



Pavement Preservation on Highly Trafficked Roads: the New Normal

David Peshkin
Applied Pavement Technology, Inc.

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National Pavement Preservation Conference 2016

Presentation Overview

- Background
- Implementation
- Outreach (Phases 1 and 7)
- New Normal
- Next Steps

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Preservation for High Volume Roadways–R26

Challenge

Limited documentation exists about the durability and performance of many pavement preservation techniques on high-traffic volume roads. As a result, techniques have primarily only been applied to low-volume roads.

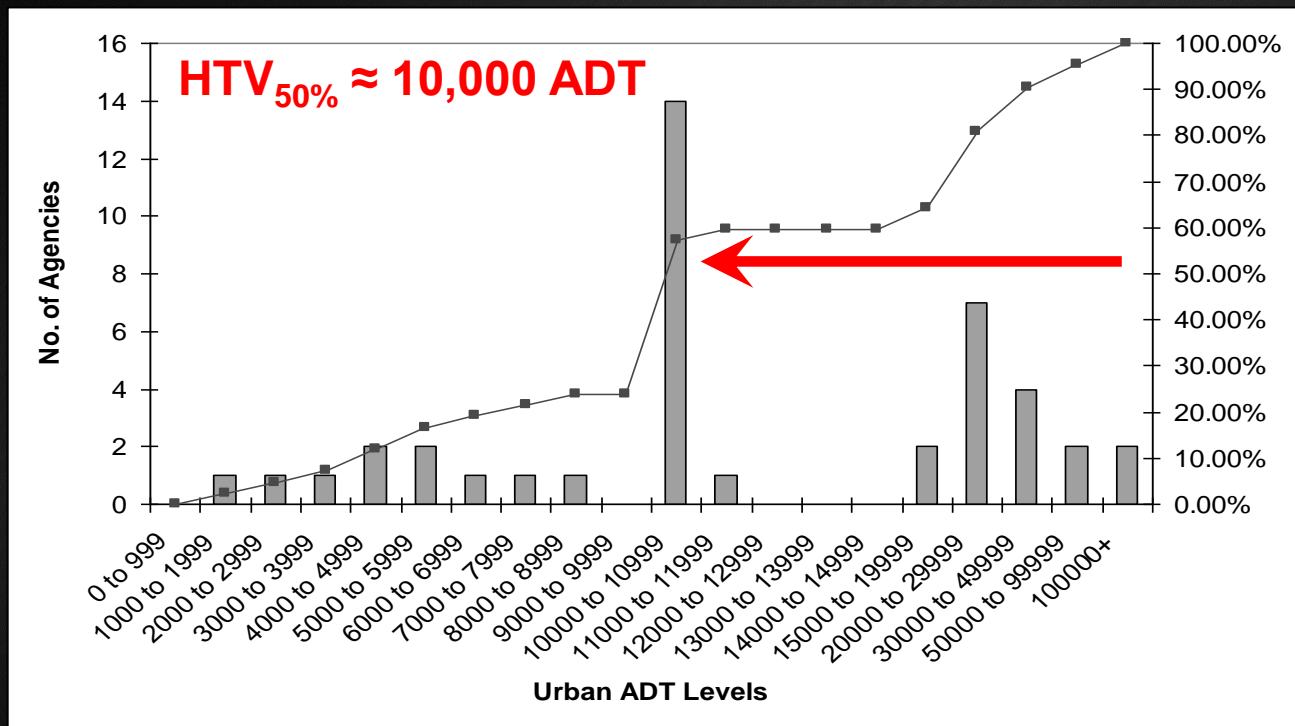
Solution

Test and document the performance of standard preservation techniques on heavily-traveled roads, and create a guide for matching techniques with road conditions.

Agency Priorities and Experience

- High priority considerations in treatment selection:
 - Safety (76% of respondents)
 - Treatment cost (74%)
 - Treatment durability/expected life (64%)
 - Traffic volume: medium-to-high priority
- Top deficiencies addressed by preservation:
 - HMA: random cracking, raveling, friction loss
 - PCC: smoothness, surface distress

Defining High Traffic Volumes – Example for Urban Roads



HMA Treatment Use Based on Definition of High Traffic

- Widely used ($\geq 50\%$) HMA treatments
 - Crack seal and crack fill
 - Thin HMA overlay (rural only)
 - Mill and thin HMA overlay
 - Drainage preservation
- Infrequently used ($< 25\%$) HMA treatments
 - Fog seal, slurry seal, cape seal, scrub seal, chip seals, CIR, HIR, ultra-thin whitetopping

PCC Treatment Use Based on Definition of High Traffic

- Widely used PCC treatments
 - Joint reseal and crack seal
 - Diamond grinding
 - Partial- and full-depth patching
 - Dowel bar retrofit
 - Drainage preservation
- Infrequently used PCC treatments
 - Diamond grooving, thin bonded wearing course, thin HMA or PCC overlay

