“Partnerships for Progress in Transportation”
Session 15: Monday February 18, 2012

Oil of OverLAY: Age Defying Secrets

Mark Chenevert / Simone Ardoin
PAVEMENT PRESERVATION

Stephen R. Mueller, P.E., MPA
Pavement and Materials Engineer
FHWA Resource Center (Lakewood, Colorado)
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Cost of Delaying Maintenance

Teeth Cleaning: $75

Root Canal: $1,000
Cost of Delaying Maintenance

Timing Belt Replacement: $400

Engine Replacement: $3,500
1. Background / Statistics
2. Institutionalizing Pavement Preservation – 20 years of history
3. Training
4. Research
5. Marketing / Communications
The RC is Serving customers nationwide
RC Technical Services Teams

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

Louisiana Transportation Conference February 18, 2013
Without Pavement, We Would Be Stuck in the Mud!

Washington-Richmond road, 1919
NMAH, Archives Center, API Collection
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
FHWA Asset Management, Pavement and Construction

Points of Contact

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- 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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FHWA Federal Lands

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Less Than 100 Years Ago...
We’ve Come a Long Way …
Statistics We All Need to Know:


2. What Percentage of the Roads are Owned by:
   A. Federal Government? ______%
   B. State Government? ______%
   C. Local Government? ______%

3. How Much of the Network is Paved? ______ %
   Unpaved? ______%
National Statistics:
4,059,340 miles of Roads   603,310 Bridges
2.99 trillion vehicle-miles / year
## Public Highway Ownership

<table>
<thead>
<tr>
<th>Jurisdictions</th>
<th>Miles</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>131,559</td>
<td>3</td>
</tr>
<tr>
<td>States</td>
<td>784,310</td>
<td>19</td>
</tr>
<tr>
<td>Locals</td>
<td>3,143,471</td>
<td>78</td>
</tr>
<tr>
<td><strong>TOTAL:</strong></td>
<td><strong>4,059,340</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

*2010 Conditions and Performance Report, FHWA*

National Statistics:
2.5 Million Miles of Paved Roads

Paved vs. Unpaved Roadways-U.S. Total
2,523,468 miles vs. 1,438,727 miles

- Paved - Urban Local: 15%
- Paved - Rural Minor Collector: 21%
- Paved - Rural Local: 5%
- Paved - High Type Rigid: 1%
- Paved - High Type Composite: 2%
- Paved - High Type Flexible: 13%
- Paved - Low Type: 2%
- Paved - Intermediate Type: 4%

Unpaved: 37%
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
OUR SOCIETY DEPENDS ON OUR INFRASTRUCTURE FOR THE MOVEMENT OF BOTH PEOPLE AND GOODS!

SOCIAL INTERACTIONS

ECONOMIC TRANSACTIONS

INFRASTRUCTURE

What is Pavement Preservation?

Applying the *right* treatment...

...to the *right* road.

...at the *right* time...
What is Pavement Preservation?

**Includes:**
- Preventive Maintenance
- Minor Rehabilitation (non-structural)
- Some Routine Maintenance

**Does Not Include:**
- New Pavement Construction
- Reconstruction
- Major Rehabilitation (increase in structural capacity)
- Corrective Maintenance
Pavement preservation is a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations.
Performance Curves / Costs of Repairs

Pavement Condition

$1.00 to Preserve / Maintain Here

40% Drop in Quality

75% of Life

Terminal Serviceability

40% Drop in Quality

12%

$4-$5 ?

$11-$14 ?

$32-$58 ?

Here!

