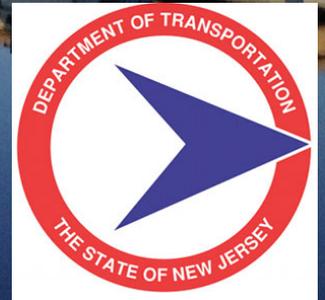


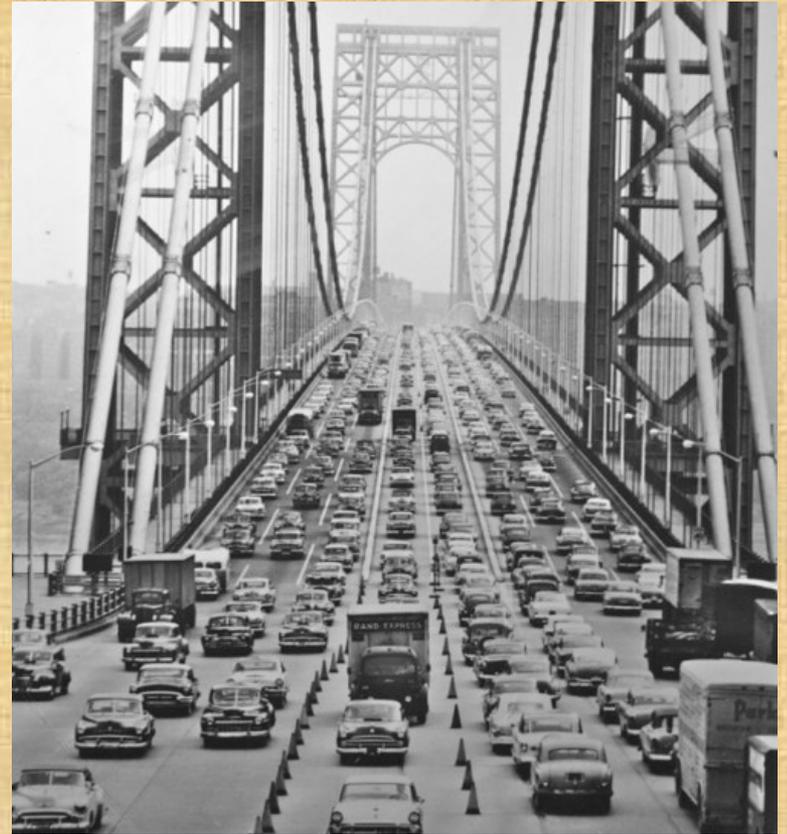
# NJDOT Federal Funding for Maintenance Contracts

Gerald P. Oliveto, P.E.



# New Jersey: Background & Demographics

- **Population: 8.8 Million (2012)**
- **Area: 7,300 Square Miles**
- **Population density: 1,205 inhabitants per square mile**
- **690 vehicles per 1,000 people (2007)**



# New Jersey: Background & Demographics

- 39,000 miles of public roadways
- 3,000 miles of State and US Highways
- 500 miles of Interstate Highways
- 6,542 Highway carrying bridges
- 2,545 State maintained highway carrying bridges
- 117 Orphan Bridges
- 17 Operational Drawbridges



