

2023 NCPP–Conference Summary

Impacts and Benefits From Pavement Preservation

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9–21–23

National Pavement Preservation Conference

npcc23

IMPACTS AND BENEFITS FROM PAVEMENT PRESERVATION
September 18-21 • J.W. Marriott Hotel • Indianapolis, Indiana



MICHIGAN STATE
UNIVERSITY

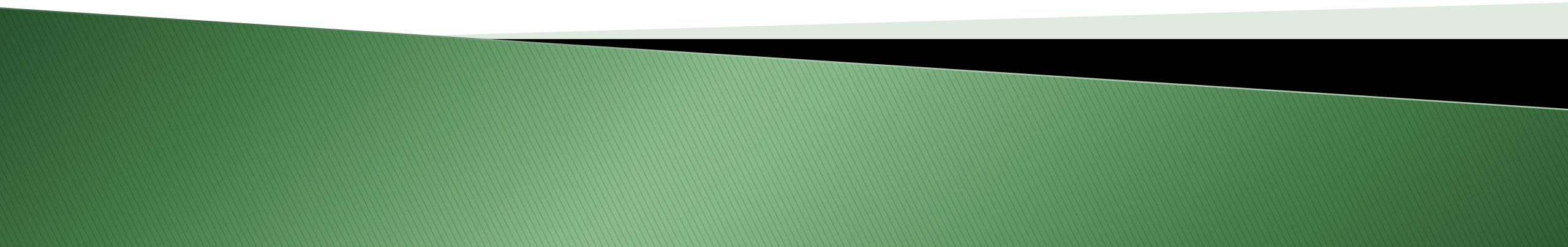


Presentation Outline

- ▶ History of preservation
- ▶ Conference sessions
- ▶ Types of preservation treatments
- ▶ Benefits
- ▶ Challenges and opportunities
- ▶ Conference takeaways
- ▶ Moving forward



History of Pavement Preservation



History Prior to 1992

- ▶ Most current preservation treatments were called maintenance
- ▶ Reactive, not proactive or preventive
- ▶ More art than science
- ▶ Since then:
 - Materials have changed
 - Equipment has changed
 - Design practices—not so much
 - QA practices still need improvement

Preservation History Since 1992

- ▶ FPRMR established in 1992
- ▶ Early players
 - Industry–Bill Ballou and Michael O’Leary (Koch Materials) and Bob Province and Mike Buckingham of ISSA
 - FHWA–Jim Sorenson
 - Consultant– Jim Moulthrop
 - Academia–Gary Hicks
- ▶ Changed to FP2 Inc in 1999 and reorganized again in 2009

Early Challenges

- ▶ Preservation did not fit the highway bill as it was considered maintenance
- ▶ Many HMA contractors did not support it



Jim Sorenson
1949–2009
Persistence paid off

Other Efforts

- ▶ Lobbying to enhance visibility/importance
- ▶ Support for the National Center at Michigan State Univ.
- ▶ Implementation
 - International Conference–2010
 - National conferences–2016, 2023
 - Regional Partnerships
 - AASHTO TSP–2 program



Moulthrop



Galehouse and Corley Lay

Current Efforts

- ▶ NCPP and the Pavement Preservation Partnerships
- ▶ FP2
- ▶ ACPA/IGGA
- ▶ NAPA/TAI/NCAT/MnRoad
- ▶ FHWA/PPRA
- ▶ AASHTO COMP and COM
- ▶ TRB
- ▶ NACE/APWA
- ▶ CP2 Center
- ▶ WRAPP



Bouzid Choubane
NCPP



Rich Church
FP2

2023 Conference Sessions

1. Fundamentals

- a. Pavement preservation
- b. Asphalt emulsion basics
- c. Establishing and effective preservation programs
- d. National databases

2. Materials and treatments

- a. Use of asphalt emulsions
- b. Concrete preservation
- c. EPD's
- d. Recycling

3. Advancing the practice

- a. Workforce development
- b. Training
- c. Sustainability

1. 4. Data and Analysis

- a. Pavement condition data
- b. Pavement management
- c. Safer pavements
- d. Performance

