PRESERVING OUR NATION’S TRANSPORTATION INFRASTRUCTURE - UPDATES & TRENDS

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Quick Facts on NCPP

- Established in 2003 through collaborative efforts of MSU, FHWA, and FP2 Inc.
- Mission is to provide outreach, education, & research needed to advance state of preservation practice and knowledge.
  - Initially dealt with pavement preservation
  - Today, portfolio includes:
    - Pavement and bridge equipment
    - Pavement Preservation Certification Program.
QUICK FACTS ON NCPP (con’t)

Currently also administering pavement and bridge preservation technical services programs (TSP-2) and the equipment management technical services program (EMTSP) for AASHTO.
Principal Mission: Serve as clearinghouse for information on preservation measures that enhance transportation infrastructure performance and extend their service life.

Endgame: Advance the state of the practice and knowledge for preserving our nation’s transportation infrastructure.
TSP2 Regional Preservation Partnerships

Bridge:

- Midwest
- Northeast
- Southeast
- Western

Pavement:

- Midwestern
- Northeast
- Rocky Mountain West
- Southeast
TSP2 Task Forces / Working Groups

From time to time, Task Forces or Working Groups may be formed to perform other actions which promote the objectives of the Partnership.

- Emulsion Task Force (ETF)
- Concrete Task Force (CTF)

*The Task Forces, their activities, and deliverables, are listed on the TSP•2 website.*
NCPP Overarching Objective:

- Ensure mission of TSP•2 program effectively and efficiently achieved.
  - Provides technical, logistics, & administrative support.
  - Facilitates regional partnership activities,
  - Provide effective interactive websites,
  - Offers other assistance as needed or requested.
TSP2 Regional Preservation Partnerships (Con’t)

- Outreach: Facilitate Exchange of Preservation Information

4 Regional Partnerships
- Monthly Teleconference Meetings
  - Business
  - Technical Presentations/Discussion
    - Innovative Products/Practices
    - Preservation Challenges
    - Best Practices
- Annual Regional Meetings
- National Preservation Conference
  - Every 4 years (or so . . .)
2022 Annual Regional Pavement Partnership Meetings

SEPPP - Southeast Pavement Preservation Partnership
Jekyll Island, GA - March 28-30

NEPPP - Northeast Pavement Preservation Partnership
Portsmouth, NH - May 3-5

MPPP - Midwest Pavement Preservation Partnership
St. Louis, MO - September 12-14

RMWPPP- Rocky Mountains West Pavement Preservation Partnership, Albuquerque, NM - September 27-29,
2023 National Pavement Preservation Conference

National Pavement Preservation Conference

PAVEMENT PRESERVATION: MAKING THE RIGHT CHOICES

September 18-21 • J.W. Marriott Hotel • Indianapolis, Indiana

Featuring:

• Live Treatment Demonstrations, Equipment Parade, and Pre-staged Treatment Displays
• Four Concurrent Technical Tracks Covering a Variety of Preservation Topics
• Networking Opportunities with Fellow Practitioners and Exhibitors
PRESERVING OUR NATION’S TRANSPORTATION INFRASTRUCTURE

CONTEXT & QUICK FACTS

- Transportation Infrastructure is essential to:
  - Commute to work,
  - Obtain/deliver goods and services,
  - Visit with family and friends,
  - Travel both for leisure and work, etc.
QUICK FACTS

- Some statistics, from the 2020 USDOT Transportation Statistics Annual Report (1):
  - Connects 7.9M businesses with customers, suppliers, and workers.
  - Served 327M residents and 80M visitors.
  - Transportation assets valued at about $8.3 trillion

Public highways & streets accounted for ~ 45% or $3.7 trillion
Other publicly owned transportation, such as airports, seaports, and transit structures, accounted for $861 billion.
QUICK FACTS (con’t)

- The National Highway System consists of about 4.2 million center-line or 8.8 million lane-miles and more than 617K bridges.
- Close to 70% of the roadways are Local roads.
- About 1% of total system-miles are highways handling more that ¼ of total traffic volumes.
- 273.6 million motor vehicles drove a total of more than 3.2 trillion miles
  - Commercial vehicles (trucks & buses) use accounted for about 10% of VMT
Pavement Preservation

Programs and Activities using a network level, long-term strategy that includes integrated, cost-effective set of practices that extend pavement life, improve safety, and meet road user expectations.
WHY PRESERVATION?