Pavement Life

T₀

Initial Design

T₁
“Selecting a Preventive Maintenance Treatment for Flexible Pavements”
Dr. R. Gary Hicks, P.E., Stephen B. Seeds, P.E., David G. Peshkin, P.E., March 2000
The Pavement Preservation Concept

- **Original Pavement**
- **Rehabilitation Trigger**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Time (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Very Poor</td>
<td></td>
</tr>
</tbody>
</table>
1. Background
2. Institutionalizing Pavement Preservation – 20 years of History
3. Training
4. Research
5. Marketing / Communications
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.
Pavement Preservation Expert Task Group (PPETG)

Brainchild of Jim Sorenson

Formed in 1992

Composed of Representatives from State DOTs, Industry, and Academia

Purpose: Advise and Support FHWA efforts.
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.
Partnerships Are Required

- FHWA
- Academia
- State DOTs
- Local Governments
- Private Sector
Foundation for Pavement Preservation

Formed in 1992
AEMA, ARRA, ISSA founding members
Worked with FHWA and PPETG to produce many products
Jerry Eller, former FHWA Chief Engineer eventually became the Executive Director
AASHTO Subcommittee on Maintenance
Pavement Task Force
STATEMENT OF DIRECTION
“The purpose of the Pavement Task Force is to promote the preservation of pavements.”
AASHTO Support for Pavement Preservation
Subcommittee on Maintenance, Charleston, SC
A formal agreement between – Foundation for Pavement Preservation & Michigan State University
Memorandum on Preventive Maintenance Eligibility

From: King W. Gee, Associate Administrator for Infrastructure

Dated: October 8, 2004

http://www.fhwa.dot.gov/preservation/100804.cfm
Eligible Activity Examples

**Roadway Activities:**
- Crack Sealing and Joint Repairs
- Seal Coats (fog seals, slurry seals, chip seals)
- Pavement Patching and Thin Overlays
- Shoulder Repair
- Restoration of Drainage Systems

**Bridge Activities:**
- Seismic Retrofit
- Scour Countermeasures
- Painting.
Definitions Memorandum

From: David R. Geiger, P.E.
Director, Office of Asset Management

Dated: September 12, 2005

http://www.fhwa.dot.gov/pavement/preservation/091205.cfm
Categories of Pavement Preservation

- Pavement Preservation
  - Minor Rehabilitation
  - Preventive Maintenance
  - Routine Maintenance
<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>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Reconstruction</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Major (Heavy) Rehabilitation</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Structural Overlay</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Minor (Light) Rehabilitation</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Preventive Maintenance</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Routine Maintenance</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Corrective (Reactive) Maintenance</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Catastrophic Maintenance</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Stresses and Strains -- but Preservation is Non-Structural!

Figure 2. Layered Elastic Model Representation of a Pavement.

www.asphaltalliance.com
Transportation System Preservation
Technical Services Program

Resolution PR-10-05
Approved by the Board of Directors
May 8, 2005
Transportation System Preservation Technical Services Program (TSP²)

Phase 1: Pavement Preservation

Phase 2: Bridge Preservation

Phase 3: Regional Partnerships
The TSP\(^2\) Website:  www.tsp2.org

- Bulletin Board System
- LISTSERV Email Lists
- Technical and Document Resource Library for Pavement and Bridge Preservation
- Help Desk Requests
- Education / Training Materials
www.pavementpreservation.org

Midwestern
Northeast
Southeastern
Rocky Mountain West

www.tsp2.org
Pavement Preservation Partnerships

If your Municipality, County, or MPO is not a member yet…

And Join Us in preserving our existing assets in good condition!
In 2007, the Foundation for Pavement Preservation was dissolved, and FP2, Inc. was created.

Changed from a 501 c(3) To a 501 c(6) organization to enable a higher level of political involvement under the IRS codes.
Pavement Preservation Journal

Published by FP2, Inc.

