



# GPI - National Leaders in Bridge Preservation

Presented to: ASHE Altoona / PennDOT District 9-0 Annual Joint Workshop

Date: April 27, 2023



Engineering | Design | Planning | Construction Management



# Agenda

- **Introduction**
- **What is Bridge Preservation**
- **GPI & Bridge Preservation**
  - Pocket Guides / Smart Phone Apps
- **GPI's recent PennDOT Experience in Preservation**

# Introduction



## **Darin Hettich, PE, CBSI**

Project Manager / Western PA Client Manager

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### **Fun Fact:**

Darin grew up in the #1 milk-producing county in PA!



# What is Bridge Preservation

## Definition: Bridge Preservation

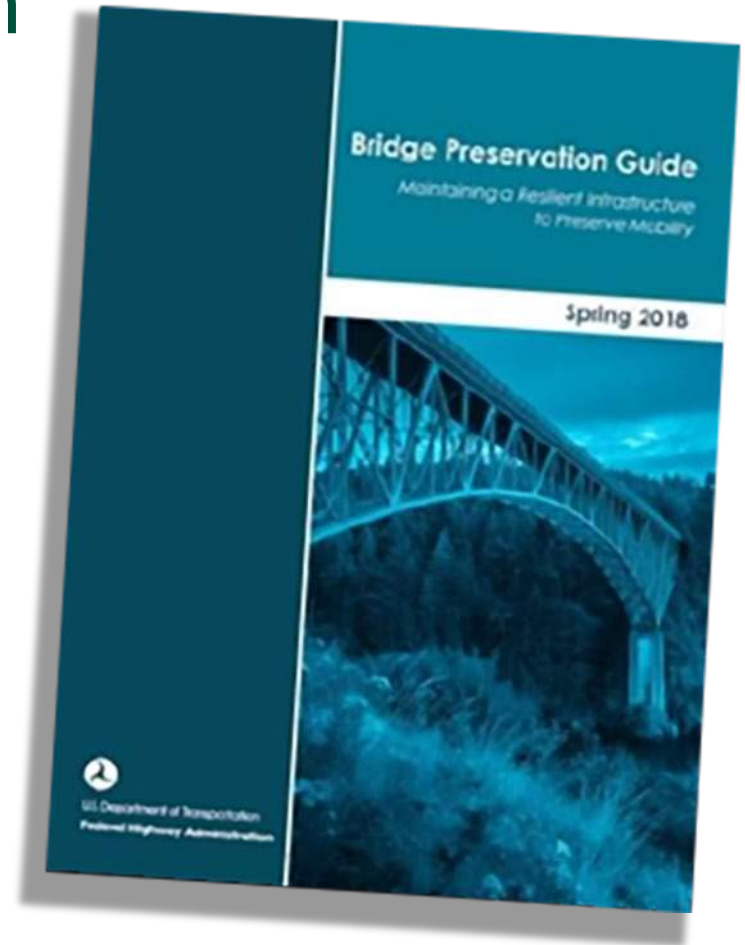
is defined as:

Actions or strategies that prevent, delay, or reduce deterioration of bridges or bridge elements; restore the function of existing bridges, keep bridges in good condition and extend their life.

Ref:

***FHWA Bridge  
Preservation Guide  
2018***

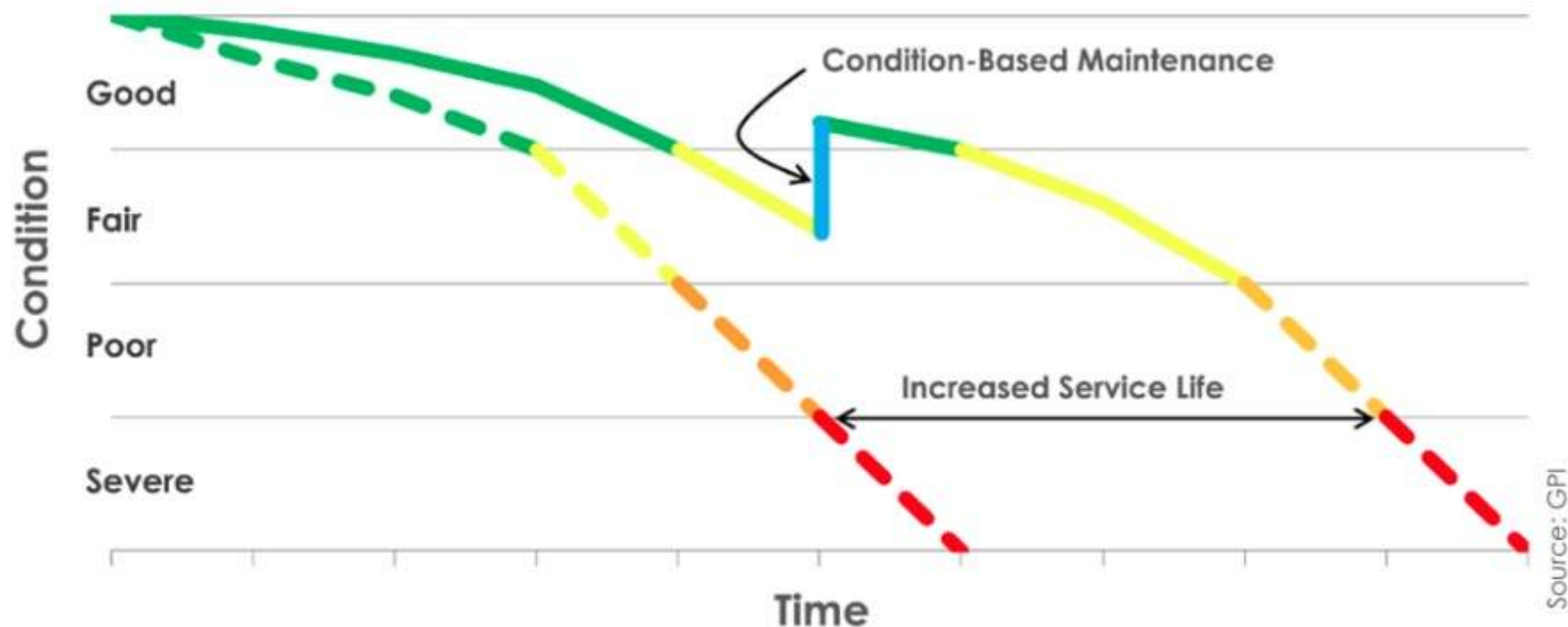
*Authored by GPI* 😊



[FHWA Bridge Preservation Guide](#)

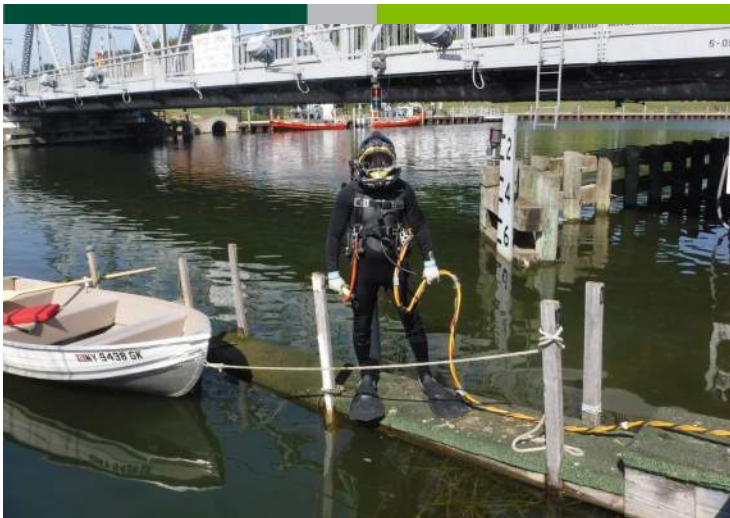
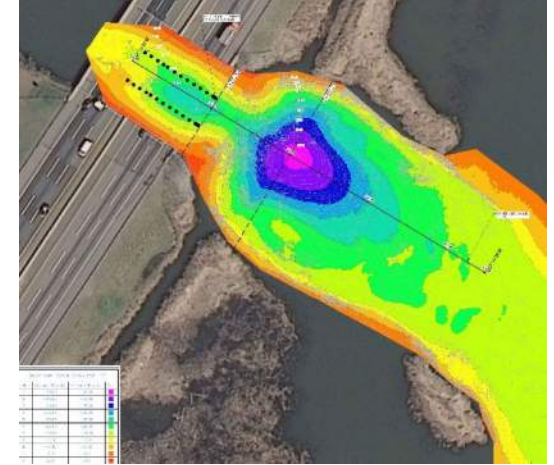
# Preservation