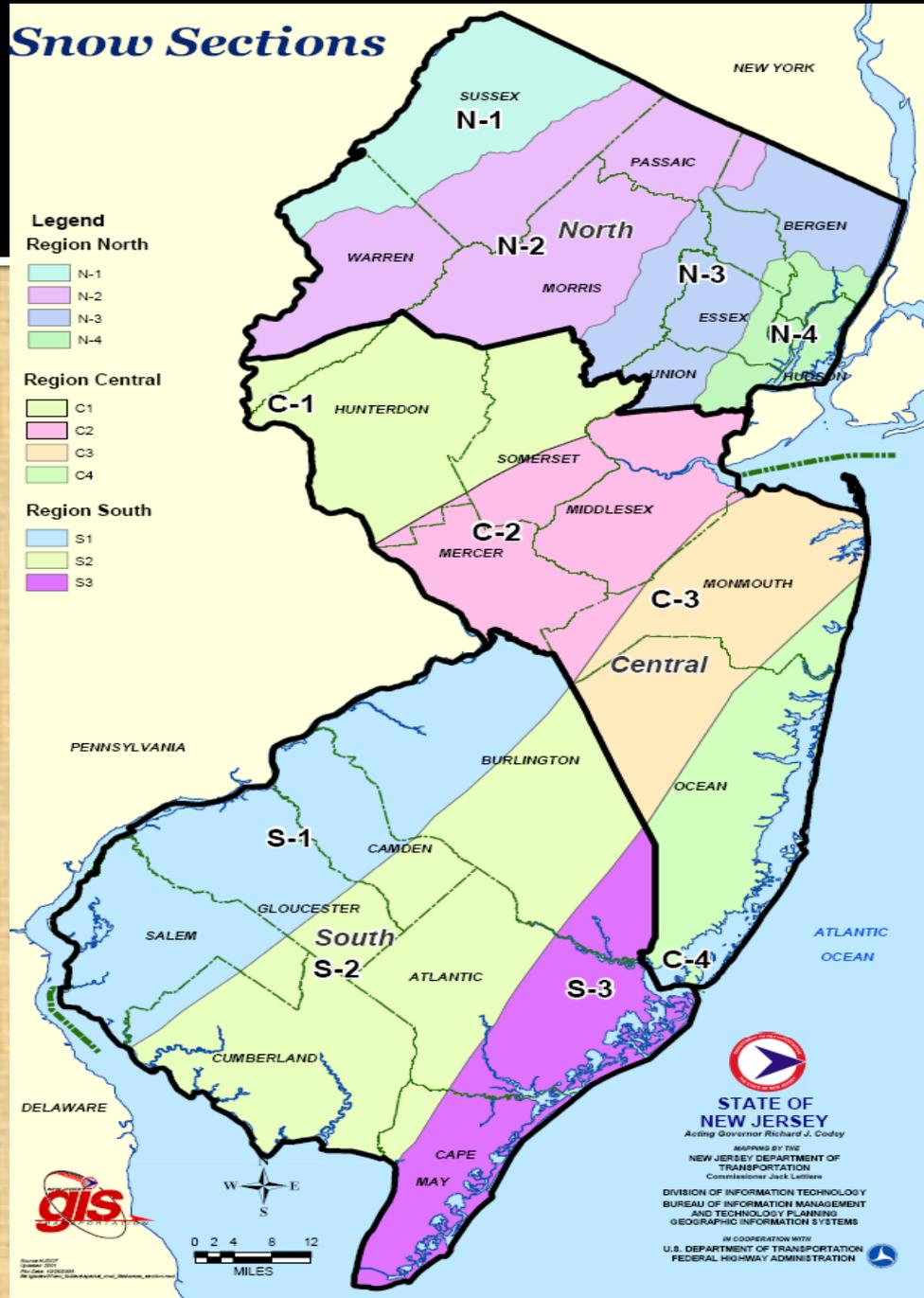
# **NJDOT Federal Funding for Maintenance Contracts**

- **NJDOT Bureau of Operations Support has several measures in place to preserve and extend the service life of bridges and roadways**
