Concrete Pavement Preservation Guide

Mid West Pavement Preservation Partnership

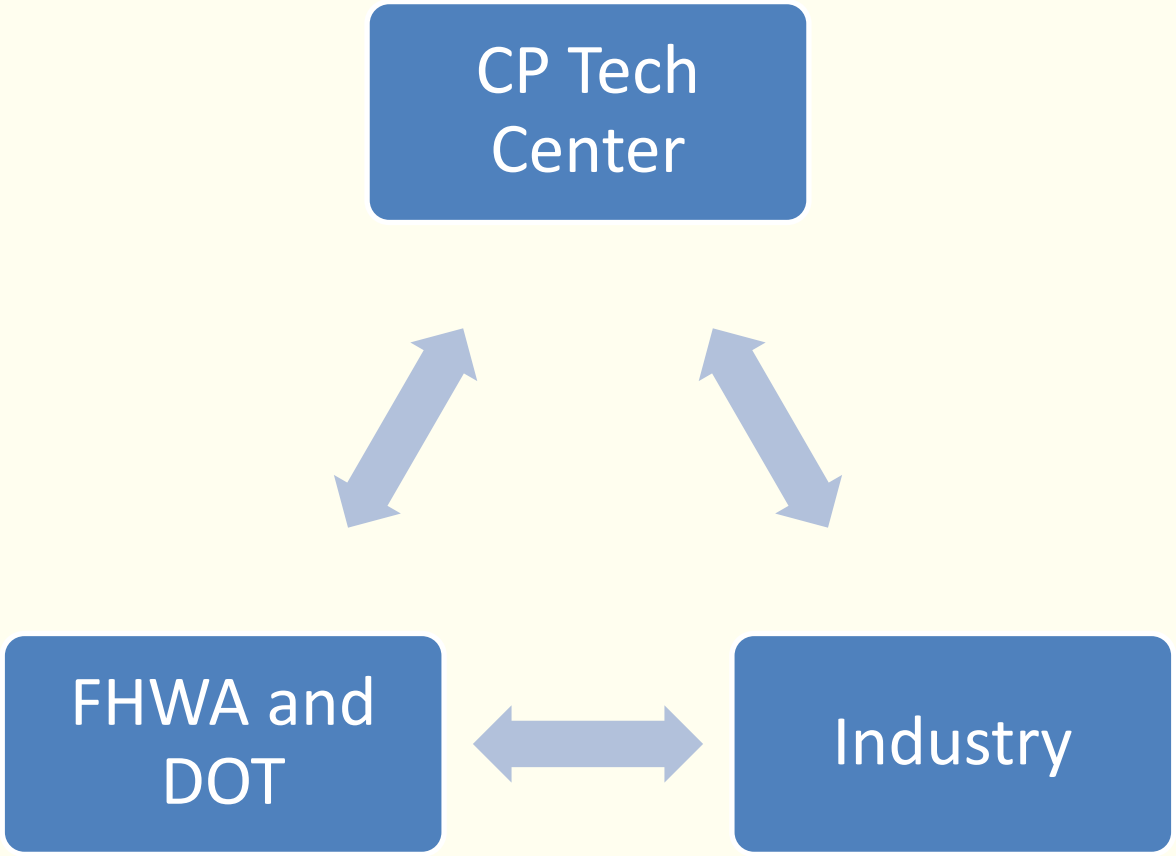
Kansas City, Missouri

September 28, 2015

TODD LATORELLA

Executive Director MO/KS Chapter, ACPA

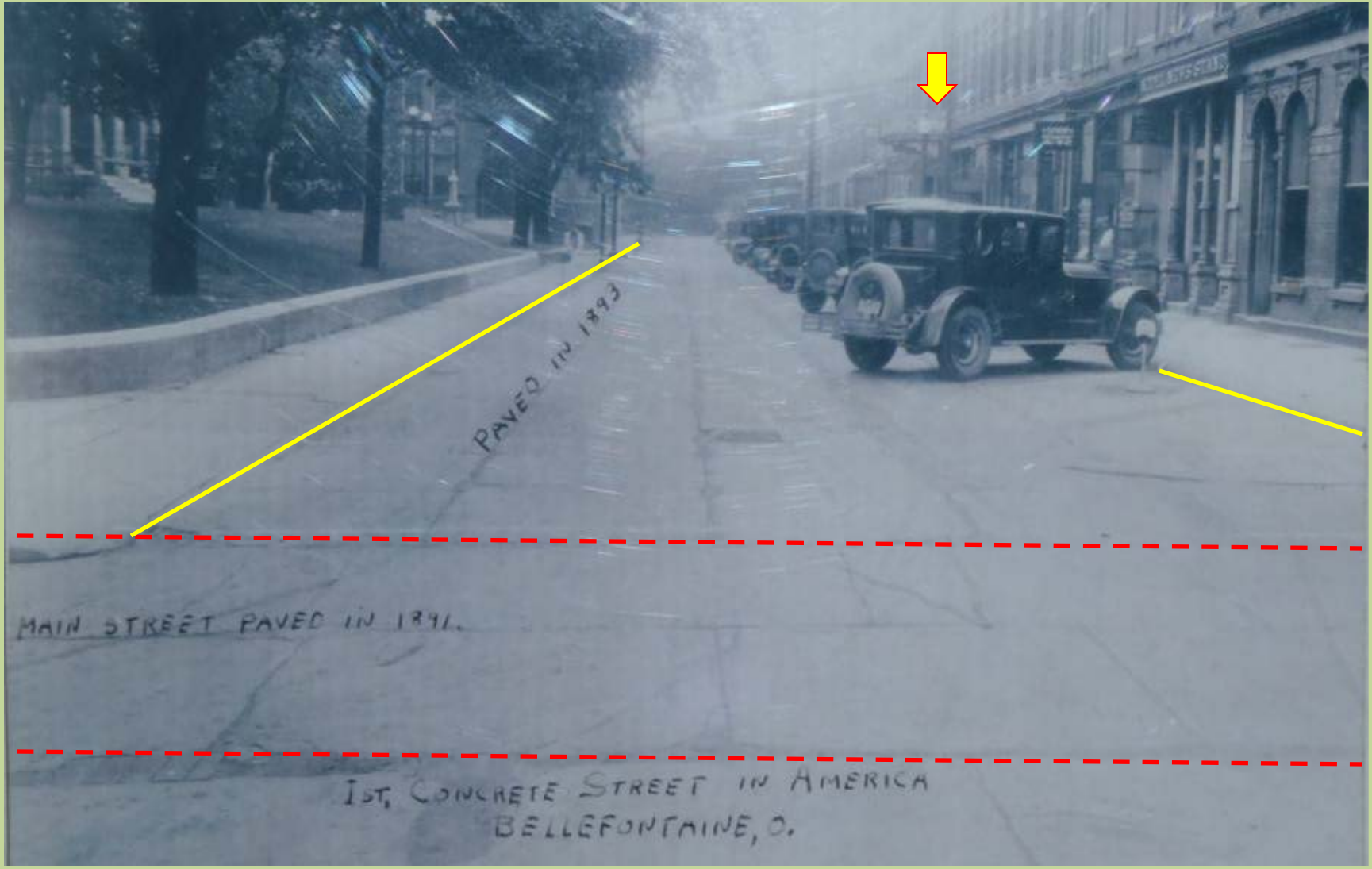
Course Developers



Kurt Smith
Applied Pavement Technology

Dale Harrington
CP Tech Center

Why Concrete Pavement !
Bellefontaine, Ohio 1925



Bellefontaine, Ohio 2012