- Fundamental need to preserve transportation assets.
- Public agencies mission to provide a safe, efficient, resilient, and durable infrastructure.
- Ultimately, it is about economics:
  - Significant reduction in construction and management costs.
  - Fewer traffic delays and negative impact on traveling public.
  - Time-efficiency and cost-effectiveness to optimizing service.
- It is better for the Environment as well:
  - It typically uses up to 80% less of natural non-renewable resources.
  - Extending pavement life through preventative strategies can reduce greenhouse gasses by up to 2% *

* Preliminary data
WHY PRESERVATION? (con’t)

- In addition, with the implementation of performance measures through MAP-21 and the Fast Act, states are required to develop a risk-based asset management plan to improve or preserve the condition and the performance of their transportation assets.
  - Held accountable for the condition of their transportation infrastructure.
  - Preservation is the most cost-effective approach to improve and maintain the state of good network condition.
- In light of the Bipartisan Infrastructure Law (BIL), the need to preserve our investment and ensure a resilient transportation infrastructure has never been greater.
State of Knowledge of Emulsion-based Treatments (Based on 162 Responses)

- **Chip Seals**
  - High (108): 67%
  - Marginal (36): 22%
  - Low (18): 11%

- **Micro Surfacing**
  - High (40): 25%
  - Marginal (63): 39%
  - Low (59): 36%

- **Fog Seals**
  - High (14): 9%
  - Marginal (63): 39%
  - Low (85): 52%
Pavement Preservation – Trends & Updates

For several years, the TSP2 Regional Pavement Preservation Partnerships have been working with their member states to increase awareness, adoption, and use of Pavement Preservation programs.

4 major focus areas:
- Certification and Lab Accreditation
- Updated Specifications
- Focused Training and Education
- Research and Testing of Materials and Processes
Certification

- NCPP collaborated with its stakeholders to develop a certification program that combines education and testing. It covers:
  - Individuals - Agency and Contractor
  - Contractor
  - Agencies
- Separate certification for contractor and agency personnel.
- Testing can be completed in-person at a proctored site or on-line.
- Spanish-version available.
- First group of individuals was certified in 2016.
32 Labs have been accredited since 2016. More are in the queue for 2023.

Working with AASHTO:resource (formerly AMRL) to develop accreditation standards for slurry surfacing design labs.
New Specifications

- AASHTO Specifications and Construction Guides approved and published in 2022 for:
  - Micro surfacing, Chip Seals and Fog Seals.
  - Diamond Grinding.

- Additional Specifications are in development for other treatments.

- Draft QA/QC Guides for Chip Seal and Slurry Systems are at the review stage for publication.

- Polymer Modified Slurry Seals
  - Recently approved, this new Specifications and construction guide bridge the gap between standard Slurry Seal and Micro surfacing.

- On-going efforts to harmonize AASHTO and ASTM standards
Ongoing Research

NCAT/MnROAD - Pavement Preservation Group Study

- To quantify service-life extension and condition-improving benefits of different pavement preservation treatments on low-volume and high-volume roads in both northern and southern climates.
- Test Sections have been placed at various locations in Alabama and Minnesota.
- Most of the preservation treatments are out-performing expectations after 10-years of service.

More information can be found at: Pavement Preservation (auburn.edu)
Ongoing Research

Micro Surfacing Sampling and AC Content Determination

Objectives

✓ Develop a field sampling procedure
✓ Test method to determine the asphalt binder content in a slurry surfacing system.

Research is complete and under review. Expect publication in 2023.

Illinois DOT – Asphalt Content in Micro surfacing Mixtures
Ongoing NCHRP Projects

- NCHRP 14-43 Construction Guide Specifications for Cold Central Plant Recycling and Cold In-Place Recycling
- NCHRP 10-144 Developing Performance and Safety Specifications for Rejuvenating Seals.
- NCHRP 10-124 Development of Field Test to Determine Actual Percent Embedment of Chip Seal Aggregate.
NCHRP 20-44(26) Implementing Guide Specifications for the Construction of Chip Seals, Micro Surfacing, and Fog Seals

- **Background**
  - Initial Construction Guide Specifications developed through NCHRP 14-37.
  - These specifications adopted as AASHTO Provisional Standards.

- **Project Objective**
  - Develop and execute a dissemination and implementation plan to generate awareness of these Construction Guides.
IMPLEMENTATION PLAN

Implementation effort consists of 5 tasks:

1. Information Dissemination
2. Outreach
3. Training
4. Demonstrations
5. Final Report
Educational Opportunities

RoadResource.org

All things Pavement Preservation from PPRA (Pavement Preservation and Recycling Alliance).

