation Definitions
  - 9/12/05

http://www.fhwa.dot.gov/preservation
Categories of Pavement Preservation

- Pavement Preservation
  - Minor Rehabilitation
  - Preventive Maintenance
  - Routine Maintenance
## Pavement Preservation Guidelines

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>Increase Capacity</th>
<th>Increase Strength</th>
<th>Reduce Aging</th>
<th>Restore Serviceability</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Construction</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Reconstruction</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Major (Heavy) Rehabilitation</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Structural Overlay</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Minor (Light) Rehabilitation</td>
<td></td>
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<tr>
<td>Preventive Maintenance</td>
<td></td>
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<tr>
<td>Routine Maintenance</td>
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<tr>
<td>Corrective (Reactive) Maintenance</td>
<td></td>
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<tr>
<td>Catastrophic Maintenance</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

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Stresses and Strains -- but
Preservation is Non-Structural!

Figure 2. Layered Elastic Model Representation of a Pavement.

Tire has a total load $P$, spread over a circular area with a radius of $a$, resulting in a contact pressure of $p$.

- No horizontal boundary, assume layers extend infinitely.
- No bottom boundary, assume soil goes on infinitely.

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www.asphaltalliance.com

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### Preservation Activities - Examples

<table>
<thead>
<tr>
<th>Asphalt:</th>
<th>PCC:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip Seals</td>
<td>Joint Resealing</td>
</tr>
<tr>
<td>Fog Seals</td>
<td>Crack Sealing</td>
</tr>
<tr>
<td>Slurry Seals</td>
<td>Spall Repair</td>
</tr>
<tr>
<td>Surface Seals</td>
<td>Dowel Bar Retrofit</td>
</tr>
<tr>
<td>Micro-Surfacing</td>
<td>Full and Partial Depth Repair</td>
</tr>
<tr>
<td>Thin Overlays</td>
<td>Diamond Grinding</td>
</tr>
<tr>
<td>Profile Milling</td>
<td></td>
</tr>
<tr>
<td>Crack Sealing</td>
<td></td>
</tr>
</tbody>
</table>
Preventive Maintenance Treatments LAST LONGER When applied at the Right Time!

Pavement Condition

Time

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Benefits of Preservation

- Improved Customer Satisfaction
  - Keeps them (and you) happy.

- Lowers User and Agency Costs in the Long-Term
  - Saves them (and you) money.

- Improved Safety
  - Keeps them (and you) safer.

- ENVIRONMENTALLY RESPONSIBLE!
Does Preservation Make Sense?
FHWA Pavement Preservation Support

- **Working with the States**
  - AASHTO and the TSP
  - Individual States and FHWA Division Offices

- **Working with Industry**
  - Industry Associations: FP2
  - AEMA, ARRA, ISSA, FP2, NAPA, ACPA, IGGA, etc.

- **Outreach Activities**
  - FHWA websites, publications, products, meetings

- **Training – National Highway Institute**

- **Technology Advancement**
  - Research
  - National Center for Pavement Preservation
  - TRB, NCHRP
  - Recycled Materials Resource Center
FHWA Web-Based Resources

- www.fhwa.dot.gov/pavement
- www.fhwa.dot.gov/preservation
14 CHECKLISTS
CD’s/DVD’s

COMPENDIUMS

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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
NHI Preservation Training

- 131103 A, B, C – Pavement Preservation: Design and Construction of Preventive Maintenance Treatments
- 131106 – Transportation Asset Management
- 131114 - Pavement Preservation: Optimal Timing of Pavement Preservation Treatments
- 131115 – Pavement Preservation: Preventive Maintenance Treatment, Timing, and Selection
- 131116A – Pavement Management: Characteristics of an Effective Program
NHI Preservation Training - FREE

- 131110 – Pavement Preservation Treatment Construction – WEB-BASED
  - HMA Treatments
  - PCC Treatments
  - HMA Overlay Inspection

TCCC: www.nhi.fhwa.dot.gov/tccc
Training Under Development

- Maintenance Academy
- PHT – Pavement Health Tool
- Advanced Emulsion Technology
- Environmental Factors for Construction and Maintenance
Transportation System Preservation Research Roadmap


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Partnerships Are Required

- FHWA
- Academia
- State DOTs
- Local Governments
- Private Sector

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Partnerships are Required

- 1 FHWA
- 52 State DOTs (including DC and PR)
- 3,034 County governments;
- 35,933 Municipal, Town and Township governments.
- 4,140 Colleges and Universities
- ____ contractors/industry reps.

UNITED WE STAND....
Preservation Partnerships – TSP²

Alaska

NORTHEAST

ROCKY MOUNTAIN WEST

MIDWESTERN

SOUTHEAST

Hawaii

D.C.