122 Years Old

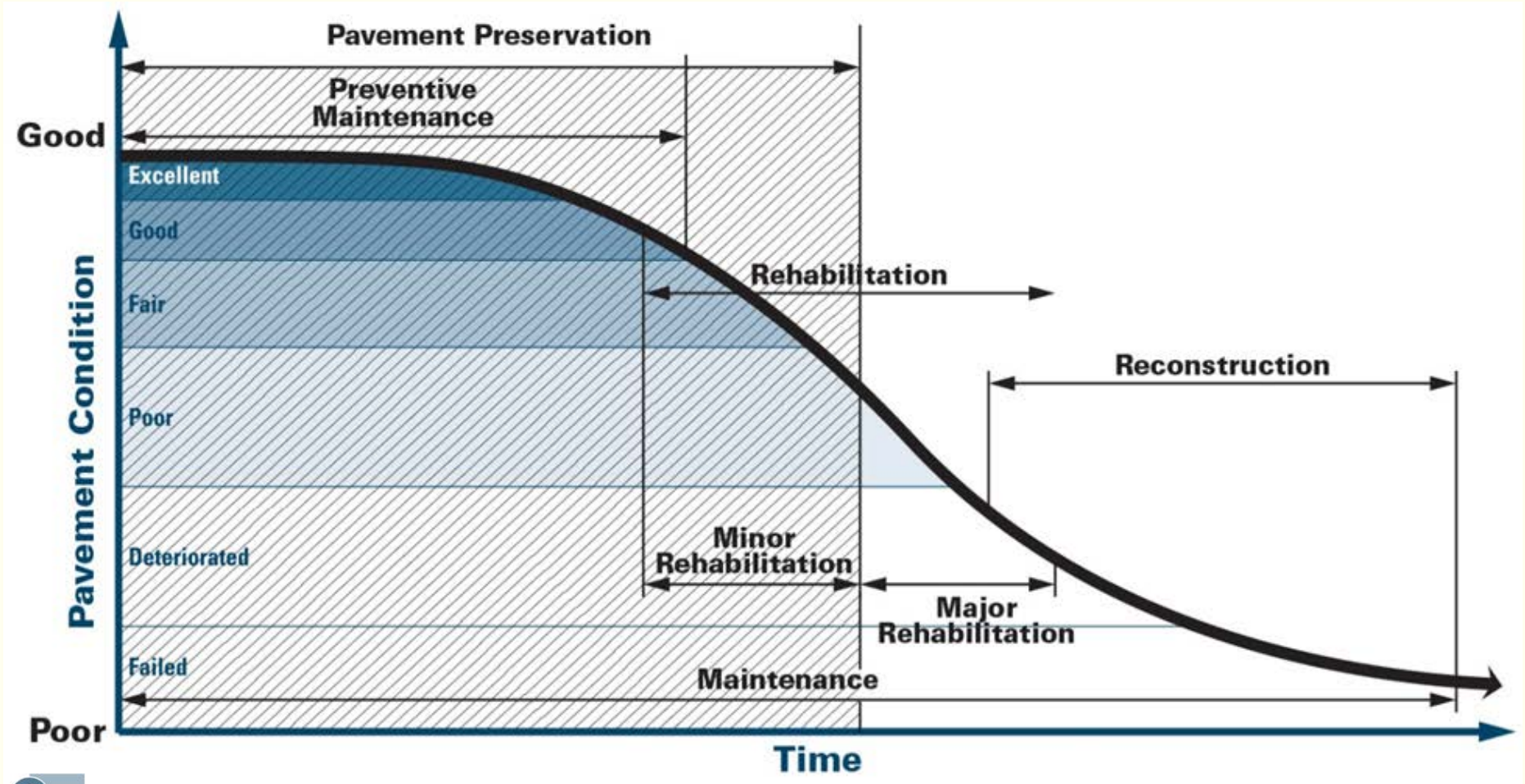
Presentation Outline

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

Introduction: Pavement Preservation

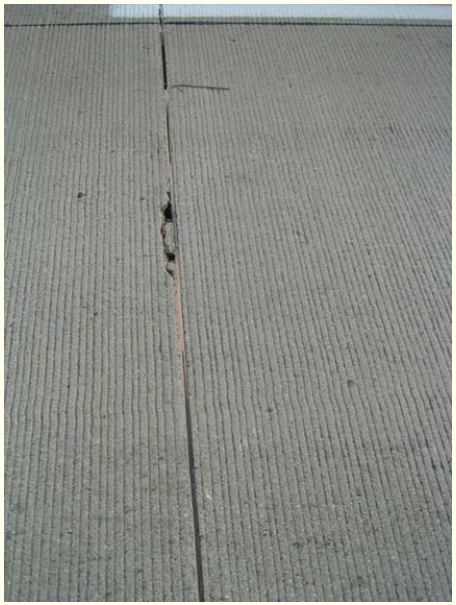
- Proactive means of managing pavement condition (before severe deterioration occurs)
- Focus on extending pavement life and restoring functional condition
- Benefits:
  - Cost savings
  - Improved pavement conditions