- **All NJDOT repair work is competitively bid and performed with outside contractors through annually issued contracts**

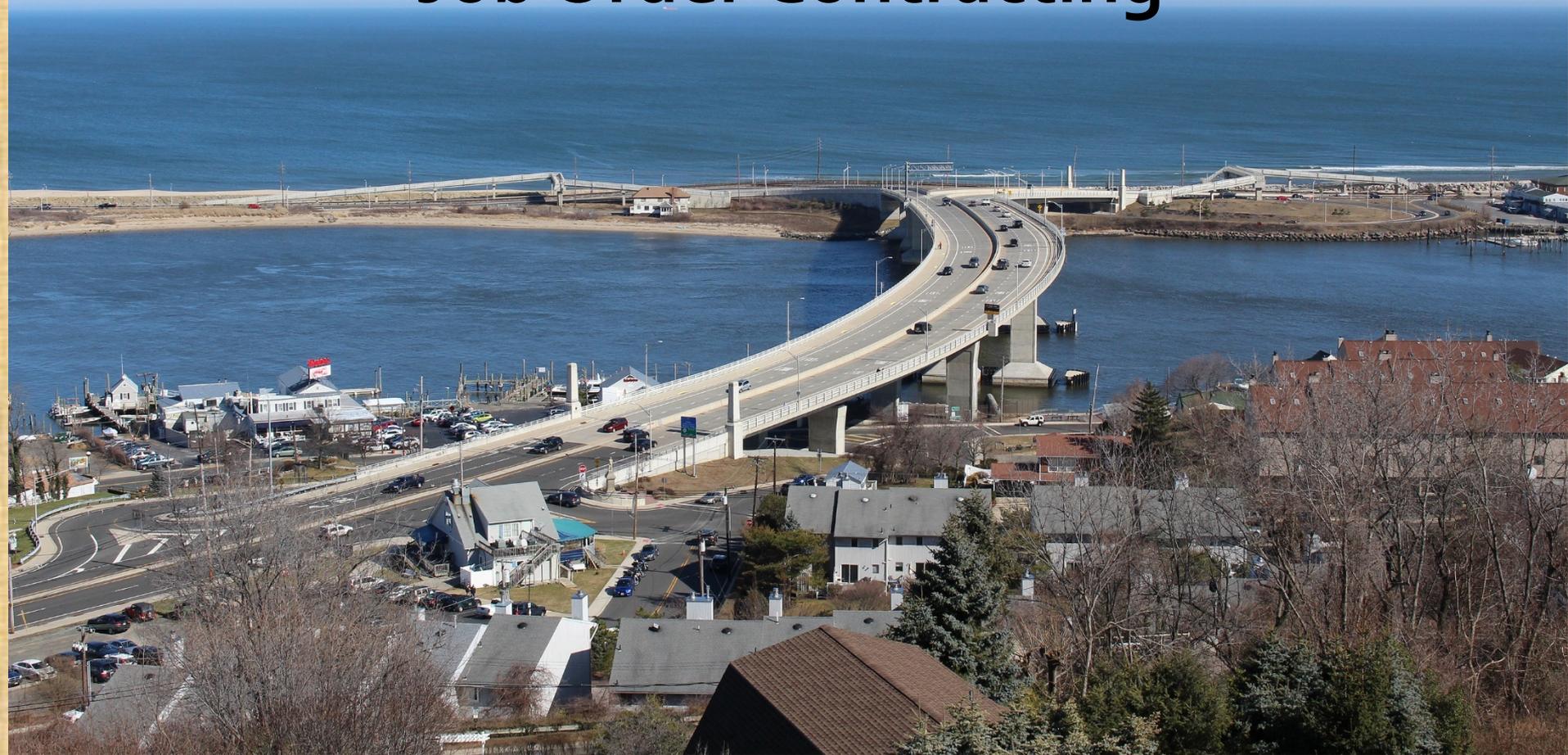
# **NJDOT Federal Funding for Maintenance Contracts**