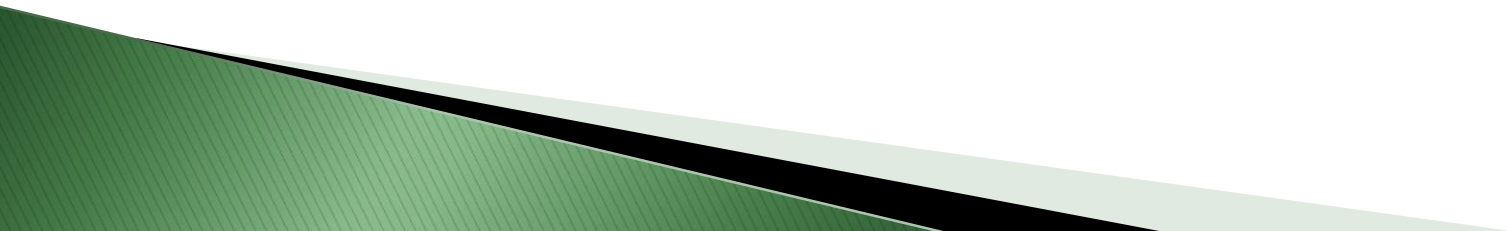
5. Test roads

- a. NCAT
- b. MnROAD
- c. Indiana Local Roads

6. Moving ahead

- a. FHWA strategic plan
- b. TSP-2 Oversight
- c. Regional Partnerships

Preservation Treatments



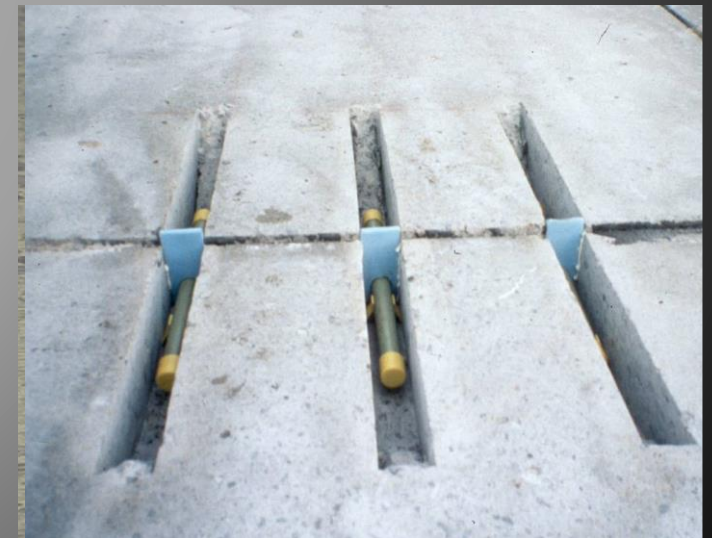
Treatments Commonly Used for Asphalt Pavements

- ▶ Crack sealing
- ▶ Fog seals
- ▶ Chip and Scrub seals
- ▶ Slurry seals and Micro surfacing
- ▶ Cape seals and multilayer systems
- ▶ Thin bonded wearing courses
- ▶ Thin HMA overlays
- ▶ In-place recycling (CIR and HIR)



Treatments Commonly used for Concrete Pavement Preservation

- ▶ Crack sealing and joint refilling
- ▶ Diamond grinding and grooving
- ▶ Dowel Bar Retrofit
- ▶ Cross stitching and slot stitching
- ▶ Partial depth repair
- ▶ Full depth repairs
- ▶ Bonded concrete Overlays



Benefits Of Pavement Preservation

- ▶ Cost effectiveness
- ▶ Energy savings
- ▶ Reduced emissions
- ▶ Reduced user costs
- ▶ Life extension
- ▶ Sustainability



Keys to Success for All Treatments

- ▶ Project selection (PCI vs distress) and quality materials
- ▶ Pre-job meeting
- ▶ Quality Assurance
 - QC plan
 - Agency inspection
- ▶ Effective communication and thorough documentation



Challenges and Opportunities



Challenges to Increased Use

- ▶ Clearly documenting the benefits
- ▶ Shift from worst first to preserving good pavements
- ▶ Selecting the proper strategy and using best practices
- ▶ Adopting good QA practices and testing
- ▶ Lack of national specifications for most products
- ▶ Keeping preservation champions
- ▶ Workforce development and continuous training

Shift from Worse First to Pavement Preservation

- ▶ Convincing the public and the politicians to spend maintenance \$\$\$ on good roads
- ▶ Clearly communicating the benefits of preservation strategies
- ▶ Documenting that a mix of fixes results in the best network condition

