

Bridge Preservation - Maintaining State of Good Repair Using Low Cost Investment Strategies



National Bridge Management, Inspection and Preservation Conference

November 1, 2011
St. Louis, MO

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Presentation Outline

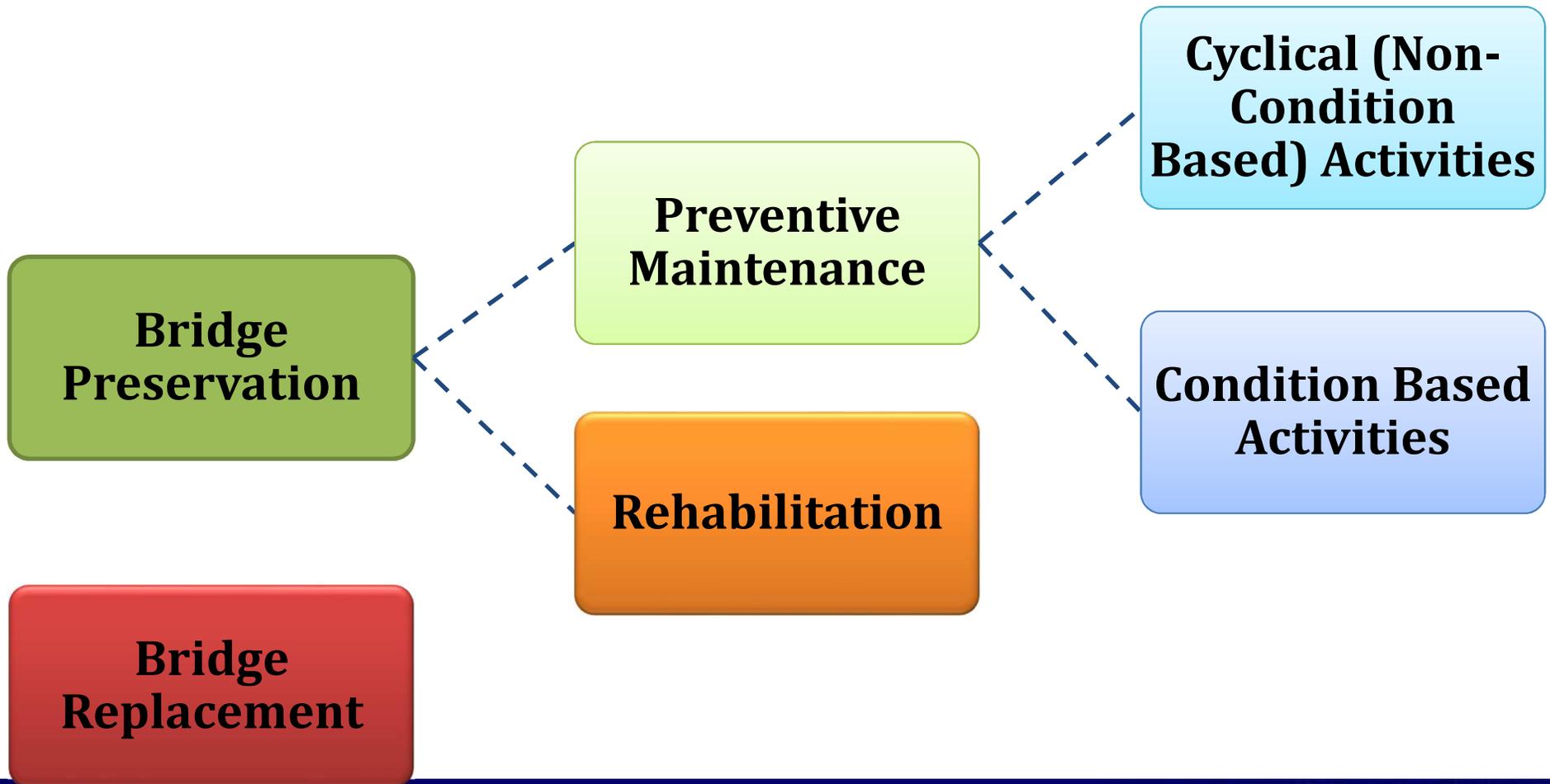
- Bridge Preservation Related Terminology
- Systematic Preventive Maintenance
- Bridge Preservation Examples



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Bridge Preservation Terminology



Bridge Preservation Definition

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 useful life. Preservation actions may be preventive or condition-driven.



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Preventive Maintenance

Preventive maintenance is a planned strategy of cost-effective treatments to an existing roadway system and its appurtenances that preserves the system, retards future deterioration, and maintains or improves the functional condition of the system (without substantially increasing structural capacity).

Source: AASHTO Subcommittee on Maintenance.