  - Increased functional performance (e.g., smoothness, safety, noise)
  - Reduced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

Pavement Preservation Window



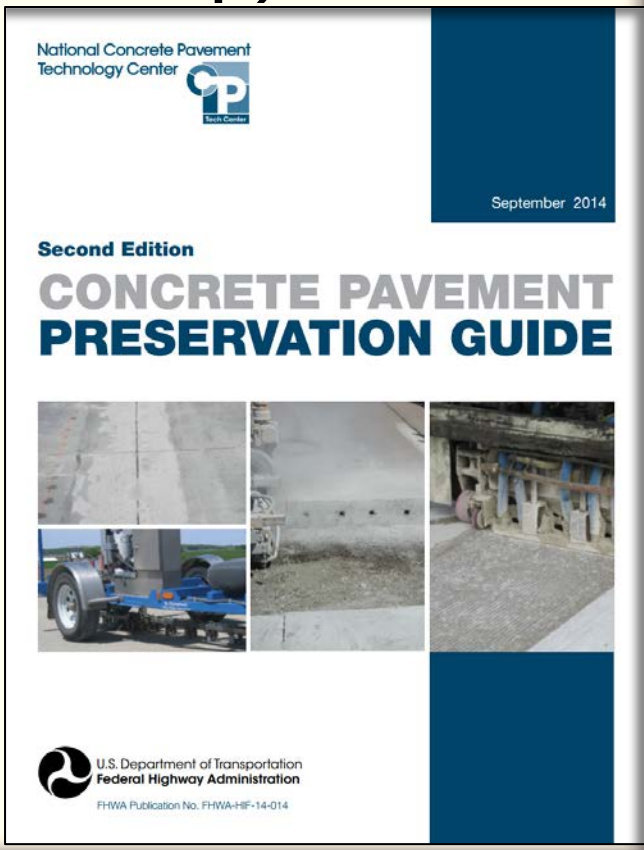
Favorable Characteristics for Preservation

- Few or limited structural problems
- No materials-related distress
- Pavements in overall relatively good condition



Background: Concrete Pavement Preservation Guide

- Original manual developed 2008 & updated in 2014
- CP Tech Center (FHWA sponsorship)
- Recommendations on:
  - Pavement evaluation
  - Treatment application, design, construction
- 13 state DOT workshops held throughout U.S., 2014-2015



New Preservation Guide

- CP Tech Center (FHWA sponsorship)
- Goals:
  - Update 2008 Guide in 2014
  - Incorporate recent developments
  - Expand certain topics
  - Add chapter on concrete overlays
- Published September 2014