Using Best Design and Construction Practices

- ▶ Strategy selection
 - Right road
 - Right treatment
 - Right time
- ▶ Mix design
 - Art not science
 - Need for improved performance tests
- ▶ QC and acceptance testing
 - Does not yet meet HMA or PCC practices
 - Tests on components and not the mix
- ▶ Agency's do not get what they spec, but get what they inspect

Need for QC Plan

- ▶ System used by a Contractor to monitor, assess, and adjust their production or placement processes
- ▶ Ensures project will meet specified level of quality



Agency Acceptance

➤ Inspection

- Pre- job meeting,
- Surface prep, equipment calibration, proper equipment, application rates

➤ Sample and test at discretion of the Agency

- Emulsion
- Aggregate
- Mix

➤ Where? How? Frequency? Quantities?



Opportunities

- ▶ Gotta do better
- ▶ Still too many failures with some of the treatments.
 - Need to control the factors affecting the field performance
 - Need certified contractors and agency inspectors
 - Need to document the performance of various the treatments
 - Workforce development is important
 - Training at all levels is needed

National Efforts to Address The Challenges

- ▶ FHWA EDC studies
 - When
 - What
 - How
- ▶ FHWA TFG on Pavement Preservation
 - Promoting preservation practices
 - Implementing new technologies, specifications, and construction guides
- ▶ AASHTO TSP-2-Emulsion Task Force (ETF)
 - Materials specs
 - Design practices
 - Construction guides including QA
 - Best Practices

Recent Research to Address the Challenges

- ▶ NCHRP projects 14-33 and 14-38 on benefits of pavement preservation
- ▶ NCHRP project 14-37: Construction guides for chip seals and microsurfacing
- ▶ NCHRP project 14-44: Construction guides for Slurry seals, scrub seals and tack coats
- ▶ NCHRP study 9-63: Performance graded emulsions
- ▶ NCHRP Project 14-43 Construction guide specs for cold in place recycling
- ▶ NCHRP project 14-48: Construction guides for sand seals and Thin Bonded Wearing Courses
- ▶ NCHRP project 10-114: Emulsion based rejuvenating seals

Web Resources for Asphalt Pavement Preservation

- ▶ FP2 Inc–www.fp2.org
- ▶ FHWA–www.fhwa.dot.gov/pavement/pres.cfm
- ▶ NAPA–www.asphaltpavement.org
- ▶ NCPP–www.pavementpreservation.org
- ▶ AASHTO–www.tsp2.org
- ▶ CP2 Center–www.csuchico.edu/cp2c
- ▶ PPRA–<https://roadresource.org>
- ▶ WRAPP–<https://wrapp.org>

Web Resources for Concrete Pavement Preservation

- ▶ Iowa State University

https://intrans.iastate.edu/app/uploads/2022/08/concrete_pvmt_preservation_guide_3rd_edition_web.pdf

- ▶ IGGA

<https://www.igga.net>

- ▶ ACPA

<https://www.acpa.org/tag/pavement-preservation/>

- ▶ FHWA

<https://www.fhwa.dot.gov/pavement/pubs/hif18025.pdf>

Takeaways from the Conference

Takeaways

- ▶ Come a long way in the past 25+ years
- ▶ Preservation is now a common practice in the USA
- ▶ Many agencies have improved their overall network condition using a mix of fixes using their PMS and improved data collection.
- ▶ Must continue to improve our practices and technologies to increase use of preservation treatments
- ▶ Doing more with less. The fiscal cliff we are on needs to be resolved soon.

More Takeaways

- ▶ Performance and cost benefits of preservation treatments are being documented
- ▶ Technology for mix design and performance testing for some treatments needs to be improved
- ▶ QA practices for preservation treatments need to be implemented
- ▶ Providing continuous education on how to design, place, and inspect successful preservation treatments is underway
- ▶ Need to calculate EPD's for preservation treatments. Greenhouse emissions must be reduced for preservation treatments

Moving Forward

- ▶ Encourage adoption of AASHTO materials specs, design practices, and construction guides
- ▶ Encourage improved QA practices including training and certification
- ▶ Fully incorporate pavement preservation into PMS and agency business practices
- ▶ Preservation budgets are not keeping up with inflation. Need to “show-off” successful case histories
- ▶ Continue to promote and expand the Regional Partnerships

Thank You Very Much

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