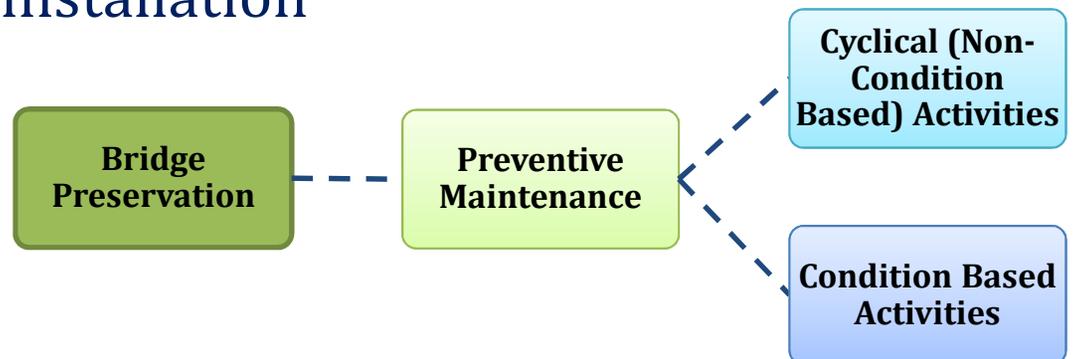


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Preventive Maintenance

- Preventive maintenance (PM) is considered a component of preservation
- PM includes cyclical and condition based activities
- Examples of condition based PM activities include:
 - Sealing or replacing leaking joints
 - Installation of deck overlays
 - Complete, spot, or zone painting of steel elements
 - Scour countermeasures installation
 - etc.



Preventive Maintenance

Cyclical PM Activity Examples	Commonly Used Frequencies
Wash/clean bridge decks or entire bridge	1 to 2 Years
Install deck overlay on concrete decks such as:	10 to 15 Years
- Thin bonded polymer system overlays	
- Asphalt overlays with waterproof membrane	
- Rigid overlays such as silica fume and latex modified	20 to 25 Years
Seal concrete decks with waterproofing penetrating sealant	3 to 5 Years
Zone coat steel beam/girder ends	10 to 15 Years
Lubricate bearing devices	2 to 4 Years
Coat timber elements with wood preserver sealant	1 to 2 Years



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Frequencies are based on FHWA's knowledge of typical state DOT Practices

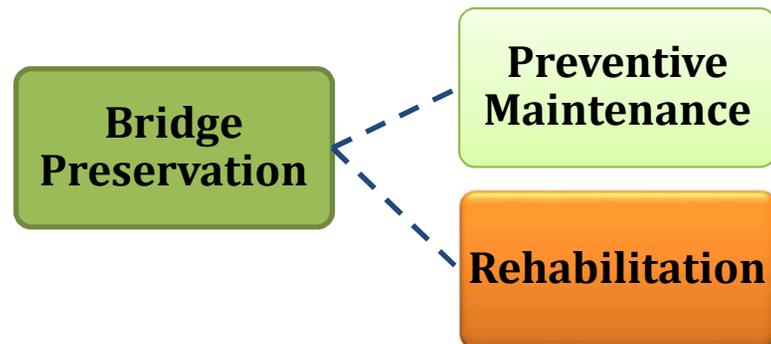


Rehabilitation

Rehabilitation involves major work required to restore the structural integrity of a bridge as well as work necessary to correct major safety defects.

Source: 23 CFR 650.403(c).

- Bridge rehabilitation activities are considered bridge preservation.
- Functional improvements such as adding a travel lane or raising vertical underclearance are not considered preservation.



Replacement

Total replacement of a structurally deficient or functionally obsolete bridge with a new facility constructed in the same general traffic corridor. the facility over its design life. *Source: 23 CFR 650.405(b)(1).*

- Bridge replacement is not considered a preservation activity.