Website includes:

- Detailed Information on 18 Preservations treatments.
- Network Optimization Calculators that help prove the benefits of preservation using YOUR data.
- Treatment Selection based on:
  - Distress
  - Pavement Criteria
Educational Opportunities

Development of university level class modules on pavement preservation.
Other Governmental Initiatives
Infrastructure Investment & Jobs Act (IIJA) (aka Bipartisan Infrastructure Law or BIL)

- Signed into law - Nov 15, 2021
- Scheduled to go into effect - May 14, 2022
  - 6 months waiver issued – New implementation Nov. 10, 2022
  - Numerous requests to delay further
- IIJA total budget: $1.2 Trillion total
  - Original bill - $547 billion
  - Amended bill – 1.2 trillion
  - Roads & Bridges~ 10%
IIJA

- Roads/Bridges: $110 Billion over five years
  - 35% increase over baseline spending for roads
  - 39% of that will be distributed through discretionary grants
  - Additional research funding to current research programs
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Bill allocations for local agencies

Local agencies have the opportunity to access funds through:
• Competitive grants
• Sub-allocations based on the state’s population
• Federal formulas
PRESERVATION & RESILIENCY/SUSTAINABILITY

- Growing emphasis on making infrastructure more sustainable and resilient.
- Preservation essential to sustainability and resiliency of our transportation infrastructure
- Proper and appropriate timing of preservation treatments key to optimizing sustainability and resiliency benefits
  - Extending pavement service life
  - Lessens amount of new construction or reconstruction
  - Less material mining, acquisition, processing, and hauling
  - Reduces congestion and impact to traveling public due to construction delays
    - **Ultimately reducing vehicle greenhouse gas emissions.**
    - **FHWA issued guidance clarifying that sustainable pavements and construction materials are eligible/preferred for funding as part of its Carbon Reduction program**
Buy Clean Provision

Federal Sustainability Plan and Executive Order 14057 established a Buy Clean Task Force and initiative to promote use of low-carbon, made in America construction materials.

The Buy Clean Task Force is charged with developing recommendations on policies and procedures to include:

- Identifying materials as well as pollutants to prioritize for consideration in Federal procurement and federally-funded projects;
- Increasing the transparency of embodied emissions through supplier reporting, including incentives and technical assistance to help domestic manufacturers better report and reduce embodied emissions; and,
- Launching pilot programs to boost federal procurement of clean construction materials.
Buy Clean Provision

- State and local agencies to establish targets on:
  - Declining carbon dioxide targets and
  - On-road reductions as part of their performance measures.
- Funding, at some level will be directly tied to environmentally friendly construction processes.
- Inflation Reduction Act passed recently set $250 million for assistance in developing Environmental Product Declarations (EPDs) for construction materials.
Buy Clean Provision

$4.5 billion allocated to the General Services Admin, Department of Transportation, & Environmental Protections Agency.

- Designate construction materials & products that produce sustainably lower levels of greenhouse gases
- Incentives for low carbon materials
- Prioritize purchase of materials that have lower levels of GHG emissions
Build America-Buy American Act (BABA)

Application of Buy America Preference

• SEC. 70914 of the Bipartisan Infrastructure Law (BIL)

(a) IN GENERAL. – Not later than 180 days after the date of enactment of this Act, the head of each Federal agency shall ensure that none of the funds made available for a Federal financial assistance program for infrastructure, including each deficient program, may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States. (emphasis added)
Equity & Pavements

• Conditions of pavements tend to be worse in Communities with Higher Percentages of Underserved Racial and Ethnic Populations, Communities with Higher Rates of Family Poverty, and Urban Areas

• FHWA urged to better-examine pavement condition in local, rural & urban areas where improvement is needed.

• US Department of Agriculture department released $71 million in grants in pursuit of ‘equality and justice’
Equity & Pavements

Neighborhoods with a low percentage of underserved racial and ethnic populations have a higher percent chance of having good road conditions.

Probability of having good road conditions

22% chance of good pavement

7% chance of good pavement

Low percentage of underserved

High percentage of underserved

Census tract percentage of underserved racial and ethnic populations

- Small town (rural)
- Suburban
- Large town (rural)
- Urban

Source: GAO analysis of Federal Highway Administration, U.S. Census Bureau, National Aeronautics and Space Administration, and U.S. Department of Agriculture data. | GAO-22-104578
“We are what we repeatedly do. Excellence, then, is not an act, but a habit.”

Aristotle