Technical Committee

Organization	Number of Participants
FHWA	2
State DOTs	5
Industry	9
University	2

Chapters/Topics in Guide

1. Introduction
2. Pavement Preservation Concepts
3. Concrete Pavement Evaluation
4. Slab Stabilization
5. Partial-Depth Repairs
6. Full-Depth Repairs
7. Retrofitted Edge Drains
8. Dowel Bar Retrofit
9. Diamond Grinding and Grooving
10. Joint Resealing and Crack Sealing
11. Concrete Overlays
12. Strategy Selection

Guide Highlights
—Treatment Commentary—

- **CommonTreatments**
  - 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

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—

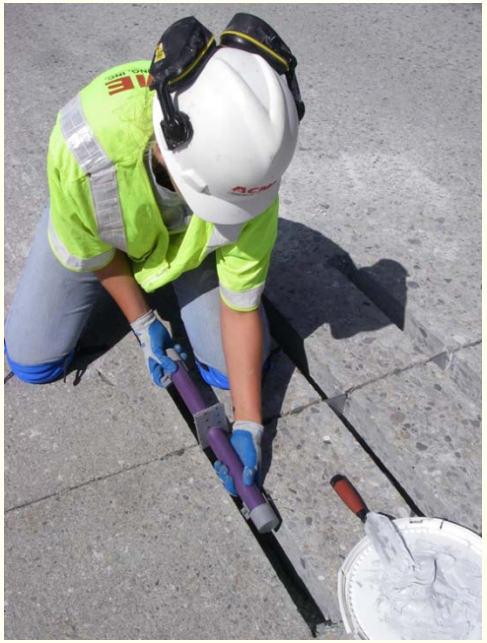
- Advantages
  - Better quality concrete
  - Controlled curing
  - Minimal weather impacts
  - Rapid opening
- Experience in CA, CO, DE MI, MN, MO, NJ, NY IL, TX, UT, VA (add KS)
- Good performance to date

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

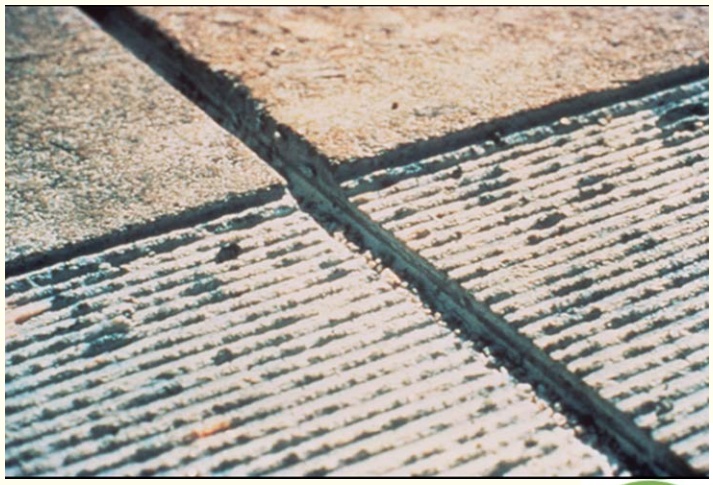


Guide Highlights
—Cross Stitching—

- 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—

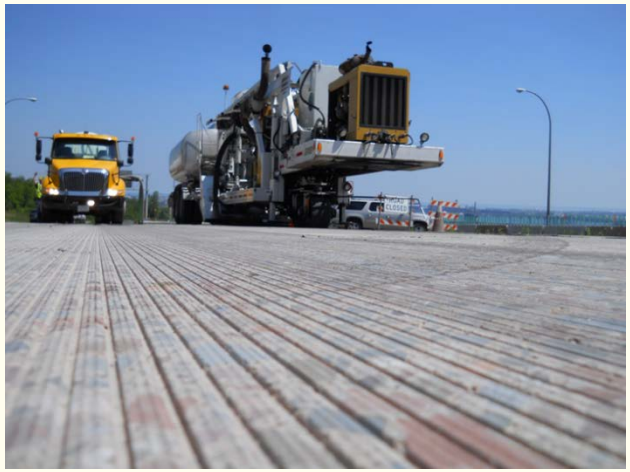
- Removal of thin layer of concrete to restore smoothness
- Boon to concrete pavement preservation
- Diamond grinding texturing “families”
  - Conventional
  - City street
  - Texture grind
  - NGCS