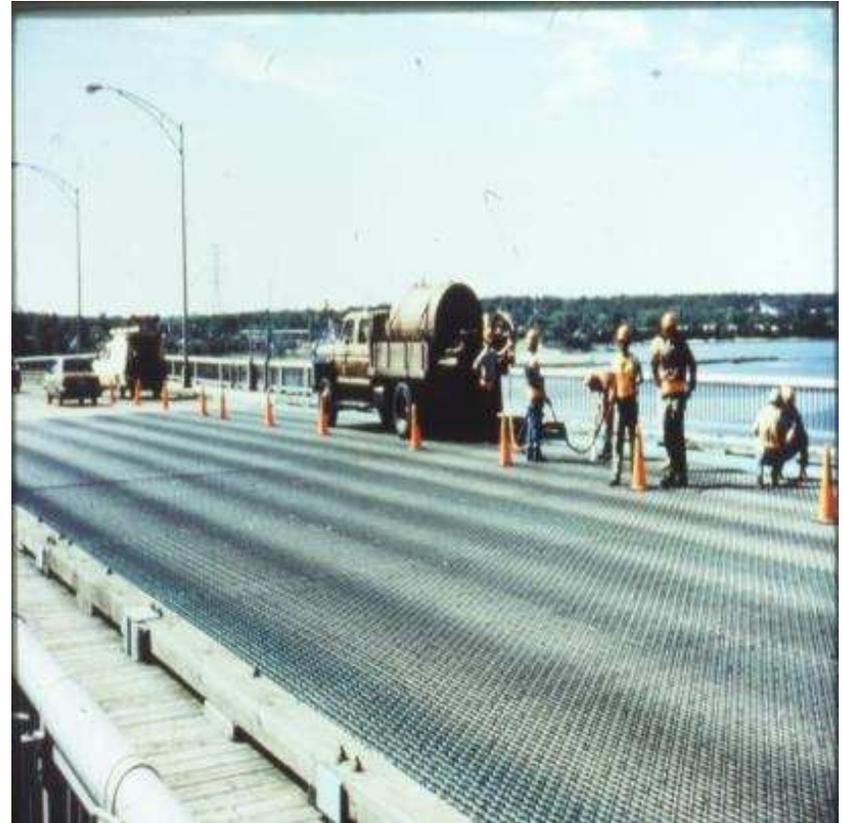


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Benefits of Preventive Maintenance

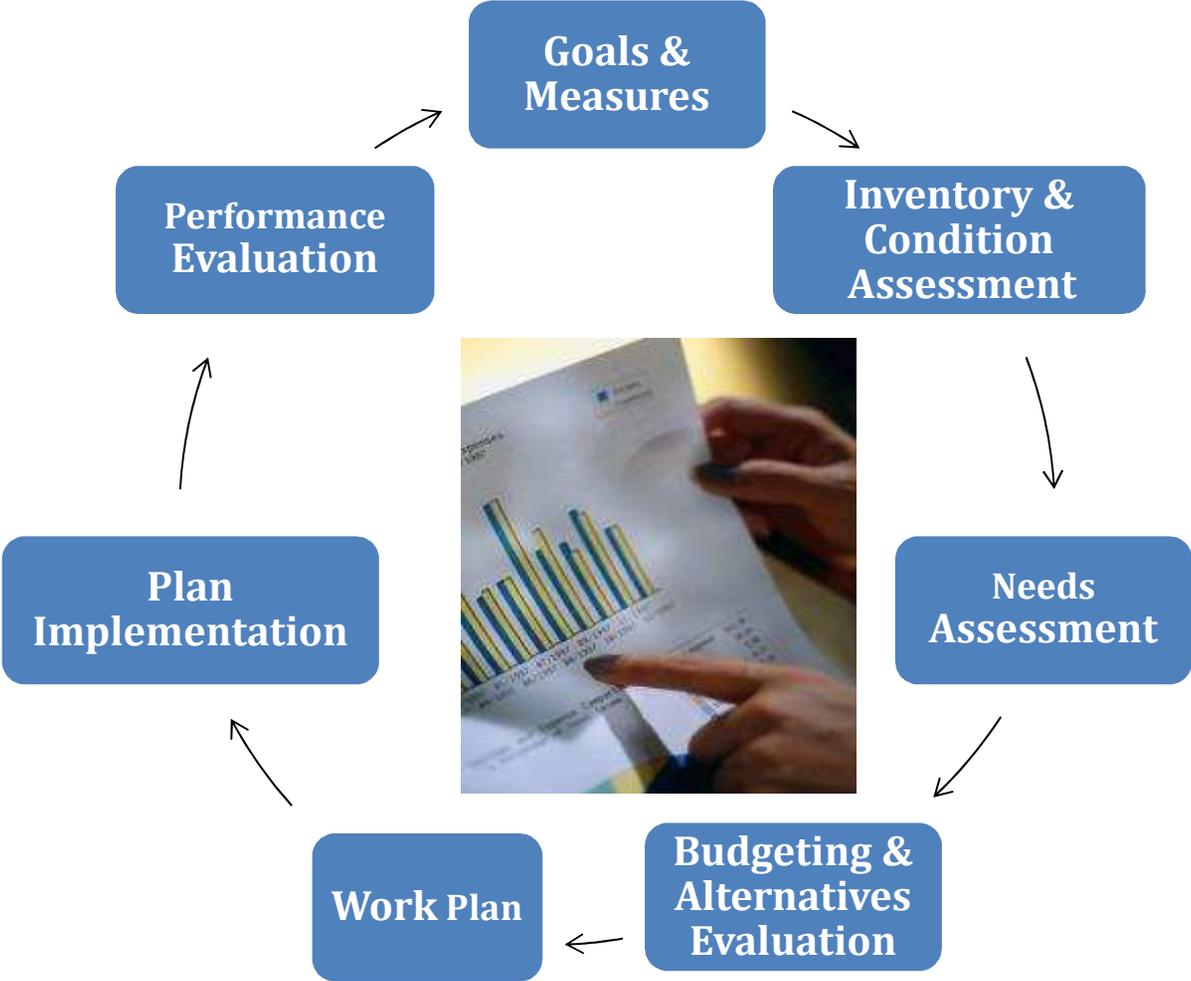
- Cost Effective
- Minimum Traffic Disruption
- Lower User Costs
- Public Safety
- Reduce Need to Rehab and Replace



