



# NBPP Local Agency Outreach for Bridge Preservation National Bridge Preservation Partnership Working Group



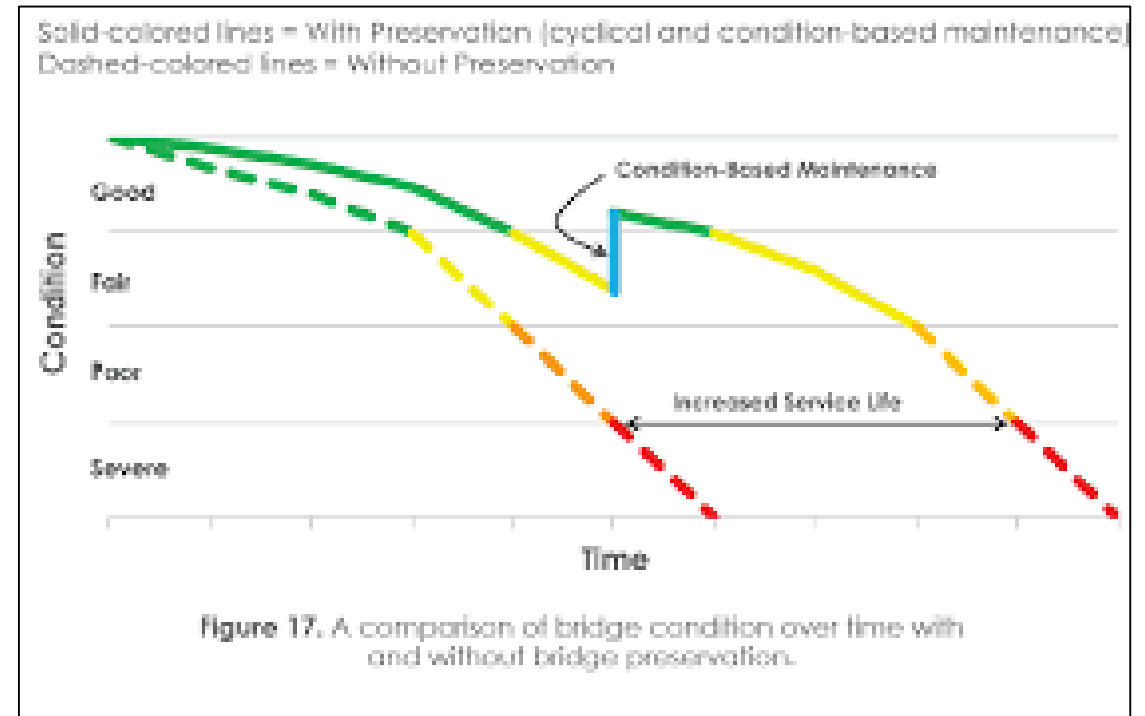
**2019 Northeast Bridge Preservation  
Partnership Meeting  
Bridge Preservation NOW!**

South Burlington, VT September 9 –11, 2019



# Bridge Preservation for Local Agencies – Training Module

- Better understand how bridge preservation is a crucial component of an asset management
- Bridge preservation activities that have demonstrated the best cost/benefit
- Demonstrate the BPETG pocket guides/phone app
- Coordinate with training offered by NCPP, NHI, AASHTO TC3



# NBPP Local Agency Outreach for Bridge Preservation-Scope

- Develop training modules for Local Agencies on Bridge Preservation
- Work with AASHTO in providing an avenue for Local Agencies to attend and participate in NBPP Regional Conferences



# Audience

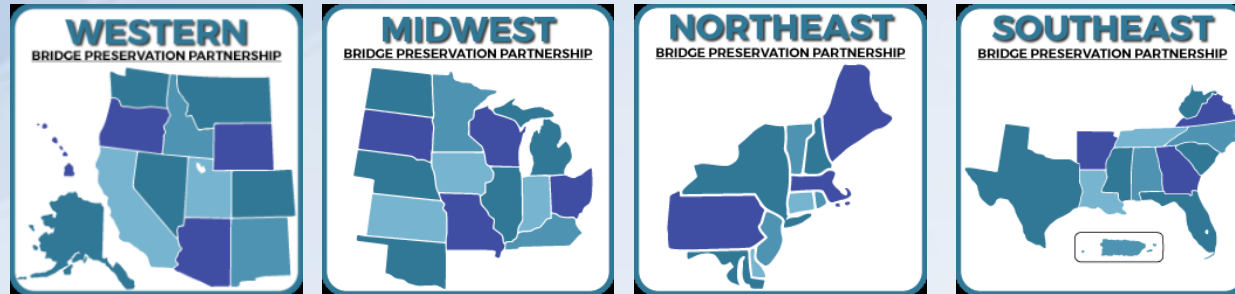
- Cities & County engineers, designers, maintenance crews, inspectors...
- State DOT officials
- State FHWA representative
- LTAP, NACE & other groups supporting bridge preservation