Puerto Rico

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Pavement Preservation Partnerships

- If your State, Municipality, or County is not a member yet...
- Please get a flyer ....
- And Join Us in preserving our existing assets in good condition!

www.pavementpreservation.org or www.tsp2.org
LTAP/TTAP Director Survey Respondents
47 Total Respondents - (3 duplicates / 1 TTAP) – Survey Monkey

Participating States:
- Alaska (TTAC)
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- Florida
- Georgia (2)
- Hawaii
- Idaho
- Illinois
- Indiana
- Iowa
- Kentucky
- Louisiana
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Missouri (2)
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina (2)
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Texas
- Utah
- Vermont
- Washington
- Washington, D.C.
- West Virginia
- Wisconsin
- Wyoming
- Puerto Rico

Not Participating States:
- Alabama
- Arizona
- Arizona (TTAC)
- Arkansas
- Arkansas (2)
- Arkansas (TTAC)
- California (TTAC)
- Colorado
- Colorado (TTAC)
- Connecticut
- Connecticut (TTAC)
- Delaware
- Florida
- Georgia
- Hawaii
- Hawaii (TTAC)
- Illinois
- Illinois (TTAC)
- Indiana
- Indiana (TTAC)
- Iowa
- Iowa (TTAC)
- Kansas
- Kentucky
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- Louisiana
- Louisiana (TTAC)
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- Nevada
- Nevada (TTAC)
- New Hampshire
- New Hampshire (TTAC)
- New Jersey
- New Jersey (TTAC)
- New Mexico
- New Mexico (TTAC)
- New York
- New York (TTAC)
- North Carolina
- North Carolina (2)
- North Carolina (TTAC)
- North Dakota
- North Dakota (TTAC)
- Ohio
- Ohio (TTAC)
- Oklahoma
- Oklahoma (TTAC)
- Oregon
- Oregon (TTAC)
- Pennsylvania
- Pennsylvania (TTAC)
- Rhode Island
- Rhode Island (TTAC)
- South Carolina
- South Carolina (TTAC)
- South Dakota
- South Dakota (TTAC)
- Tennessee
- Tennessee (TTAC)
- Texas
- Texas (TTAC)
- Utah
- Utah (TTAC)
- Vermont
- Vermont (TTAC)
- Washington
- Washington (TTAC)
- Washington, D.C.
- Washington, D.C. (TTAC)
- West Virginia
- West Virginia (TTAC)
- Wisconsin
- Wisconsin (TTAC)
- Wyoming
- Wyoming (TTAC)
Section 1

- Has your LTAP center offered any classes on these topics in the last 3 years?

- What is the preferred length of training sessions for your customers?

- What are the barriers to presenting pavement preservation training?
Has your LTAP Center offered any of these classes in the last 3 years?
What is the preferred length of training sessions?

- One day: 90%
- Two days: 10%
- Other (half day, etc): 0%
What are the barriers to pavement preservation training?

- Identification of Qualified Instructors: 50%
- Can't Add More to Existing Courses: 30%
- Agencies Not Requesting Training: 40%
- Other (funding, travel restrictions, etc): 0%
Section 2

- Which items do the LTAPs believe are valuable to their local agency customers?
- To which websites do the LTAPs link from their websites?
- Are there any unmet needs for PP materials or training in your state?
Which of these items are valuable to your customers?

- Checklists: 84%
- CD's: 84%
- Compendium: 16%
- Factsheets: 70%
- Reprints: 30%
To which websites do the LTAPs link from their websites?

- FHWA: 60%
- FP2: 33%
- NCPP: 33%
- Others: 0%
Are there any unmet needs?

- Yes: 45%
- No: 18%
- Not sure: 37%
Section 3

- Is the pavement preservation message adequately communicated to your local government customers?

- Do you have any other comments on pavement preservation that you would like to share with the Expert Task Group?

- Please provide your contact information.
1. Is the pavement preservation message adequately communicated to your local government customers?

Responses

- YES: 39%
- NO: 15%
- NOT SURE: 46%
2. Do you have any other comments on pavement preservation that you would like to share with the Expert Task Group?

12 Comments

1. Request for Spanish Language publications/training
2. There is still institutional inertia to be overcome
3. PP not a big issue in our State
4. PP is a growing issue in our State
5. PP Training is embedded in our other training
6. Need help with unpaved surfaces
LTAP Survey Observations (1/3)

- Most common training in area of Chipseal and Hot Mix Asphalt
- Least Common in the area of White Topping and Asset Management
- Training courses need to kept to one day or less
- Self Directed Webinars are the most beneficial to local agencies
LTAP Survey Observations (2/3)

- LTAP barrier to providing training is identifying qualified instructors (32%)
- Local Agencies have not requested PP training from LTAPs (34%)
- PP Check List Series is most valuable publication/Material for Local Agencies
- Many LTAP centers are not providing key PP web links on their sites
80% of LTAPs indicated there are unmet or unknown needs in PP training

More than 50% of LTAPs indicated that the PP message was not adequately communicated to Local Agencies
LTAP Training Recommendations

- Promote the need for PP
- Pavement Management System key to successful PP program
- Training Courses one day or less
- Utilize Web Based Training (WBT)
- Identify qualified instructors
FHWA Supports Pavement Preservation!

Left to right: Associate Administrator for Infrastructure King Gee; Administrator Tom Madison; James B. Sorenson, Highway Engineer; and Executive Director Jeff Paniati.
THANK YOU!

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Pavement and Materials Engineer
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MOVING THE AMERICAN ECONOMY