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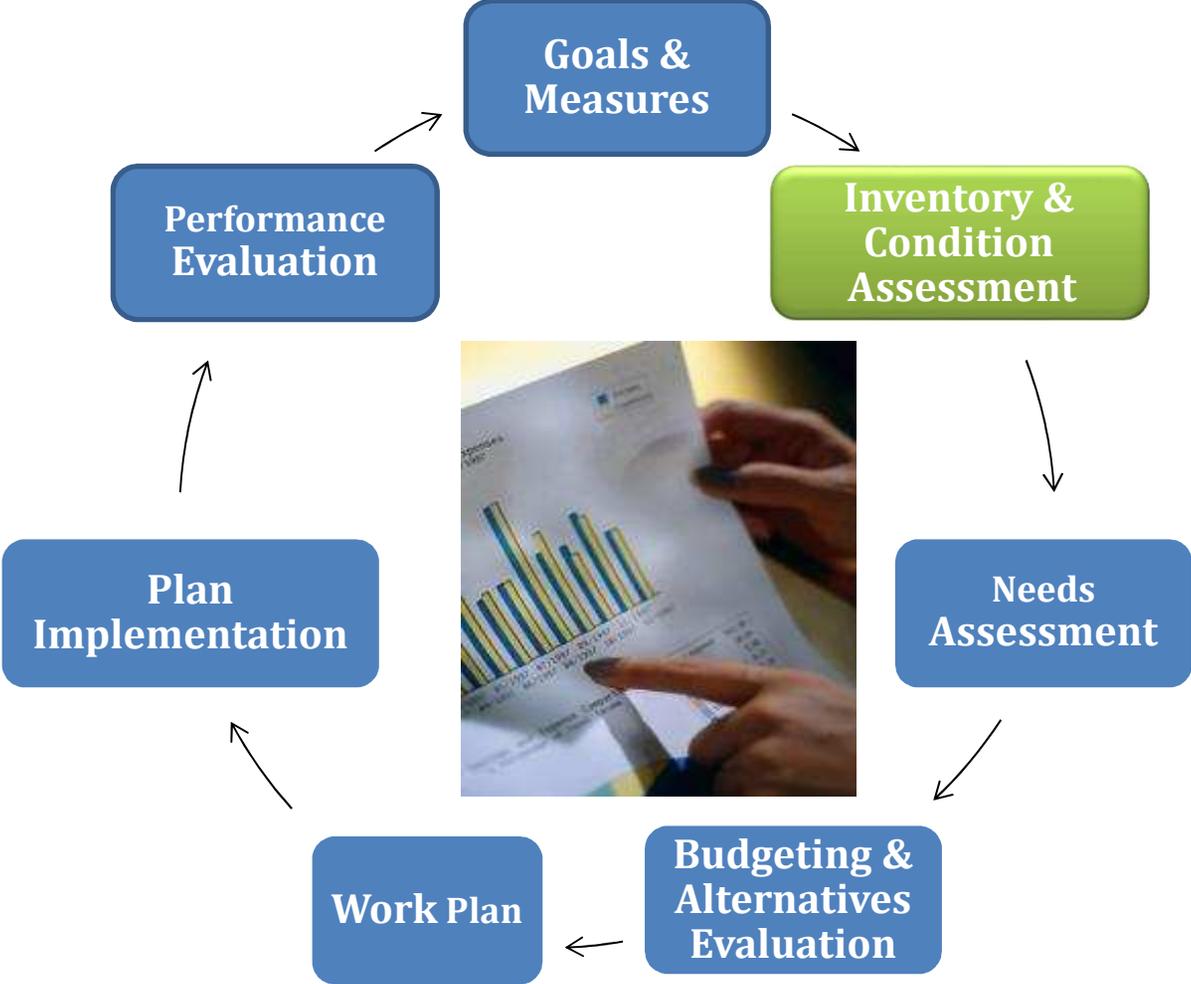
Systematic Preventive Maintenance



