Bridge Preservation Course Series

- Course 1: Bridge Preservation Fundamentals (4 hours)
  - FHWA-NHI-130106A
- Course 2: Establishing a Bridge Preservation Program (5 hours)
  - FHWA-NHI-130106B
- Course 3: Communication Strategies for Bridge Preservation (3 hours)
  - FHWA-NHI-130106C
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Bridge Preservation Fundamentals

Definitions and Terminology

Lesson 1
What is bridge preservation?

Bridge preservation is the 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.

Source: American Association of State Highway and Transportation Officials (or AASHTO) Subcommittee on Maintenance
Bridge Preservation Components

- Bridge Preservation
  - Rehabilitation
  - Preventive Maintenance
    - Condition-Based Activities
    - Cyclical (Non-Condition-Based) Activities
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Bridge Preservation Fundamentals

Benefits of Timely Bridge Preservation and Consequences of Deferred Maintenance

Lesson 2
Keep Bridges in Good Condition and Extend Their Useful Life
Implement Timely Preservation Treatments

Preventive Maintenance Only

Major Repairs/Rehabilitation Only
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Bridge Preservation Fundamentals

Deck Preservation Practices and Activities

Lesson 3
Scheduled and Cyclical Deck Preventive Maintenance Activities

- Bridge cleaning and washing
- Deck joint maintenance
- Deck sealing and waterproofing
- Deck overlays
- Drainage system cleaning
Condition-Based Deck Preventive Maintenance Activities

- Deck surface repairs
- Crack sealing
- Installation of deck overlay
- Bridge rail maintenance or repairs
Common Cost Effective Rehabilitation Strategies for Concrete Decks

• Partial-Depth Deck Reconstruction

• Full Deck Replacement
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Bridge Preservation Fundamentals

Superstructure Preservation Practices and Activities

Lesson 4
Bridge Superstructure Material Types
What are commonly used, cost-effective, scheduled, or cyclical superstructure preventive maintenance activities?

- Cleaning and washing for both concrete and steel
- Sealing and waterproofing of concrete
- Painting of steel
- Lubrication of bearings
What are commonly used, cost-effective, condition-based superstructure preventive maintenance activities?

- Concrete crack repairs
  - Epoxy injection
  - Penetrating sealer
  - Dry packing

- Concrete surface repairs
  - Cast-in-place concrete or shotcrete

- Steel surface repairs
  - Overcoating
  - Complete recoating
What are commonly used cost-effective superstructure rehabilitation activities?

- Superstructure repairs
- Beam-end, diaphragm, and cross bracing repairs
- Concrete superstructure strengthening
- Retrofitting fatigue prone details
- Retrofitting fracture critical members
- Superstructure replacement
- Cathodic protection or electrochemical chloride extraction treatments with superstructure repairs
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Bridge Preservation Fundamentals

Substructure Preservation Practices and Activities

Lesson 5
Bridge Substructure Material Types
What are commonly used, cost-effective, scheduled, or cyclical substructure preventive maintenance activities?

- Cleaning and washing for concrete and steel
- Painting for steel
- Sealing and waterproofing for concrete
- Surface treatments and fumigants for timber
What are commonly used condition-based cost-effective substructure rehabilitation activities?

• Substructure repairs
• Spall repairs to bridge seats/pier caps
• Concrete or timber pile jacketing
• Steel or timber pile splicing
• Crack injection
• Substructure element replacement or reconstruction
• Cathodic protection or electrochemical chloride extraction treatments of substructure elements
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Bridge Preservation Fundamentals

Culvert Preservation Practices and Activities

Lesson 6
Establishing a Bridge Preservation Program

Goals, Objectives, and Performance Measures

Lesson 1
What are goals?

**Goals** are typically long-term aims of an organization and are more general and less structured than objectives.

What are objectives?

**Objectives** are short-term specific actions that must be taken to achieve desired outcomes and are specific and usually outlined into steps or actions that often include deadlines and budget limitations.

What are performance measures?