Guide Highlights

—Next Generation Concrete Surface (NGCS)—

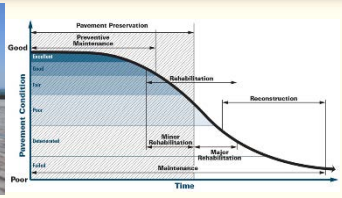
- Manufactured concrete pavement surface
- Uses conventional grinding equipment in two-phase operation
  - Flush grinding
  - Longitudinal grooving
- Low-noise surface
- New and rehabilitated pavements



Guide Highlights
—Concrete Overlays—

- Thin concrete overlays for preservation improvements
- Bonded only
  - 3 to 4 inches thick (preservation)
- Unbonded
  - 4 inches ≥ 6 inches (minor rehabilitation)
  - ≥ 6 inches (major rehabilitation)


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

And Now Ready For Implementation

Planned CP Tech Center Pavement Preservation Workshops

Date	Location
October 5-8, 2015	Northern California
October 20, 2015	Illinois
October 19-22, 2015	Southern California
November 4-5, 2015	Nebraska
December 14-17, 2015	North Dakota
March 28-31, 2016	State of Washington

Web Based Training Module

Other Resources

IOWA STATE UNIVERSITY
Institute for Transportation

National Concrete Pavement Technology Center

Tech Center

Who We Are | Technical Library | Research | Events | Search

CP Tech News

» Leading a performance-based approach to designing concrete for pavements *Jul 20, 2015*

» Register for the Fall 2015 TTCC/NCC Meeting *Jul 14, 2015*

Technology Deployment Opportunities and Resources

CP Tech Center Training Topics

CP Tech Center Recent Publications

Technology Deployment Program

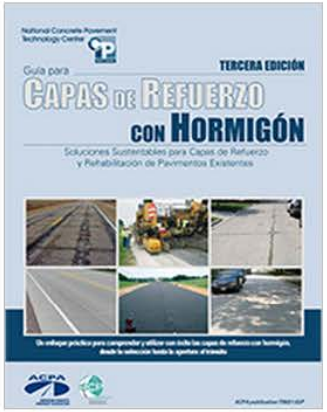
Concrete Overlay Workshop

- About the Workshop
- Resources

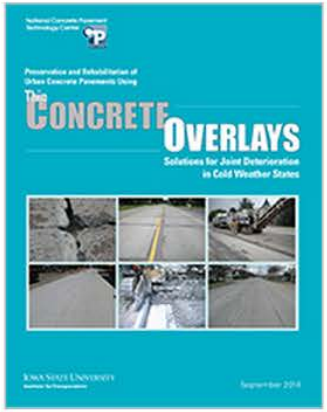
Pavement Preservation Workshop

- About the Workshop
- Resources

Featured Research and Publications



2014 – Guia para Capas de Refuerzo con Hormigon: Soluciones Sustentables ...



2014 – Preservation and Rehabilitation of Urban Concrete Pavements Using ...

NCC NATIONAL CONCRETE CONSORTIUM

CP ROAD MAP it's your move!

CP Tech Center

Manuals and Guidelines

Concrete Pavement Preservation Guide (2nd edition), 2014

Preservation and Rehabilitation of Urban Concrete Pavements Using Thin Concrete Overlays: Solutions for Joint Deterioration in Cold Weather States, 2014

Guide for Partial-Depth Repair of Concrete Overlays, 2012

Guide to Concrete Overlays: Sustainable Solutions for Resurfacing and Rehabilitating Existing Pavements (3rd edition), 2012