Systematic Preventive Maintenance



Systematic Preventive Maintenance



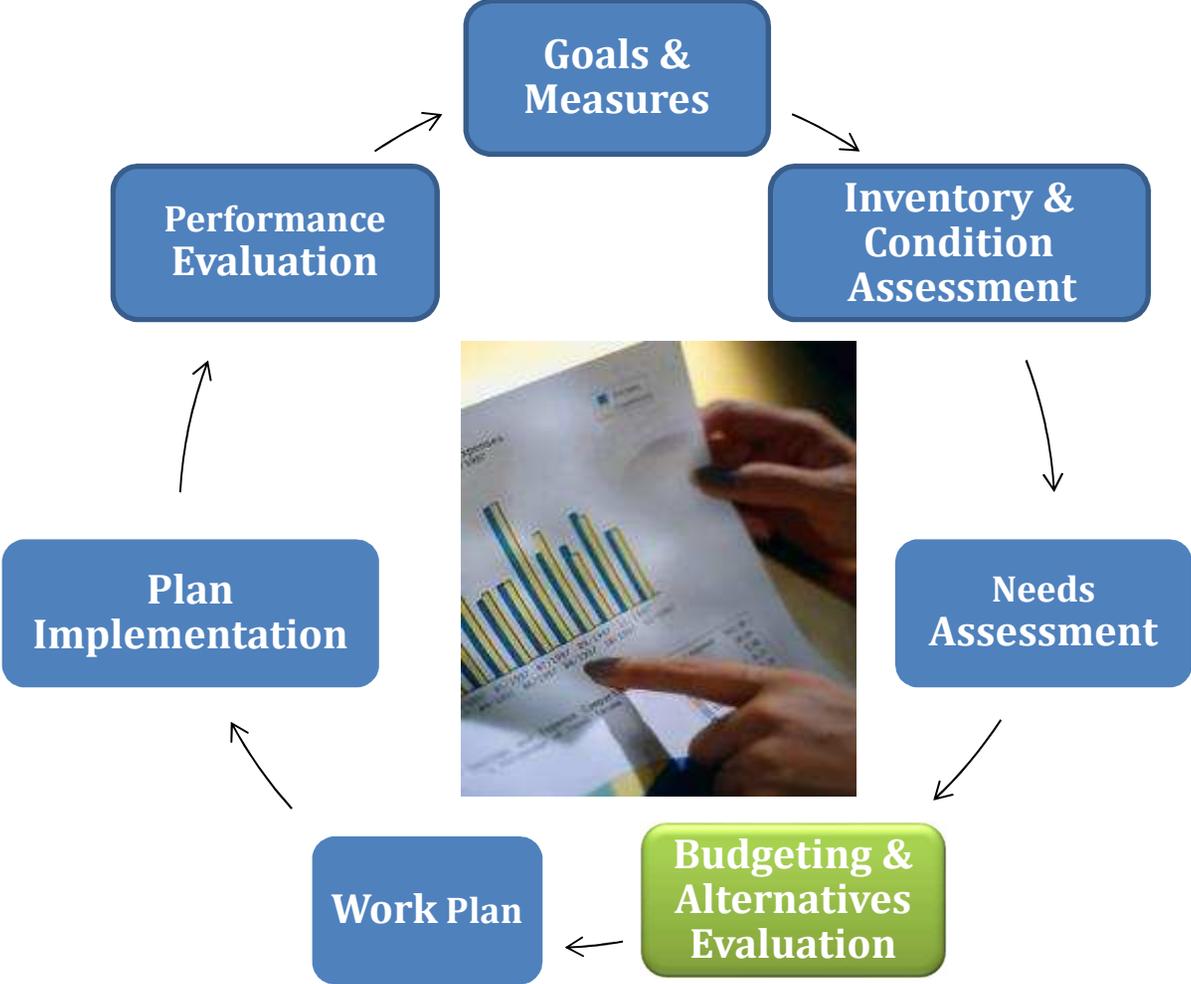
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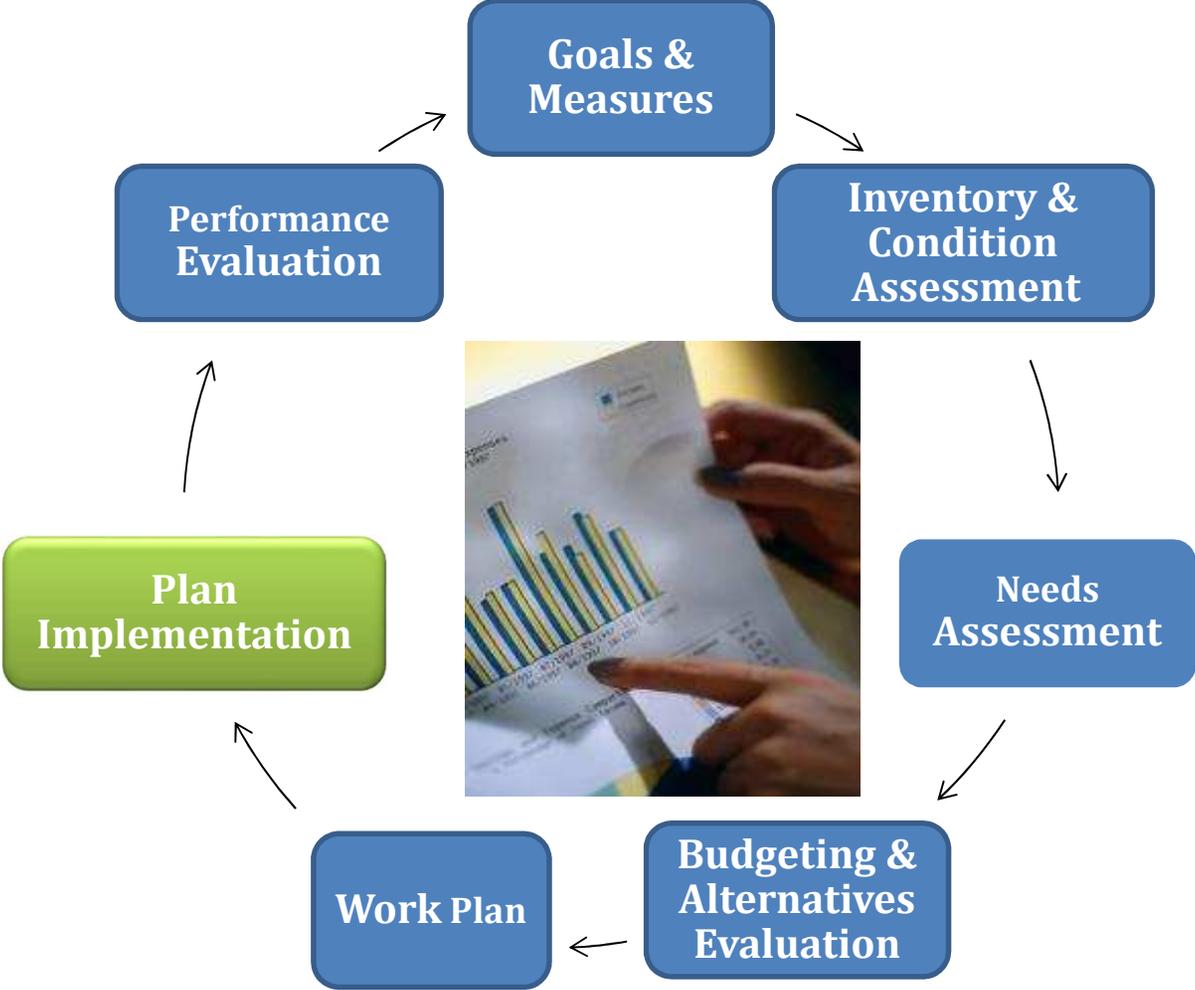