- **NJDOT Bureau of Operations Support:**
  - **Bridge Maintenance**
  - **Drawbridge Maintenance**
  - **Roadway Maintenance**
  - **Drainage Maintenance**
  - **Electrical Maintenance**
  - **Specialty Projects**

# NJDOT Regions



# Bridge Preventive Maintenance Bridge Painting Job Order Contracting



# NJDOT Annual State Funded Bridge Contract Management

- **Five “If & Where Directed” bridge repair contracts**
  - **One contract each region: \$4 million each**
  - **One contract, orphan bridge repair: \$4 mil**
  - **One contract, statewide: \$10 million**
  - **One contract, Drawbridge Ops: \$10 million**
- **Total annual state bridge funds:  
\$36 million**

# **NJDOT Annual Federally Funded Bridge Contract Management**

- **Five Preventive Maintenance Contracts**
  - Three corridor-specific contracts, \$5 million ea.
  - One orphan bridge contract, \$5 million
  - One drawbridge contract, \$5 million
- **Four Bridge Painting Contracts**
  - All corridor-specific, \$7 million each
- **Two Job Order Contracts**
  - If & Where directed, \$ 5 million each
- **Total annual federal bridge funds:  
\$63 million**

# **FHWA 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.**

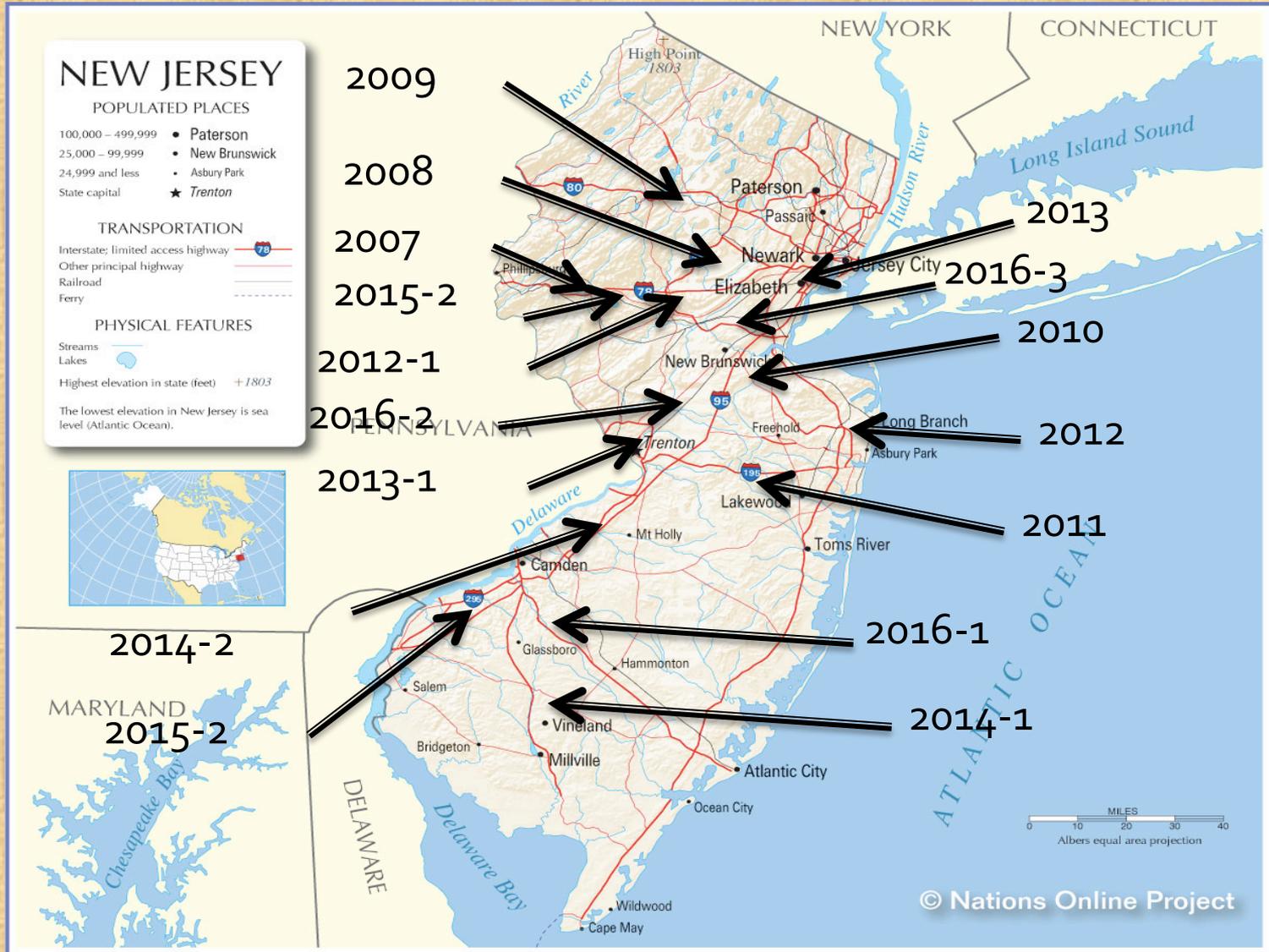
**Preservation actions may be preventive or condition-driven.**

# Bridge Preventive Maintenance Program

- Repairs bridges with National Bridge Inventory Deck, Superstructure, and Substructure Ratings of “5” or higher on a scale of “0” to “9”
- Created in 2007 using State funds, expanded in 2009 to be Federally funded

# Bridge Preventive Maintenance Program

- **Four corridor-specific Bridge Preventive Maintenance Contracts (BPMC) are put out to bid each year**
- **Each contract repairs roughly forty bridges along a single corridor or geographical area**



# NJDOT Bridge Preventive Maintenance Contracts

# Preventive Maintenance – Scope of Work

- **Comprehensive scope of work allows for many repairs to be made to keep bridges in good standing**
- **All structures on a contract are treated equally from top to bottom**
- **Scope of allowable work outlined in a joint NJDOT/FHWA Guideline document**