# Bridge Preservation Training – Part 1



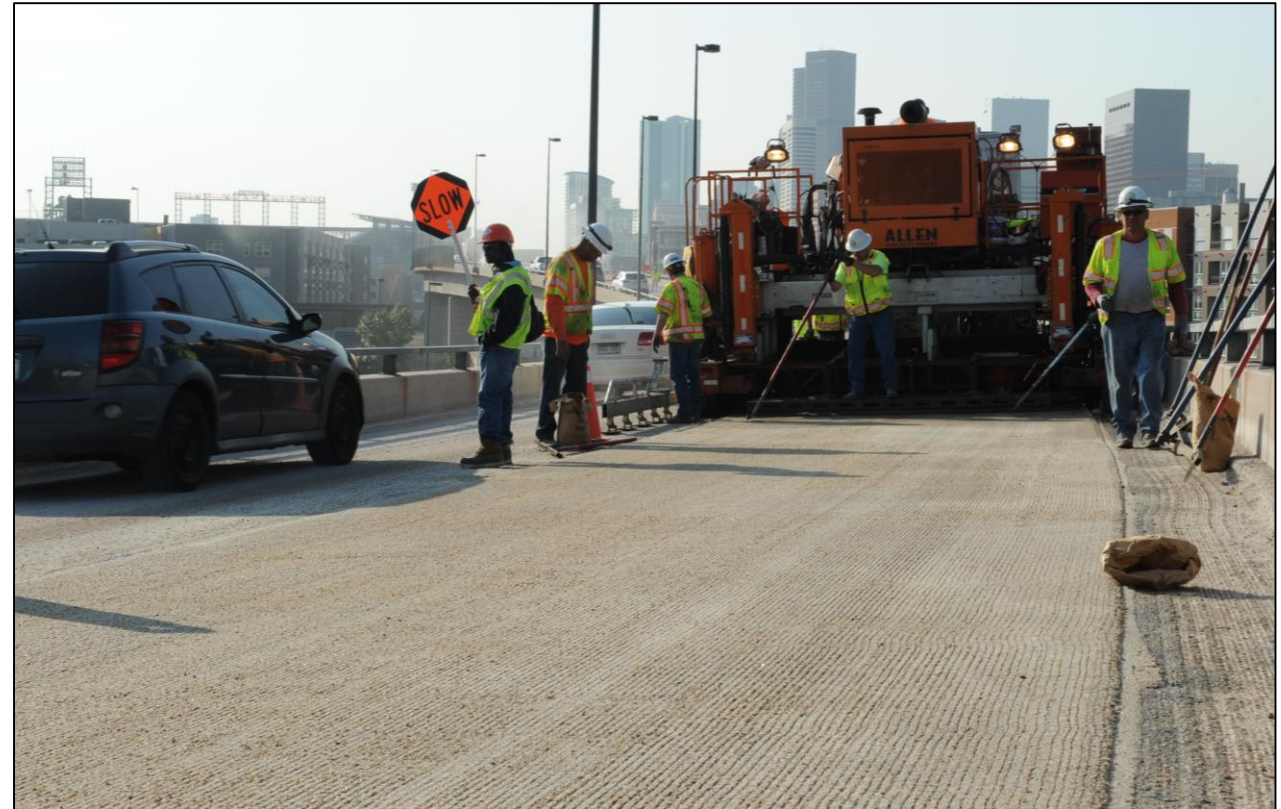
## Bridge Preservation for Local Agencies



National Bridge Preservation Partnership

# Part 1 – Overview

- What is TSP-2 and the NBPP
- Why focus on preservation?
- How to identify bridges for preservation?
- Developing and funding a bridge preservation project
- Preservation as part of an asset management plan
- Bridge Preservation Activity Review