Solid-colored lines = With Preservation (cyclical and condition-based maintenance)  
Dashed-colored lines = Without Preservation



**Figure 17.** A comparison of bridge condition over time with and without bridge preservation.

# Condition Assessment - *Bridge Inspection*



- **Routine Bridge Inspection PLUS...**
  - Above Water, Below Water, Climbing, Drones, Underwater Imaging , LiDAR, Hands-On, Point Clouds



# Plan Implementation - *Elements*

- **Assessments include:**
  - Decks, Bearings, Joints, Substructures, Coatings



# Condition Assessment - *Bridge Coatings*

- Hands on assessments
- Samples
- Adhesion
- Thickness
- Locations on structure –  
Different locations may  
need different repairs
  - Spot, Zone, Overcoating, Full  
Replacement
- Surface Prep
- Typical Equipment needed
- Traffic Control





# TSP2

## TRANSPORTATION SYSTEM PRESERVATION TECHNICAL SERVICES PROGRAM

# AASH|O

# BRIDGE PRESERVATION

[Home](#) [Technical](#) [Bridge Special Provisions](#) [Research](#) [Legislative](#) [Training](#) [Library](#) [Industry](#) [Bridge News](#) [Site Map](#)

## Pocket Guides

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[POCKET GUIDE A User's Guide to Latex Modified Concrete Bridge Deck Overlays](#)

[POCKET GUIDE A User's Guide to Low Slump Concrete Bridge Deck Overlays](#)

[POCKET GUIDE A User's Guide to Supplemental Cementitious Material Concrete Bridge Deck Overlays](#)

[POCKET GUIDE A User's Guide to Ultra-High Performance Concrete Bridge Deck Overlays](#)

[POCKET GUIDE A User's Guide to Maintenance and Repair of Bridge Bearings](#)

[POCKET GUIDE A User's Guide to Removal and Replacement of Bridge Coatings](#)

[POCKET GUIDE A User's Guide to Bridge Cleaning](#)

[POCKET GUIDE A User's Guide to Thin-Polymer Bridge Deck Overlay System](#)

[POCKET GUIDE A User's Guide to Concrete Bridge Deck Patching](#)

[POCKET GUIDE A User's Guide to Spot, Zone, and Overcoating Existing Bridge Coatings](#)

[POCKET GUIDE A User's Guide to Repair of Bridge Concrete Substructure Elements](#)