# Preventive Maintenance Header Repair

**BEFORE**



**AFTER**



**NJ Route 33 Westbound over US Route 9 Southbound; BPMC 2012**

# Preventive Maintenance Curb Repair

**BEFORE**



**AFTER**



**NJ Route 79 over NJ Route 18; BPMC 2010**

# Preventive Maintenance Deck Repair

**BEFORE**



**AFTER**



**Dunns Mill Road over Interstate 295; BPMC 2014-2**

# Preventive Maintenance Joint Re-Seal

**BEFORE**



**AFTER**



**Old York Road over Interstate 295; BPMC 2014-2**

# Preventive Maintenance Sidewalk Installation

**BEFORE**



**AFTER**



**Gordon's Corner Road over NJ Route 18; BPMC 2010**

# Preventive Maintenance Deck Crack Sealing



# Preventive Maintenance Deck Corrosion Inhibitor

## APPLICATION PHOTOS



**Brighton Avenue over NJ Route 18; BPMC 2010**

# Preventive Maintenance Approach Slab Repairs

**BEFORE**



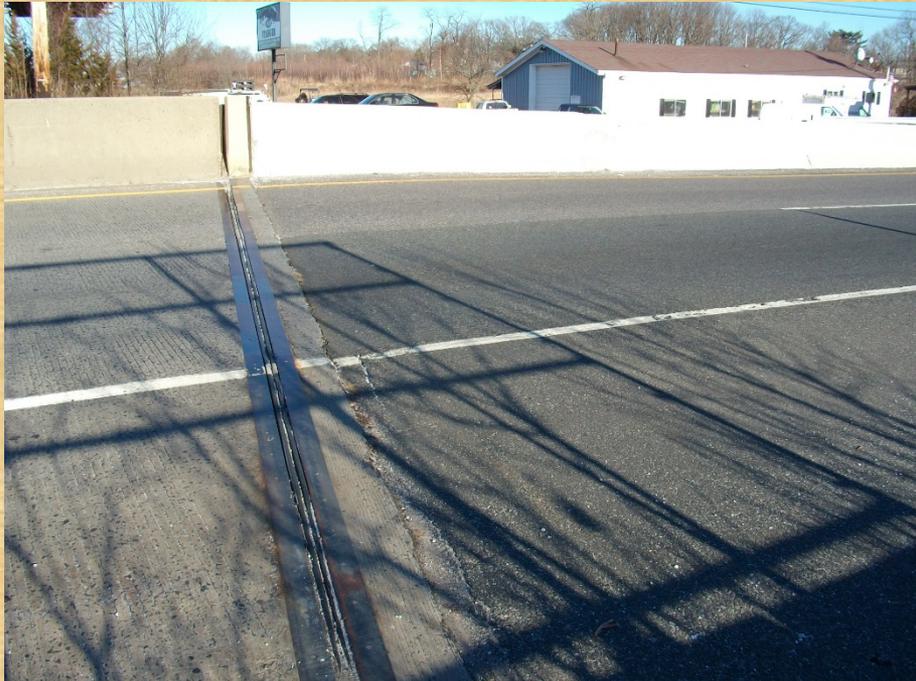
**AFTER**



**NJ Route 31 over Interstate 95; BPMC 2013-1**

# Preventive Maintenance Hot Mix Asphalt Patch

**BEFORE**



**AFTER**



**NJ Route 35 Southbound over Matawan Creek; BPMC 2012**

# Preventive Maintenance Fence Installation

**BEFORE**



**AFTER**



**NJ Route 34 Southbound over NJ Route 18; BPMC 2010**

# Preventive Maintenance Traffic Line Re-Striping

**BEFORE**



**AFTER**



**Klockner Road over Interstate 295; BPMC 2013-1**

# Preventive Maintenance Installation of Reflective Delineators

**BEFORE**



**AFTER**



**NJ Route 55 Northbound over Mays Landing Road; BPMC 2014-1**

# Preventive Maintenance Replacement of Structure ID Plates



# Preventive Maintenance Substructure Concrete Repair

**BEFORE**



**AFTER**



**Squankum Road under NJ Route 18; BPMC 2012**

# Preventive Maintenance Waterproofing Epoxy

**BEFORE**



**AFTER**



**Deal Road over NJ Route 18; BPMC 2010**

# Preventive Maintenance Substructure Crack Sealing



**Arena Drive under Interstate 295; BPMC 2013-1**

# Preventive Maintenance Lubrication of Bearings



# Preventive Maintenance Additional Actions

- Bridge deck sweeping
- Cleaning of scuppers and pipes
- Raised Pavement Marker replacement
- Repair of damaged bridge guide rail and guide rail bridge attachments
- Repair erosion, scour

# Preventive Maintenance – Cost

- Average cost per bridge for full preventive maintenance treatment:

**\$125,000**

# Preventive Maintenance Bridge Painting

- Allowable painting procedures include:
  - SSPC SP-3 Power Tool Cleaning; Beam Ends
  - SSPC SP-3 Power Tool Cleaning; Entire Bridge
  - SSPC SP-10 Near White Blast; Entire Bridge

# Preventive Maintenance

## Bridge Painting – Scope of Work

- Substructure concrete repair
- Structural steel repair
- Reset bearings
- Lubricate bearings
- Epoxy Waterproofing



# Bridge Painting - Cost

- Average cost per bridge for full bridge painting treatment:

**\$350,000**

# Preventive Maintenance Bridge Painting

- **Structure selection based on inspection reports from Structural Evaluation noting paint condition**
- **Painting contracts coordinated with Preventive Maintenance and Job Order Contracts to avoid duplicate work and fully treat structures**