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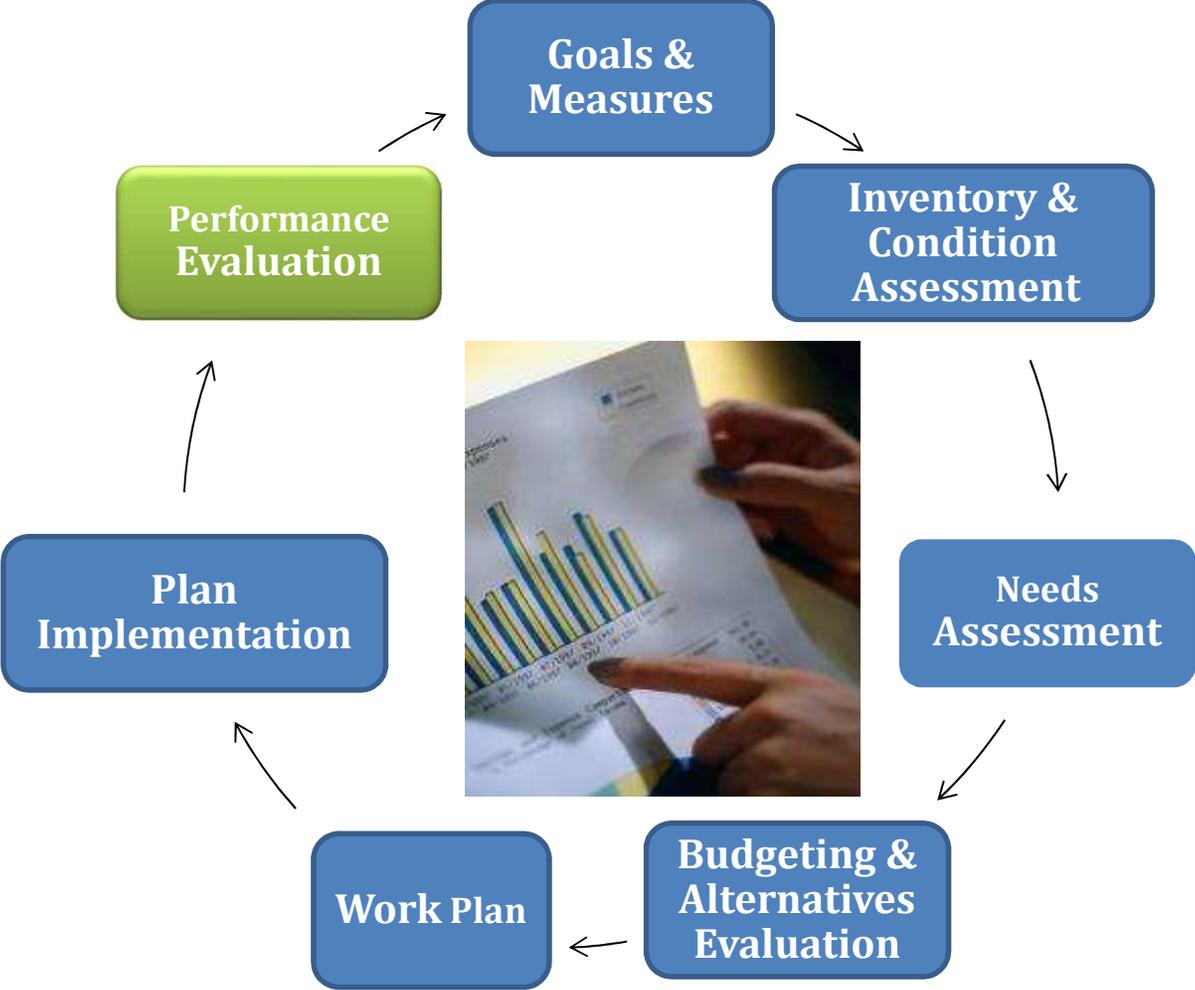
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Examples of Preservation Activities