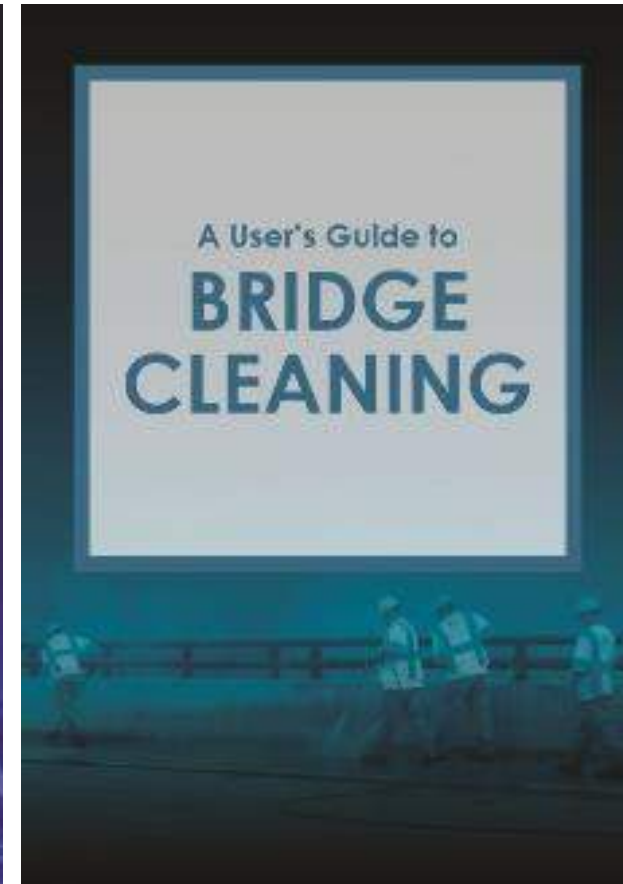
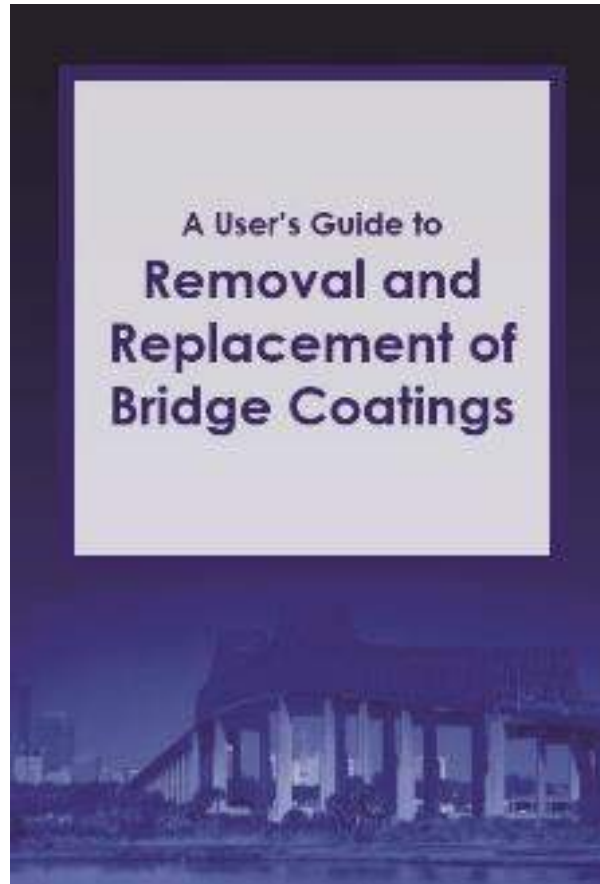
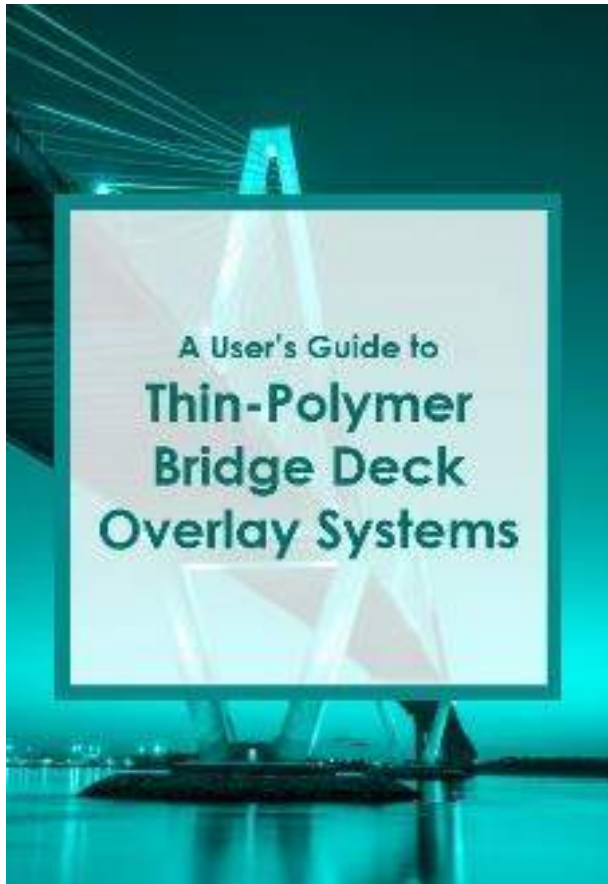
**TSP2  
HOMEPAGE**