# Bridge Preservation Activities Modules

- 2-3 slides for each bridge preservation activity to include:
  - Thin Polymer Overlay
  - Joint Systems
  - Bridge Cleaning & Washing
  - Bridge Maintenance Painting
  - Patching
  - Penetrating Sealers
  - Crack Sealers
  - Waterproofing Membrane



# Bridge Preservation Activities Modules

## Modules should discuss:

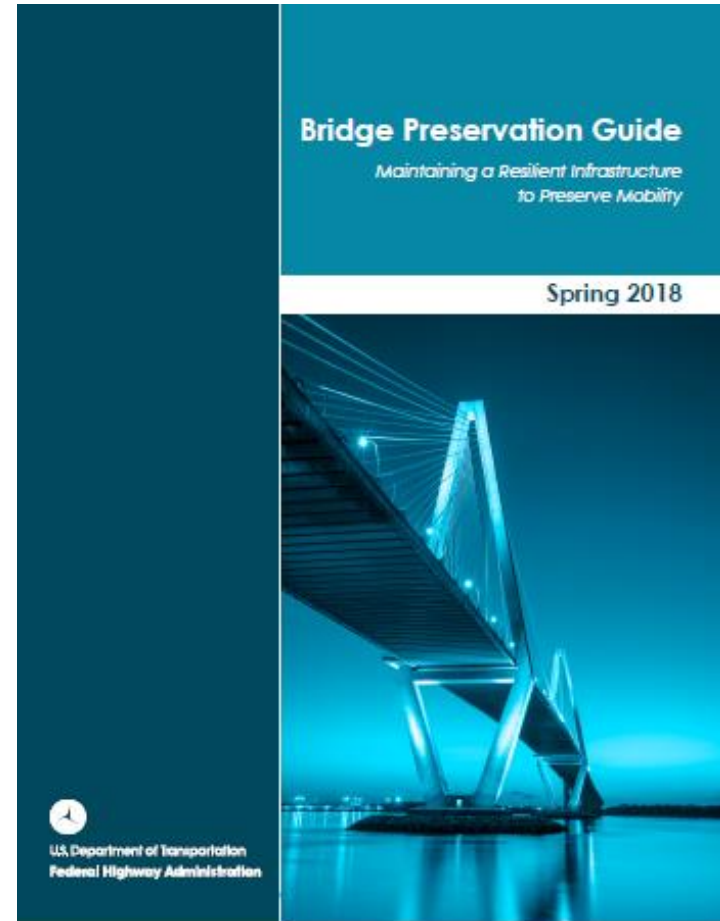
- When do perform each activity?
- Can this activity be performed in-house?
- Idea of cost to perform activity

## Further preservation activity modules:

- Need volunteers to develop
- Review FHWA BPG to determine further activities that are funded



How to support these efforts??





# FHWA BPG – Preservation Activities (Examples)

Table 2. Examples of cyclical maintenance activities.

Cyclical Maintenance Activity	Bridge Component
Clean/Wash Bridge	Deck and/or Super/Substructure
Clean and Flush Drains	Deck
Clean Joints	Deck
Deck/Parapet/Rail Sealing and Crack Sealing	Deck
Seal Concrete	Super/Substructure

Table 3: Examples of condition-based maintenance activities

Examples of Condition-Based Maintenance Activity	Bridge Component
Drains, Repair/Replace	Deck
Joint Seal Replacement	Deck
Joint Repair/Replace/Elimination	Deck
Electrochemical Extraction (ECE)/Cathodic Protection (CP)	Deck
Concrete Deck Repair (see halo effect below) in Conjunction with Overlays, CP Systems or ECE Treatment	Deck
Deck Overlays (thin polymer epoxy, asphalt with waterproof membrane, rigid overlays)	Deck
Repair/Replace Approach Slabs	Approach
Seal/Patch/Repair Superstructure Concrete	Superstructure
Protective Coat Concrete/Steel Elements	Superstructure
Spot/Zone/Full Painting Steel Elements	Superstructure
Steel Member Repair	Superstructure
Fatigue Crack Mitigation (pin-and-hanger replacement, retrofit fracture critical members)	Superstructure
Bearing Restoration (cleaning, lubrication, resetting, replacement)	Superstructure
Movable Bridge Machinery Cleaning/Lubrication/Repair	Superstructure
Patch/Repair Substructure Concrete	Substructure/Culvert
Protective Coat/Concrete/Steel Substructure	Substructure/Culvert
ECE/CP	Substructure/Culvert
Spot/Zone/Full Painting Steel Substructure	Substructure
Pile Preservation (jackets/wraps/CP)	Substructure
Channel Cleaning / Debris Removal	Channel
Scour Countermeasure (installation/repair)	Channel



Figure 7. Before bridge maintenance painting (left) and after (right).