**Performance measures** are specific steps that can be evaluated and monitored for their completeness.
Establishing a Bridge Preservation Program

Needs Assessments and Data Management

Lesson 2
Lesson 2: Needs Assessments and Data Management

By the end of this lesson, you will be able to:

• Describe National Bridge Inventory (NBI) and element level condition assessment methods and identify influencing implementation factors

• Identify feasible and cost effective bridge preservation related activities and treatments, and classify these activities under appropriate funding programs

• State how bridge preservation needs are identified, prioritized, and programmed
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Establishing a Bridge Preservation Program

Budgeting and Resource Allocation

Lesson 3
Bridge Preservation Funding and Budget Allocation

State Funding  Federal Funding  Other Funding

Total Preservation Funding

Preventive Maintenance Budget
- Cyclical Activities Budget
  - Individual Cyclical Activities Budget
- Condition-Based Activities Budget
  - Individual Condition-Based Activities Budget

Rehabilitation Budget
- Deck Rehabilitation Budget
- Superstructure Rehabilitation Budget
- Culvert Rehabilitation Budget
- Substructure Rehabilitation Budget
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Establishing a Bridge Preservation Program

Work Plan Development and Implementation

Lesson 4
Work Plan Development

1. Evaluate Needs
2. Perform Analysis (Iterations)
3. Identify Work Candidates
4. Create Projects
5. Create Programs
Cyclical PM Work Item Selection Process

1. Apply Selection Criteria
2. Select Structures
   - Cyclical PM Cost effective?
     - yes
     - Select and Quantify Activities
     - Select or Postpone Candidates
     - Rank and Compare Candidates
   - no
     - Project
3. Approve?
Bridge Work Item Selection Process

1. **Select Structure**

2. **Evaluate Needs from Reports**

3. **Preventive Maintenance Cost effective?**
   - **yes**
     - **Select and Quantify Activities**
     - **Select or Postpone Candidates**
   - **no**
     - **Rank and Compare Candidates**

4. **Approve?**
   - **yes**
     - **Project**
   - **no**
     - **Return to Select Structure**
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Establishing a Bridge Preservation Program

Program Monitoring

Lesson 5
What is program monitoring?

- Evaluates effectiveness of all aspects of a program
- Requires a defined plan
- Measures gaps between the baseline and achievements
- Measures gaps between achievements and goals
- Provides information for adjustments in line with continuous improvement processes
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Communication Strategies for Bridge Preservation

Identifying Customers and Stakeholders

Lesson 1

*** A Great Resource is NCHRP Report 742

Communicating the Value of Preservation: A Playbook***
Identifying an Agency Champion for Bridge Preservation

- A leader who enables others to "live" the vision in their day-to-day activities
- A person who recognizes that there is a growing emphasis on preservation
- Someone ready to communicate the message and persuasively present the preservation case
Identifying and Segmenting Customers and Stakeholders

• What motivates them to action

• What words resonate with them

• Who their trusted sources of information are

• Which methods of communication are most effective for reaching them
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Communication Strategies for Bridge Preservation

Designing the Message

Lesson 2
Message Design Activities

1. Establish a sound foundation of facts

2. Target the right audience so message resonates

3. Coordinate with DOT’s other messages

4. Address specific situation:
   - Infrastructure Condition
   - Lack of Resources
   - Customer Values
   - Etc.
Message Design

• Both art and science

• Fierce competition for attention
  – Succinct and compelling
  – Communicate to thrive!

• Message design steps create custom messages

• Remember - No single message or group of messages will work for every agency or situation.
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Communication Strategies for Bridge Preservation

Communicating the Message

Lesson 3

Most Common Communication Delivery Methods

- Press releases: 96%
- Presentations to stakeholder: 84%
- Website (one-way): 72%
- One-on-one meetings: 68%
- Fact sheets: 68%
- Brochures: 64%
- Social networking sites: 60%
Identify Critical Activities in Message Delivery

1. Create foundation with internal message delivery strategy
2. Create or refine direct audience contact strategy
3. Create or refine traditional media strategy
4. Create or refine new media strategy
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Communication Strategies for Bridge Preservation

Performing Market Research

Lesson 4

Bridge Preservation Market Research

1. Are consumers satisfied with bridge conditions with your state?
   - Yes
   - No

2. Which of the following do you think consumers see as the greatest value of a strong bridge preservation program?
   - Fewer bridge restrictions
   - Overall cost savings
Methods DOTs Use to Track Stakeholder Opinions

- Website comments: 22
- News clip tracking: 20
- Public hearings or meetings: 20
- Satisfaction surveys: 12
- Focus groups: 8
- Opinion polling: 7
- Comment cards: 6
- Online communities: 4
- Road rallies: 4
- Don't know: 4
- Do not track opinions: 4
THANK YOU !!!!!
QUESTIONS????

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