1st Published in 2007

Supported through advertising

www.fp2.org
MAP-21 – the New Law

Moving Ahead for Progress in the 21st Century Act (MAP-21) surface transportation legislation enacted July 6, 2012 contains language both specifically, and more generally, helpful to pavement preservation. (quote from www.fp2.org)

http://www.fhwa.dot.gov/map21
Focus the Federal-aid program on the following national goals:

1) SAFETY
2) INFRASTRUCTURE CONDITION
3) CONGESTION REDUCTION
4) SYSTEM RELIABILITY
5) FREIGHT MOVEMENT / ECONOMIC VITALITY
6) ENVIRONMENTAL SUSTAINABILITY
7) REDUCED PROJECT DELIVERY DELAYS
Summary of Key Points

1992 – PPETG and the Foundation for Pavement Preservation were formed.
FHWA, AASHTO, Industry, and Academia have worked hard to advance Pavement Preservation in many different ways.
MAP-21 has codified Pavement Preservation into Federal Law.
Local Involvement can be stronger!
1. Background
2. Institutionalizing Pavement Preservation – 20 years of History
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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
Crack Seal Application
Chip Seal Application
Thin Hot-Mix Asphalt Overlay
Fog Seal Application
Slurry Seal Application
Microsurfacing Application
Hot In-Place Recycling
Cold In-Place Recycling
Fabric Interlayer Application
Joint Sealing
Diamond Grinding
Dowel Bar Retrofit
Partial-Depth Repair
Full-Depth Repair
Download the FREE Checklist Apps

Using your smart phone, go to the Android Marketplace or Blackberry App World to download the FREE app.

Just do a search on “FHWA” and the application will pop up!
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
1. Background
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Transportation System Preservation Research Roadmap

Research Efforts through the Transportation Research Board
NCHRP: National Cooperative Highway Research Program

Founded in 1962.
NCHRP: National Cooperative Highway Research Program

$34 Million per Year
under SAFETEA-LU

www.trb.org
"CHIP SEAL BEST PRACTICES"
NCHRP Synthesis 342 (2005)

"MICROSURFACING"
NCHRP Synthesis 411 (2010)
SYNTHESIS STUDY

Overview of Successful Practices in the United States, Canada, and Overseas.

Literature Search and Surveys.

43 BEST PRACTICES IDENTIFIED

120 Pages
NCHRP Project 20-07/Task 339

Synthesis Study on Best Practices for Crack Sealing and Crack Filling of HMA Pavements
NCHRP Report 742

Communicating the Value of Preservation: A Playbook

December 2012
SHRP-2

Strategic Highway Research Program 2
Product Research, Development, and Implementation.

Renewal:
R-26: Pavement Preservation for High Volume Roadways
R-23: Reuse of Existing Pavement In-Place and Achieving Long-Life
1. Background
2. Institutionalizing Pavement Preservation – 20 years of History
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5. Marketing / Communications
FHWA WEBSITE
www.fhwa.dot.gov/preservation

www.fhwa.dot.gov/pavement
Articles
Pavement Preservation Journal, TRNews
Focus Magazine

Pavement Preservation: A Call to Action

Featuring the third annual Pavement Preservation Conference and the Pavement Preservation Task Force, this issue focuses on how to improve pavement condition and reduce maintenance costs. The conference featured presentations on various pavement preservation techniques, including microsurfacing, sealcoating, and hot-mix asphalt patching.

Louisiana Transportation Conference
February 18, 2013
Advances in Technology Mean New Opportunities….

Webinars – FHWA, TRB, APWA, NACE, LTAP Centers, and many more.

On-Line Libraries:

  NCPP – www.pavementpreservation.org

Electronic Journals: The Pavement Preservation Journal

PowerPoint Presentation Postings – PPP presentations….
Nothing Beats a Conference

2013 LOUISIANA TRANSPORTATION CONFERENCE

February 17-20 | River Center | Baton Rouge

Thank You for the Invite!
Preservation and Asset Management won’t bring short-term glory, but they will bring long-term satisfaction!
Pavement Preservation Mantra:

Apply the *right* treatment...

...to the *right* road...

...at the *right* time.

Use Engineering!
…) Right Road… Right Time. USE PMS
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....
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!

Steve Mueller
FHWA Resource Center
Pavement and Materials Engineer
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Steve.Mueller@dot.gov