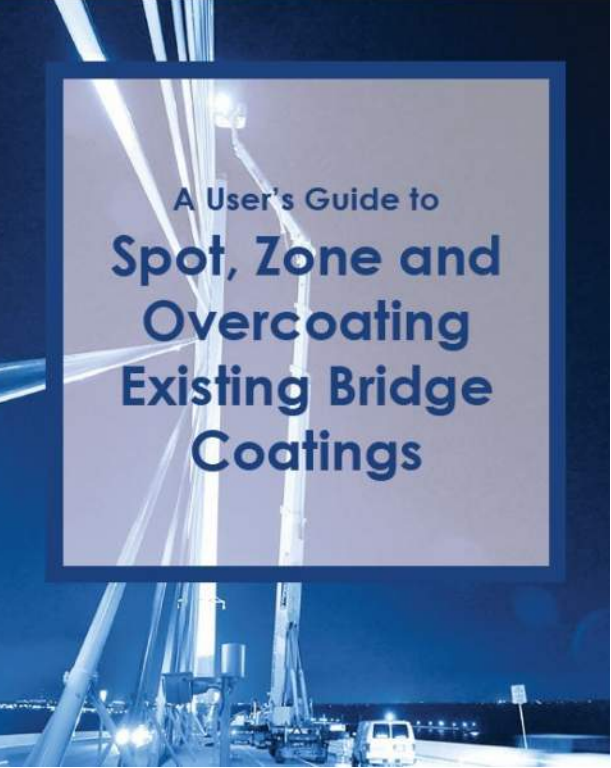
**Partnership Meetings**

2022 NEBPP 6/15-6/17

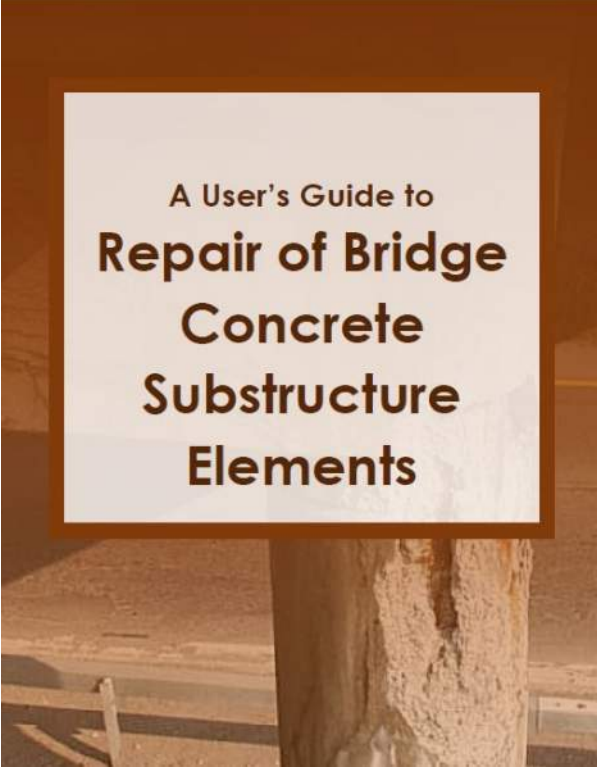
# Developed Pocket Guides



# Developed Pocket Guides



A User's Guide to  
**Spot, Zone and  
Overcoating  
Existing Bridge  
Coatings**