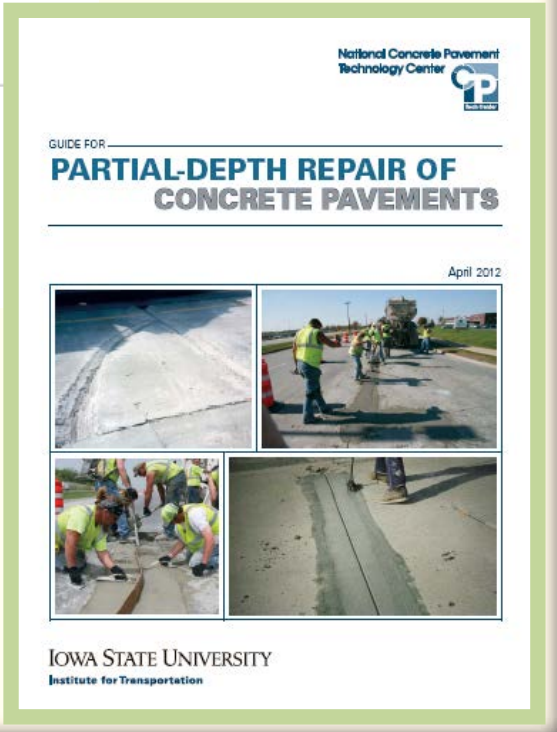
Integrated Materials and Construction Practices for Concrete Pavement: A State-of-the-Practice Manual, 2007

Reports

Long-Life Concrete: How Long Will My Concrete Last?, 2013

Concrete Pavement Surface Characteristics: Key Findings and Guide Specifications, 2012

Rehabilitation of Concrete Pavements Utilizing Rubblization and Crack-and-Seat Methods, 2008



National Center for Pavement Preservation

Michigan State University

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The National Center for Pavement Preservation (NCPP) was established by **Michigan State University** and **FP2, Inc.** to lead collaborative efforts among government, industry, and academia in the advancement of pavement preservation by advancing and improving pavement preservation practices through education, research and outreach.

Research Roadmap Database

TSP2 Pavement & Bridge Partnerships

Equipment Management Partnership

NCPP Hosted Conferences and Meetings

Technical Video Library

Pavement Preservation Councils

Pavement Preservation Classes

Transportation News

Upcoming Events

Concrete Pavement Repairs

Joint Repairs

Presentation Title	Presenter	Date	PDF
Joint Distress in Portland Cement Concrete Pavements	Larry Sutter	Aug-12	
Role of Joint Seal Effectiveness in Concrete Pavement Performance & Rehabilitation	Dan Zollinger	Aug-12	
Joint Resealing on PCC Pavements	Rick Stone	Nov-10	

Diamond Grinding & Texturizing

Presentation Title	Presenter	Date	PDF
Innovative Textures	Larry Scofield	Sep-14	
Diamond Grinding: Overview of Pavement Performance in Texas	Feng Hong	May-13	
Diamond Grinding	Matt Ross	Aug-12	

Dowel-Bar Retrofit

Presentation Title	Presenter	Date	PDF
Dowel-bar Retrofit Using Polyester Polymer Concrete	Shakir Shatnawi	Aug-12	

Full & Partial Depth

Presentation Title	Presenter	Date	PDF
Precast Concrete Pavements	Shiraz Tayabji	Apr-14	
Partial Depth Concrete Patching	Robert Blight	Apr-14	
Preservation of Rigid Pavement - Full Depth and Partial Depth Repairs	Moon Won	May-13	
Pavement Preservation with Thin Lift Concrete Overlays	Dale Harrington	Aug-12	
Urban Slab Replacement	Craig Hennings	Aug-12	
The Whitetopping Rehabilitation Alternative	Jim Cable	Oct-09	
Concrete Slab Jacking and Stabilization	Andy Bennett	Oct-10	

Thank You!

ACPA
Missouri/Kansas Chapter

IGGA
International Grooving & Grinding Association
Your Pavement Preservation Resource since 1972