# Thin Polymer Overlay System

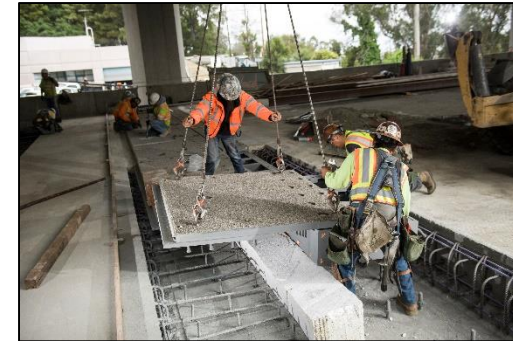
- Ultra low permeability to protect the deck concrete from the intrusion of moisture, de-icing chemicals and degradation
- Provide a protective, durable, skid-resistant wearing course for a concrete bridge deck



# Joint Systems – Repair & Replacement

## A bridge expansion joint is designed to:

- Provide a gap to accommodate longitudinal and transverse movements of a bridge superstructure. These movements are generally a result of live loads, thermal changes, creep and shrinkage, and the physical properties of the bridge materials.
- Protect the superstructure and substructure elements below the bridge deck from water runoff, adverse chemicals, and debris buildup.



# Bridge Cleaning & Washing

- Removal of chlorides and moisture trapping debris that can accelerate corrosion
- Keeps the bearing and joints free to move
- Promotes drainage with scuppers and inlet drains that function properly
- Provides bridge inspectors a better opportunity to spot deficiencies
- Extends the service life of coatings systems



# Bridge Maintenance Painting

- Bridge maintenance painting by removal and replacement is the most common method of using protective coatings to protect bridge steel from corrosion
- Painting provides a durable protective coating that usually contains color pigments to provide aesthetics as well as corrosion protection



# Patching

- Patching materials replace damaged concrete / restore concrete cover
- Considerations
  - Service Conditions
  - Causes of Deterioration
  - Methods of Testing
  - Application Conditions
  - Finish Requirements



# Penetrating Sealers

- Penetrating water repellents that mitigate moisture and chloride penetration in concrete
- Achieve a depth of penetration into the concrete that protects the treatment from surface abrasion and does not impact slip/skid resistance
- Do not treat visible cracks in concrete