A User's Guide to  
**Repair of Bridge  
Concrete  
Substructure  
Elements**



A User's Guide to  
**Concrete Bridge  
Deck Patching**

Source: AASHTO TSP2

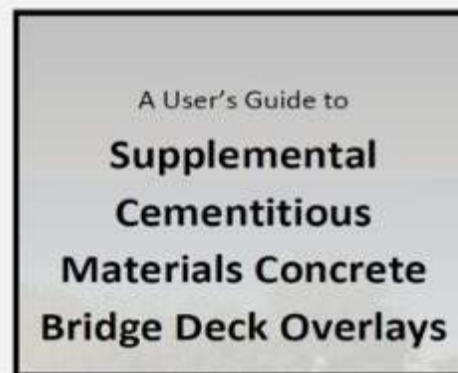
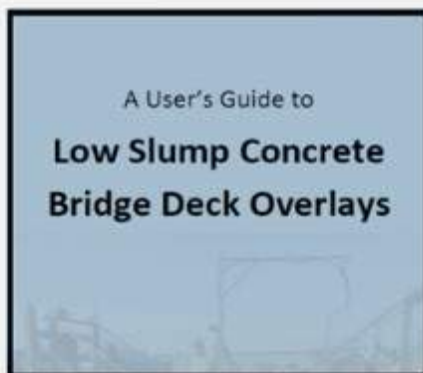
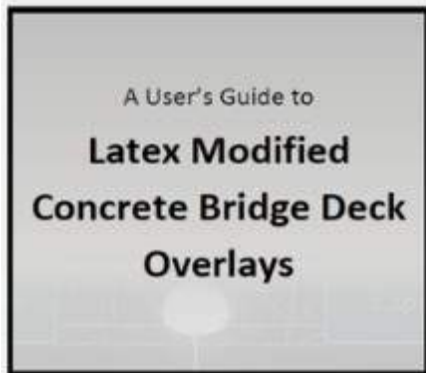
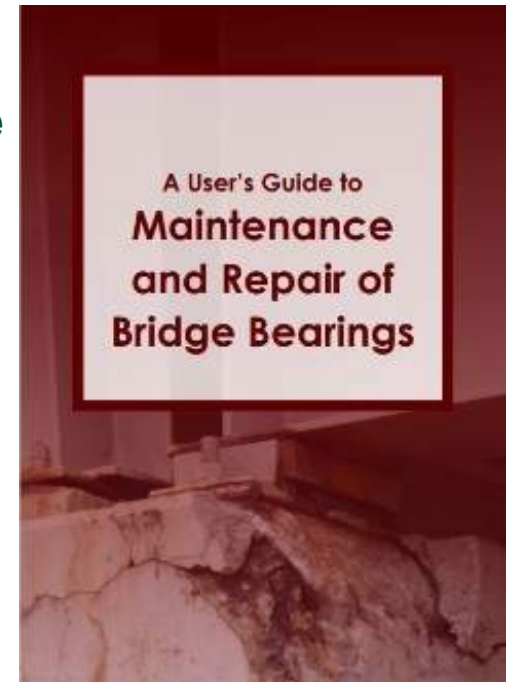


# Developed Pocket Guides

PDF Pocket Guides: PDF is Available; but no App to Date



Figure 6 - Bearing Prior to Cleaning and Painting. Source MaineDOT.



# FHWA Case Studies

- Eliminating Bridge Joints with Link Slabs
- Utilization of Cathodic Protection to Extend Service Life of Bridges
- Response to Bridge Impacts

Source: FHWA

## Case Study:

Response to Bridge Impacts – An Overview of State Practices

FHWA-HIF-20-087



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FEDERAL HIGHWAY ADMINISTRATION  
Office of Bridges and Structures  
1200 New Jersey Avenue, SE  
Washington, DC 20590  
September 2020

## Case Study:

Utilization of Cathodic Protection to Extend the Service Life of Reinforced Concrete Bridges – An Overview of the Installation and Maintenance of the Cathodic Protection Systems Protecting the Howard Frankland and Crescent Beach Bridges

FHWA-HIF-22-004



Source: GPI

Crescent Beach Bridge with Control Tower



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Washington, DC 20590  
November 2021

## Case Study:

Eliminating Bridge Joints with Link Slabs – An Overview of State Practices

FHWA-HIF-20-062



Source: MDTA

Eliminating a bridge joint prior to installation of link slab, Winch Ed over I-95, MD



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# GPI PA Preservation Applications - District 4-0

- **E04128 - Priority 1 Repairs Open End**
  - 11 Separate sites
    - *Rolled/built-up Steel, P/S Adj. Box Beams, Box Culverts, Conc Slab, etc.*
    - *12 ft to 173 ft total span lengths*
  - Preservation Strategies:
    - *Replace bearings/joint replacements/barrier transition retrofit*
    - *Heat straightening/zone painting/steel repairs*
    - *Weep hole retrofit/concrete repairs/soil nails*
    - *“Composite” PPC Overlay*



# GPI PA Preservation Applications - District 4-0

- **E04128 – Heat Straightening**
  - I-81 over SR 492 and SR 106
    - *Built in 1961*
    - *Bridge Impact Damage*
  - In Depth Inspection
    - *Locations and extent of damage*
  - Bid Documents:
    - *Req'd proof of experience, testing, etc.*
    - *Included damaged bolt replacement*
  - Submittals:
    - *Heat Locations/jack location*
  - Short term lane closures
  - In and out in a single day each site



# GPI PA Preservation Applications - District 4-0

- **E04128 – Soil Nail Installation**

- SR 11 over NY RR Corp.

- *Built in 1955*
- *6 -month inspection freq.*

- Bid Documents:

- *Conceptual Design*
- *Spec*
  - Testing requirements
  - Soil parameters

- Submittals:

- *Final Calculations*
- *Working Drawings*