Preservation Guidelines for HTV Roadways

- State of the practice
 - Types of treatments that can be successfully used on HTV roads
 - Factors that can influence selection of treatments
 - Performance attributes
 - Constructability issues
- Treatment selection process/framework.
 - Feasibility matrixes



Preservation for High Volume Roadways–R26

SHRP2's solution (R26) provides:

- Step-by-step process to identify the best repair techniques based on specific pavement needs and conditions
- Method for weighing various technical inputs and selecting the most appropriate treatments
- Decision matrices
- Summaries of treatment options and examples



R26 - Decision Process

Evaluate Current and Historical Pavement Performance Data

(from field surveys and testing and/or agency PMS database)

- Overall Condition Indicator (PCI, PSR, etc.)
- Individual Distress Types, Severities, and Extents
- Smoothness (IRI, PI, etc.)
- Surface and Subsurface Drainage Characteristics
- Safety Characteristics

Review Historical Design, Construction, and Maintenance and Rehabilitation (M&R) Data

- Pavement Type and Cross-Sectional Design
- Materials and As-Built Construction
- M&R Treatments (materials, thicknesses, etc.)

----- Decision

Develop Preliminary Set of Feasible Preservation Treatments

R26 - Decision Process, pt. 2

↓ Develop Preliminary Set of Feasible Preservation Treatments ↓

Assess Specific Needs and Constraints of Project

Performance Needs

- Treatment Life
 - Traffic effects (functional class and/or traffic level)
 - Climate/environment effects
- Risk
 - Availability of qualified contractors
 - Availability of quality materials

Construction Constraints

- Funding
- Time (of year) of construction
- Geometrics
- Work duration (facility downtime)
- Traffic accommodation

↓ Develop Final Set of Feasible Preservation Treatments ↓

Select the Preferred Preservation Treatment

- Conduct Cost-Effectiveness Analysis
 - Benefit-Cost Analysis
 - Life-Cycle Cost Analysis (LCCA)
- Evaluate Economic and Non-Economic Factors

R26

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R26 Implementation: Round 1

- Agencies submitted applications
- 14 selected and funded

- | | |
|---------------------------------------|---|
| <input type="checkbox"/> Arizona | <input type="checkbox"/> Georgia |
| <input type="checkbox"/> Pennsylvania | <input type="checkbox"/> Rhode Island |
| <input type="checkbox"/> Tennessee | <input type="checkbox"/> District of Columbia |
| <input type="checkbox"/> Kentucky | <input type="checkbox"/> Missouri |
| <input type="checkbox"/> Maine | <input type="checkbox"/> Minnesota |
| <input type="checkbox"/> Wisconsin | <input type="checkbox"/> Washington |
| <input type="checkbox"/> Delaware | <input type="checkbox"/> Massachusetts |

Kentucky Example

US 127 – Test sections for 8 treatments

- Control
- Crack seal
- Ultrathin bonded wearing course
- Microsurface
- Double microsurface
- Thin overlay
- Cape seal
- Joint bond
- Rejuvenator

Massachusetts

US 3

- 10 test sections
- Ultrathin bonded wearing course with modified binders, recycled rubber
- Rejuvenator fog seals
- Polymer modified fog seals
- Control section using conventional materials

Pennsylvania

- SR 220 – Thin overlay with and without fibers (3.9 miles)
- SR 3010 – Microsurfacing using three systems
- SR 15 – Thin overlay asphalt rubber gap graded mix

Minnesota

MnRoad Showcase

Preservation on I-94 and Low-Volume Road Oval

- Next Generation Concrete Surface
- Microsurfacing
- Chip seal
- Cold weather approaches
- “Mumble strips”

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Phase I Outreach

- Workshops
- Showcases
- Peer exchanges
- Data collection guidelines
- Implementation guidelines
- Implementation tool
- Case studies
- Quarterly user calls
- Marketing products

Phase II

- 3 states selected
 - Washington
 - West Virginia
 - New Jersey
- Focus on internal training

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What is the *New Normal*?

- Preservation *on all candidate pavements* as standard practice
- Appropriate tools in the toolbox (i.e., “mix of fixes”)
- Longer lives (treatments and pavements)
- Good documentation
- Associated developments (e.g., training, specifications, improved design and construction, selection guidelines)

Next Steps

- Take stock of where we are and where we need to be
- Continue work with agencies to extend use of preservation, especially on HVR
- Update identified gaps... and close them

Links of Interest

- FHWA
https://www.fhwa.dot.gov/goshrp2/Solutions/Renewal/R26/Guidelines_for_the_Preservation_of_HighTrafficVolume_Roadways
- AASHTO
http://shrp2.transportation.org/Pages/R26_HighTrafficVolRoadways.aspx

Thank You!

Questions?