# Bridge Deck Crack Sealing – Flood Coat Application

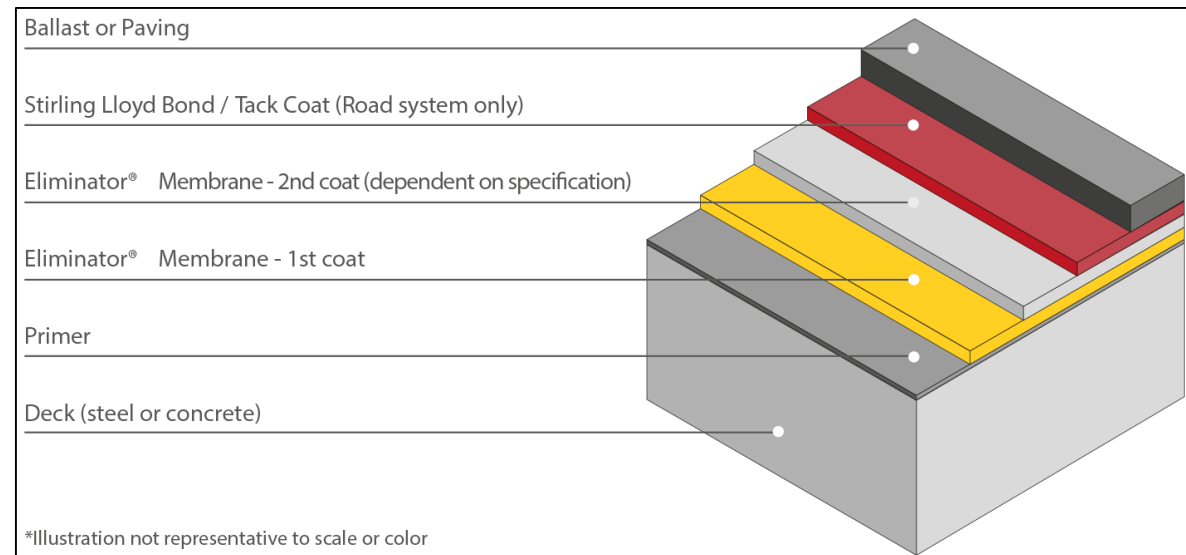
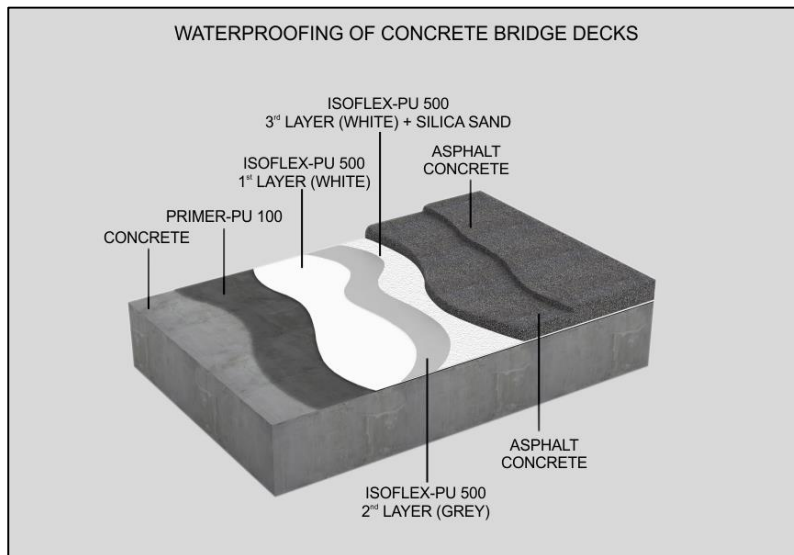
- Seals cracks in the bridge deck concrete to prevent the intrusion of moisture, de-icing chemicals and other damaging environmental affects
- Most effective when placed early, after initial shrinkage cracking and prior to exposure to de-icing chemicals





# Waterproofing Membrane

A waterproofing membrane is used on a concrete bridge deck to preserve the concrete deck underneath an asphalt overlay.



