Updated Guide for Concrete Pavement Preservation

SHRP2 R26 Workshop for the Preservation of High-Traffic Volume Roadways
Minneapolis, Minnesota
April 8, 2014

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Why Concrete Pavement!
Bellefontaine, Ohio 1925
Outline

• Introduction: Pavement Preservation
• Background: Concrete Pavement Preservation Guide
• Guide Contents and Highlights
• Status and Future Plans
Introduction: Pavement Preservation

• Proactive means of managing pavement condition (before severe deterioration occurs)
• Focus on extending pavement life and restoring functional condition
• Benefits:
  – Cost savings
  – Improved pavement conditions
  – Increased functional performance (e.g., smoothness, safety, noise)
  – Reduced environmental impacts

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Pavement Preservation Window

The graph illustrates the progression of pavement condition over time. The x-axis represents time, and the y-axis represents pavement condition, ranging from excellent to failed. The shaded area indicates the pavement preservation window, where preventive maintenance is most effective. The curve shows how pavement condition degrades over time, with different stages such as minor rehabilitation, major rehabilitation, and reconstruction identified. The graph emphasizes the importance of timely maintenance to prolong the life of the pavement.
Favorable Characteristics for Preservation

- Few or limited structural problems
- No materials-related distress
- Pavements in overall relatively good condition
Background: Concrete Pavement Preservation Guide

• Original manual developed 2008
• CP Tech Center (FHWA sponsorship)
• Recommendations on:
  – Pavement evaluation
  – Treatment application, design, construction
• Numerous workshops held throughout U.S., 2008-2013
• Need for updates/new information
New Preservation Guide

- CP Tech Center (FHWA sponsorship)
- Initiated June 2013
- Goals:
  - Update 2008 Guide
  - Incorporate recent developments
  - Expand certain topics
  - Add chapter on concrete overlays
- External review by broad Technical Committee

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<tr>
<td>Gina Ahlstrom</td>
<td>FHWA</td>
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<td>Thomas Van</td>
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<td>John Roberts</td>
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<td>SUDAS</td>
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## Chapters/Topics in Guide

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Guide Highlights
—Treatment Commentary—

• **Common Treatments**
  – Full-depth repairs
  – Dowel bar retrofit
  – Diamond grinding
  – Partial-depth repair
  – Joint sealing

• **Growing Treatments**
  – Cross stitching
  – Thin Concrete Overlays

• **Less Common Treatments**
  – Slab stabilization
  – Retrofitted edge drains

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Guide Highlights
—Partial-Depth Repairs—

• Removal and replacement of small, shallow areas of deteriorated concrete
• Expanded use as repair technique
• Greater use of milling for preparation
  – Productivity
  – Bonding
• New patching materials
Guide Highlights
—Full-Depth Repairs—

• “Workhorse” treatment
• Removal/replacement of concrete pavement at deteriorated joints/cracks
• Renewed focus on workmanship
  – Dowel bar installation
• Need for rapid opening times
  – Accelerated materials
  – Precast repairs
Guide Highlights
—Precast Concrete Repairs—

• Advantages
  – Better quality concrete
  – Controlled curing
  – Minimal weather impacts
  – Rapid opening

• Experience in CA, CO, MI, DE, MN, MO, TX, NJ, NY, IL, UT, VA

• Good performance to date
Guide Highlights — Utility Cut Repairs —

- Opening street to gain access to utilities
- On-going issue of returning pavement to good condition
- Guidance on:
  - Sizing cuts
  - Creating/removing
  - Jointing
  - Backfilling
  - Embedded steel
  - Opening to traffic
Guide Highlights
—Dowel Bar Retrofit—

• Installation of dowel bars in existing joints to improve load transfer
• Increased use on cracks
• Renewed focus on patching materials
  – Durability
  – Shrinkage

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Guide Highlights
—Cross Stitching—

• Accepted treatment for
  – Early longitudinal cracks in new construction
  – Longitudinal cracks in older pavements
  – Misaligned tie bars

• Advantages:
  – Quick and easy to install
  – Less intrusive

• Good performance
Guide Highlights

—Diamond Grinding—

• Removal of thin layer of concrete to restore smoothness
• Boon to concrete pavement preservation
• Diamond grinding texturing “families”
  – Conventional
  – City street
  – Texture grind
  – NGCS
Guide Highlights
—Next Generation Concrete Surface (NGCS)—

- Manufactured concrete pavement surface
- Uses conventional grinding equipment in two-phase operation
  - Flush grinding
  - Longitudinal grooving
- Low-noise surface
- New and rehabilitated pavements
Guide Highlights —Concrete Overlays—

- Thin concrete overlays for preservation improvements
- Bonded or unbonded
- 2 to 4 inches thick
What’s New

- Increased Importance Placed on PMS
- Inclusion of Chapter on Concrete Overlays
- Updated Equipment Technologies: GPR MIT SCAN, MIRA, etc
- Incorporated new PDR Techniques
- Inclusion of FHWA ASR Initiatives
- Inclusion of Precast Repairs, Utility Cuts, and CRCP Guidelines
- Emphasis on Noise Surface: NGCS
Status and Future Plans

• Guide Document
  – Materials completed and undergoing final reviews/publication
• Training Materials
  – Completed in May 2014
• Implementation Efforts (starting April 2014)
  – Regional workshops
  – On-demand web-based training
  – Contact: Dale Harrington, CP Tech Center

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Nine Months Goes By Soooo FAST

Panel Meeting Every Two Weeks
GUIDE FOR
PARTIAL-DEPTH REPAIR OF CONCRETE PAVEMENTS

IOWA STATE UNIVERSITY
Institute for Transportation

April 2012
And Now Ready For Implementation

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International Grooving & Grinding Association
Your Pavement Preservation Resource since 1972