# Preventive Maintenance Bridge Painting



Monmouth Road over NJ Route 18; BPMC 2010, BPC 2013-3

# Preventive Maintenance Bridge Painting



**Sylvania Ave over Memorial Dr, NJ Transit; BPMC 2012, BPC 2010-3**

# Bridge Painting SSPC SP-10 Near White Blast; Full Bridge

**BEFORE**



**AFTER**



**I-295 over Jacksonville Road**

# Bridge Painting SSPC SP-10 Near White Blast; Full Bridge

**BEFORE**



**AFTER**



**Thomas Street over Columbia Trail**

# Bridge Painting SSPC SP-3 Power Tool Cleaning; Full Bridge

**BEFORE**



**AFTER**



**Lower Ferry Road over I-95**

# Bridge Preventive Maintenance Program Job Order Contracting

- Job Order Contracts (JOC) utilize federal funds for “If & Where Directed” preventive maintenance repairs
- JOC follows modified FHWA approval process for construction
- Same allowable scope of work as Bridge Preventive Maintenance & Bridge Painting Contracts

# Bridge Preventive Maintenance Program Structure Selection

- Based on inspection reports from Structural Evaluation
- Inspection reports note deficiencies and generate “Work Orders” for maintenance repairs
- Clusters of Work Orders trigger selection of a corridor for repairs
- Outlying structures treated with JOC



- Personal
  - Application Login
  - Personal Programs

- Main Dashboard
  - Dashboard
  - Capital Program
  - Contracts
  - Work Orders
  - On-Line Help
  - WO Help Basic Editing
  - WO Help Selector

- Utilities
  - Forgot Password
  - New Account
  - General Procedures
  - User Guides
  - Calculator
  - Index Server
  - FAQ

## Operations - Capital Program Budget Manager Contracts

Dashboard **Work Orders**

### Welcome to the Operations Work Orders - Capital Program Manager - Work Orders - Manager Dashboard

Todays Work Order Date: 8/11/2015 1:35:01 PM Work Order User : Gerald Oliveto

[SHOW CHANGE INSTRUCTIONS](#)

Work Order Listing [Work Order Editing](#)

Select WO Type Then, The action to perform:

Select WO Type:  [GO](#)

Action:  [GO](#)

Current Time: Tue Aug 11 13:35:36 ET

#### Work Order Preview

Main Dash [Main Search](#) [Main Sort](#) [Fields Dash](#)

Search:  [GO](#) [Reset](#) [GO](#)

Quick Reports:

Saved Emails

Email To

[Send Work Order General Info](#)

[Send SE Priority Repair \(Notify\)](#)

ChkBoxes	Work View	Work Order	Work Order	Work Order	Structure	Date	Initiator	Project	Assigned	Work Order
ALL	Order	No	Description	No	No	Initiated		Manager	To	Status
<input type="checkbox"/>	<input checked="" type="radio"/>	BRIDGE	145	Heavy spalling along edges of deck and headers adjacent to deck joints at north and south abutments and all three (3) piers (Photos PR-1, PR-2, PR-3, PR-4 & PR-5 ). The deck joint membranes are debonded and distorted at spall locations with few areas of the membranes showing minor tears. Evidence of minor leakage stains were observed on the substructure elements (Photo PR-6).	1327163	10/19/2010	Amsnda DiPierro	Madeline Greene	George Franz	
<input type="checkbox"/>	<input checked="" type="radio"/>	BRIDGE	152		1322153	10/25/2010	Ahmad Ghorbani	Mike Moran		
<input type="checkbox"/>	<input checked="" type="radio"/>	BRIDGE	162		0723166	8/7/2011	Ahmad Ghorbani			
<input type="checkbox"/>	<input checked="" type="radio"/>	BRIDGE	168		0917158	9/14/2011	Ahmad Ghorbani			
Str. No. 1904-154, NJ Route 23 over Papakating Creek and Abandoned Conrail, Township of Wantage, Sussex County, NJ Route 23 M.P. 39.35 During our routine inspection we observed the following conditions we consider warranting priority action: 1. Severe erosion (4.0± wide x 5.0± long x 5.0± (max) deep)										

# NJDOT Work Order System

Operations - Capital Program - Work Orders

Select Work Order Type **Bridge**  Filter by WO Status **All WOs** Filter By

Quick Search Within Filter - WO Number or WO Description:

Current Filter: **Work\_Order\_Type = 'BRIDGE'** Current Search within Filter: **Work\_Order\_No = '8804'** WO Count: (1)



Structural Evaluation Priority Repairs: (BRIDGE)

Writer	Project Engineer	Supervisor Engineer	Group No
Meriam Michael	Robert Flanagan	Mujahid Khan	T15F

**Defects Description**

IH ENGINEERS were performing the routine field inspection of the subject bridge on June 10, 2015 and they observed the following defects: There is a heavy accumulation of loose concrete debris resting on the bridge seat of the center pier (Photos P1-01 and P1-02). Please note the center pier the pavement for the Southwest Boulevard roadway

**Recommendation Description**

We recommend that the following repairs be carried out on a Priority 1 basis: Remove the loose concrete debris from the pier bridge seat.