# FHWA BPETG – Local Agency Outreach Efforts

## Communication Plan – Local Agencies & Training

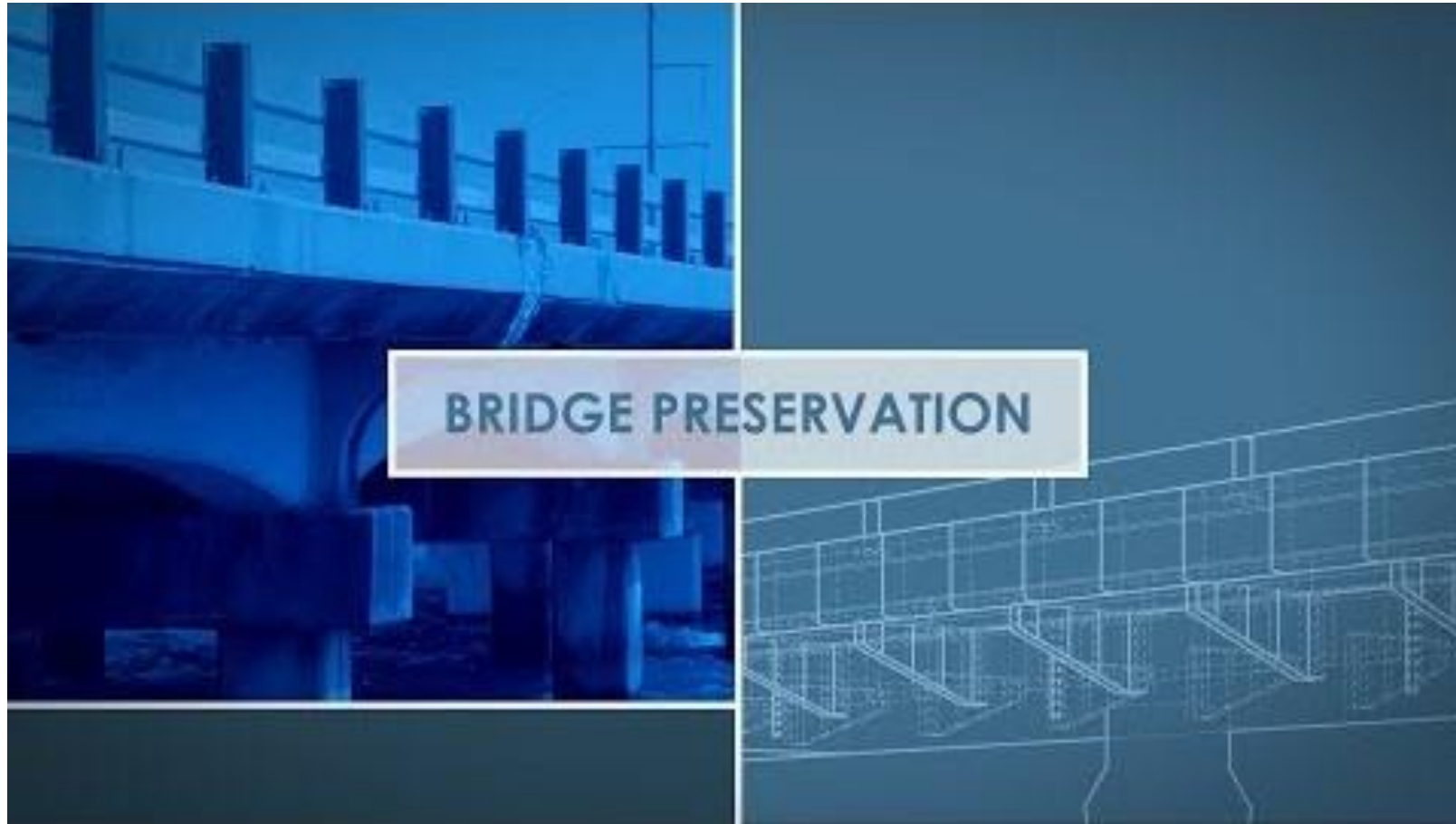
- Meetings, conferences and periodicals are important communication channels.
- There is also a time and need for instructor led technical training. The training arm of the FHWA is the National Highway Institute (NHI). As such, NHI has developed training specific to bridge preservation and maintenance.
- The BPETG will explore the possibility of adapting portions of the training specifically for use by local agencies and locally delivered training.

Also reference the FHWA Bridge Preservation Guide, Pocket Guides & Newsletter

<https://tsp2bridge.pavementpreservation.org/technical/fhwa/bp-etg-fhwa/>

<https://tsp2bridge.pavementpreservation.org/Bridge-Preservation-News-2/>

# FHWA Bridge Preservation Video



# FHWA BPETG – Pocket Guides/Phone Apps

## Pocket Guides Categories

- Thin Polymer Overlay Systems
- Bridge Cleaning
- Bridge Joint Systems
- Removal & Replacement of Bridge Coatings



# FHWA BPETG – Pocket Guides/Phone Apps

## Future Pocket Guides

- Spot, Zone & Overcoating – Draft is complete and undergoing internal review
- Bridge Deck Patching - Outline comments received. Draft being developed
- Substructure Preservation – Outline developed
- Latex Modified Concrete Overlay – Topic under discussion



Figure 5. Deck showing halo effect.

# AASHTO TC3 – Transportation Curriculum Coordination Council Training Support – FHWA BPG/Pocket Guides

- FHWA Bridge Preservation Guide (2 Modules) – has been published to the AASHTO TC3 training site and available to all
- Thin-Polymer Overlays- Complete
- Bridge Cleaning – Complete
- Bridge Coatings – Complete



<https://store.transportation.org/>



**ncpp**

# NATIONAL CENTER FOR PAVEMENT PRESERVATION

MICHIGAN STATE UNIVERSITY | ENGINEERING EDUCATION RESEARCH & OUTREACH



## BRIDGE PRESERVATION TRAINING FOR LOCAL AGENCIES

**TSP-2** Transportation System Preservation Technical Services Program  
**AASHTO** THE VOICE OF TRANSPORTATION  
**Bridge Preservation Blog**  
*"A Conversation About Bridge Preservation"*

**REGIONAL / NATIONAL WORKING GROUPS**

**TECHNICAL EXCHANGE**

**RESEARCH ROADMAP DATABASE**

**TSP2** TRANSPORTATION SYSTEM PRESERVATION TECHNICAL SERVICES PROGRAM  
**AASHTO** **BRIDGE PRESERVATION**

# Any Questions?



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