□ Following are examples of preservation activities that can extend the life of bridges when applied to the appropriate bridge at the appropriate time:

1. Seal or replace leaking joints or elimination of deck joints



Examples of Preservation Activities

2. Deck overlays



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Examples of Preservation Activities

3. Spot, zone, and complete coating of structural steel elements.



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Examples of Preservation Activities

5. Installation of Cathodic Protection (CP) Systems.

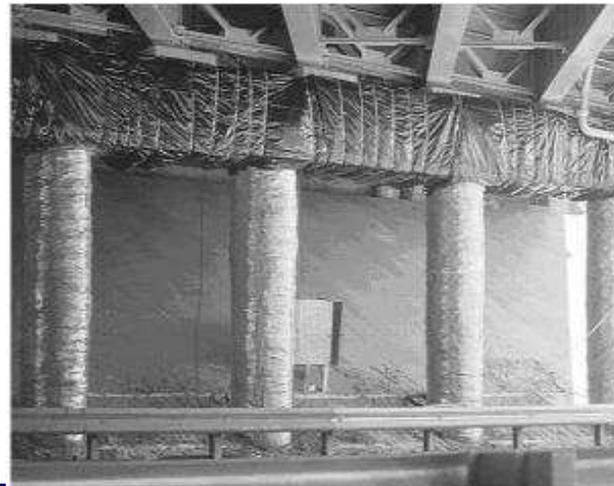


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Examples of Preservation Activities

6. Electrochemical Chloride Extraction (ECE) Treatment for decks and substructure elements



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Examples of Preservation Activities