**Defects Email Contacts**

robert.flanagan@dot.nj.gov; timothy.lertch@dot.nj.gov; Meriam.Michael@dot.nj.gov; Mujahid.Khan@dot.nj.gov; denise.marshall@dot.nj.gov; greg.renman@dot.nj.gov; nat.kasbekar@dot.nj.gov

Notify	Date Notified
<input type="checkbox"/>	6/18/2015 2:46:00 PM

Operations Work Order

**General Work Order Information**

Date Initiated	WO Type	WO Number
6/18/2015	BRIDGE	8804

Initiator	Project Manager	Assigned To	Resident Engineer	Location Description
Denise Marshall	Anthony Ennas		Gerald Oliveto	0.4 MILES S OF NJ 47

Region	Routes	County Summary	Municipality Summary
SOUTH	NJ 55	Cumberland	Vineland City

**Email Contacts**  
Gerald.Oliveto@dot.nj.gov, Parth.Oza@dot.nj.gov

**Comments**

**Work Order Classification: (BRIDGE)**

Project Classification	WO Scope	Category Of Work	Priority	Lane Closure
Structural Evaluation	Remove	Loose Concrete Removal	P1	<input checked="" type="checkbox"/>

Structure No	Structure Name	Structure Type	Structure Route	Orphan
0609163	NJ 55 SB OVER SW BOULEVARD & CONRAIL	Steel - Stringer/Multi-beam or Girder	00055	<input type="checkbox"/>

**Work Order Progress Details**

Estimated Start Date	Estimated Completion Date	Estimated Cost	Estimated Crew Days	Overtime Authority No

Center Lane Miles	Lane Miles	Shoulder Miles	Ramp Miles

# Example Work Order

# Bridge Preventive Maintenance Program Work Orders

- Work Orders created by Structural Evaluation fall into three categories:
- Type E: Emergency Repair. Address deficiency immediately
- Type 1: Priority 1 Repair. Address deficiency within 30 days
- Type 2: Priority 2 Repair. Address deficiency within six months

# Bridge Preventive Maintenance Program Work Orders & FHWA Asset Management

- If structure has no associated work order, one is created upon completion of Preventive Maintenance work
- Manual entry of work performed on a structure creates a history of preservation actions
- Work Orders accessible internally to all NJDOT employees through website login, in both office and field

# Bridge Preventive Maintenance Program Work Orders & FHWA Asset Management

- Work Orders are closed out as repairs are made to a structure
- Closeout of Work Order sends necessary information back to Structural Evaluation for re-evaluation of super/sub structure and deck
- Type of repairs made, materials used, cost of repair, and completion photos all noted in Work Order closeout

# Bridge Painting Program

## Work Orders & FHWA Asset Management

- Upon completion of painting contract, Work Orders are created for each structure noting painting treatment applied
- Structural Evaluation notified of contract completion for re-evaluation of paint condition and updating of SI&A sheets

# Drawbridge Preventive Maintenance



# Drawbridge Preventive Maintenance

- **First contract introduced in 2015**
- **Joint effort between NJDOT and FHWA to amend NJDOT's Bridge Preventive Program to include drawbridge repairs**
- **Seventeen operational highway drawbridges under NJDOT jurisdiction**

# **Drawbridge Preventive Maintenance Scope of Work**

- **Cleaning & Lubrication of Drawbridge Lift Cables**
- **Cleaning & Lubrication of Drawbridge Sheave Assembly & Lift Cables**
- **Drawbridge Pest Control Brush Replacement**
- **Steel Surface Preparation & Spot Painting**

# Drawbridge Preventive Maintenance Scope of Work

- Service Warning Gongs
- Service Junction Boxes
- Service Warning & Barrier Gate  
Mechanical Equipment
- Lubricate Span Lock
- Service Span Lock  
Mechanical & Electrical  
Equipment



# Drawbridge Preventive Maintenance Scope of Work

- Service Machinery/Motor Brake  
Mechanical & Electrical Equipment
- Service Span Motor
- Service Control System Cabinetry
- Service Louver Assembly
- Service Power Distribution  
Transformers

# Drawbridge Preventive Maintenance



**Machine Room, NJ-88 over Lovelandtown Canal Vertical Lift**

# Drawbridge Preventive Maintenance



**Greased Cables, NJ-88 over Lovelandtown Canal Vertical Lift**

# Drawbridge Preventive Maintenance Cost

- Average annual cost per bridge for full drawbridge preventive maintenance treatment:

**\$275,000**

# Roadway Maintenance



# NJDOT Annual State Funded Roadway Contract Management

- **13 “If & Where Directed” roadway resurfacing contracts**
  - Four contracts each region: \$4 million each
  - One contract, statewide: \$10 million
- **3 “If & Where Directed” guiderail repair contracts**
  - One each region: \$4 million each
- **Total state roadway funds:  
\$70 million**

# **NJDOT Annual Federally Funded Roadway Contract Management**

- **Three Corridor-Specific Pavement Preservation Contracts**
  - One each region: \$5 million each
- **Three Corridor-Specific Long-Life Pavement Markings Contracts**
  - One each region: \$5 million each
- **Total annual federal roadway funds:  
\$30 million**

# **FHWA Pavement Preservation Definition**

**Pavement Preservation is a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety, and meet motorist expectations**

# Pavement Preservation Program

- Corridors selected based on Bureau of Pavement Management reports
- Selection criteria include:
  - Overall roadway condition
  - Rideability (IRI)
  - Roughness assessment
  - Skid friction testing
  - Rutting in wheel paths

# **Pavement Preservation Program**

## **Scope of Work**

- **Crack Sealing**
- **Concrete Joint Sealing**
- **Concrete partial/full depth repairs**
- **Concrete Diamond Grinding**
- **Slurry Seal**
- **Microsurfacing**
- **High Performance Thin Overlays**

# Pavement Preservation Program Intent

- Maintain a “fair” to “good” state of pavement
- Extend service life of pavement between 5-7 years
- Average age between preservation treatments: approx. 7 years

# Pavement Preservation Program



**Microsurfacing one lane width, NJ Route 55**

# Pavement Preservation Program



**Microsurfacing one lane width, NJ Route 55**

# Pavement Preservation Program



**Protection of RPM**

# Pavement Preservation - Cost

- Average cost per lane mile for full pavement preservation treatment:

**\$125,000**

# Long-Life Pavement Markings Contracts

## Scope of Work

- Continuous three-year cycle on selected highways
- Re-stripe all long-life epoxy traffic lines on corridor
- Remove & re-paint all long-life thermoplastic markings on corridor

# Drainage Maintenance



# NJDOT Annual State Funded Drainage Contract Management

- 3 “If & Where Directed” machine sweeping contracts
  - One contract each region: \$2 million each
- 3 “If & Where Directed” stormwater facilities maintenance contracts
  - One each region: \$2 million each
- 3 “If & Where Directed” timber & underwater repair contracts
  - One each region: \$3 million each
- Total state drainage funds:  
\$21 million

# NJDOT Annual Federally Funded Drainage Contract Management

- **Three site-specific drainage restoration contracts**
  - One each region: \$2 million each
- **Total annual federal drainage funds:  
\$6 million**

# Drainage Restoration Program

## Scope of Work

- Site-specific locations of drainage system on any state highway
- Video inspection of pipe
- Cleaning of pipes & culverts, regardless of size

# Specialty Projects



# **NJDOT Federally Funded Specialty Maintenance Projects**

- **Two projects currently in design**
- **Maintenance Bridge Fender Replacement Contracts**
  - **3 Contracts to replace 13 fender systems**
- **Maintenance Bridge Scour Countermeasures Contract**
  - **1 Contract to protect scour-critical structures**

# Specialty Maintenance Projects

## Bridge Fender Replacement

- \$4 million design
- Estimated \$50 million construction
- Full replacement of thirteen deteriorated fender systems
- New navigation lighting, tidal gauges, access walkways, catwalks, ladders
- Heavy coordination with environmental agencies

# Specialty Maintenance Projects

## Bridge Fender Replacement



**NJ-162 over Cape May Canal; Cape May, NJ**

# Specialty Maintenance Projects

## Bridge Fender Replacement



**NJ-109 over Cape May Canal; Cape May, NJ**

# Specialty Maintenance Projects

## Bridge Fender Replacement



**NJ-35 over Matawan Creek; Aberdeen, NJ**

# Specialty Maintenance Projects

## Bridge Scour Countermeasures

- \$4 million design
- Estimated \$20 million construction
- Installation of scour countermeasures on scour-critical structures
- Heavy coordination with environmental agencies

# Specialty Maintenance Projects

## Bridge Scour Countermeasures



**NJ-152 over Broad Thorofare; Longport, NJ**

# **NJDOT Federal Funding for Maintenance Contracts**

- **Continuous maintenance keeps the bridges of New Jersey in a state of good standing**
- **Close relationship between NJDOT and FHWA maximizes federal funding**
- **Coordination between maintenance programs greatly extends the service life of highways, waterways, & bridges**

Questions?



# NJDOT Federal Funding for Maintenance Contracts



**Thank you!**

**Gerald P. Oliveto, P.E.**

**Gerald.Oliveto@dot.nj.gov**