7. Installations of scour countermeasures.
8. Removing large debris from channels.

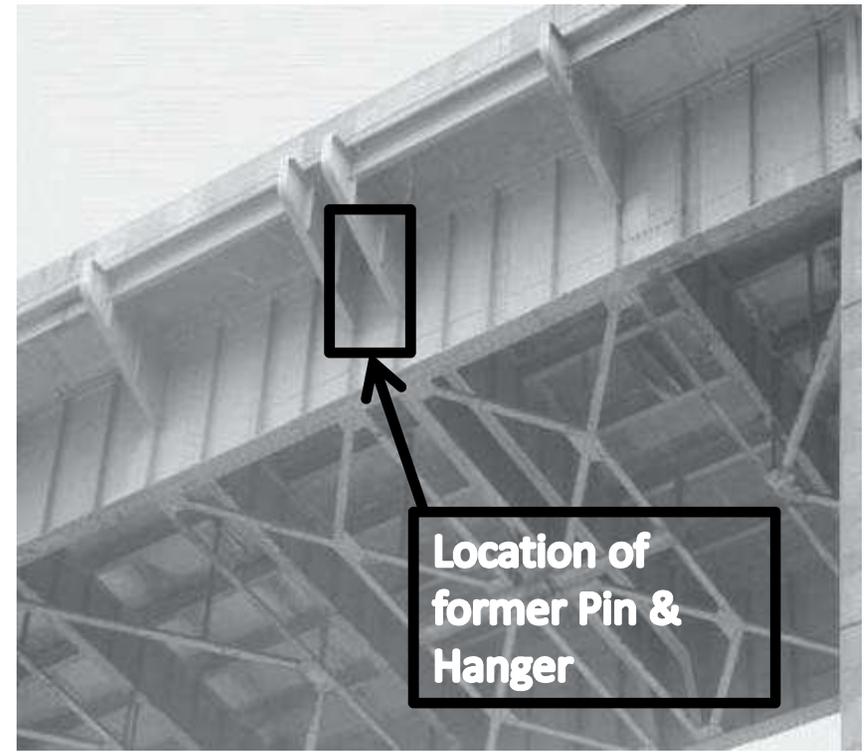


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Examples of Preservation Activities

- 9. Retrofit of fracture critical members
- 10. Retrofit of fatigue prone details



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Examples of Preservation Activities

11. Application of concrete sealants, coatings, and membranes.

12. Bridge cleaning and/or washing service.



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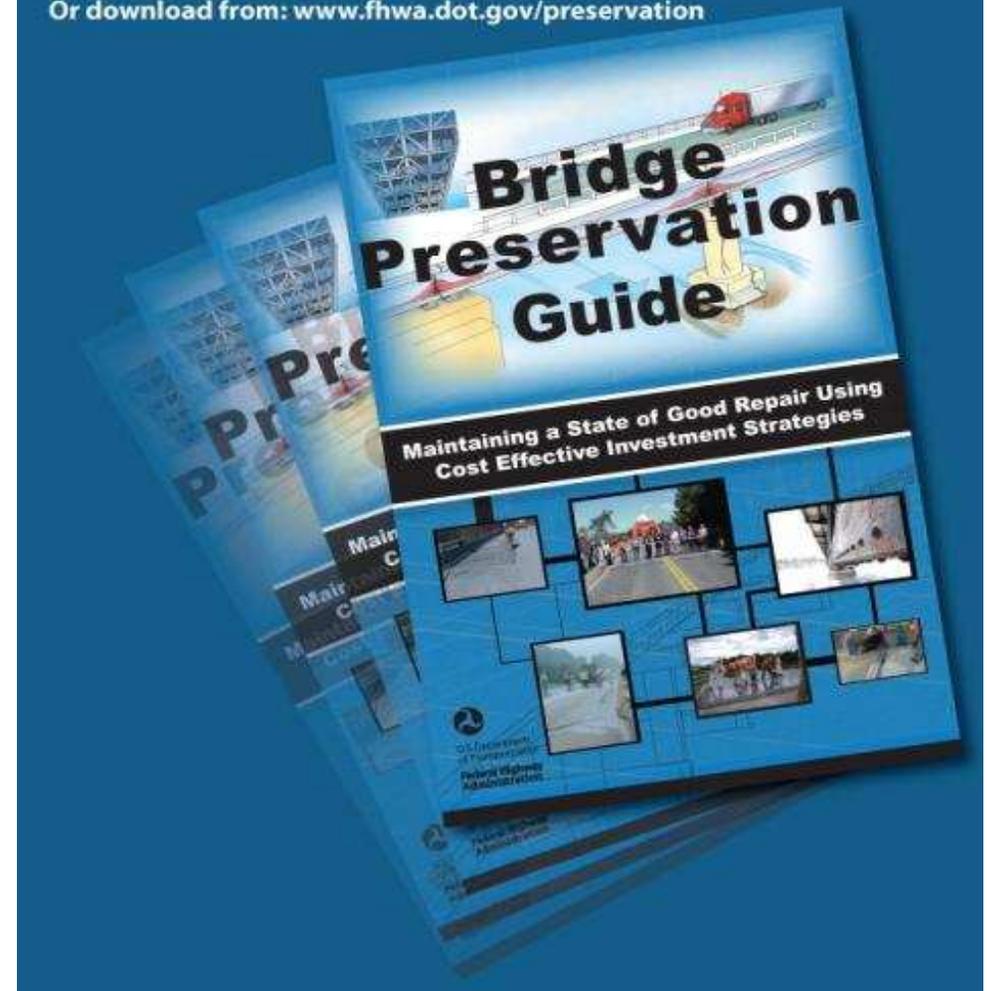
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Conclusion

- Bridge preservation is a fundamental component of bridge management.
- A balanced program addresses preservation, replacement, and improvement needs.
- Systematic preventive maintenance is eligible for federal aid funding.
- Preservation activities are effective when applied at the appropriate time to the appropriate bridge.
- Preservation activities are aimed to extending the life of bridges.
- Preservation activities cost much less than reconstruction and replacement.



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