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## **National Performance Measures for Bridge Needs**

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Bridge Development Engineer

Midwest Bridge Preservation Partnership Meeting  
Indianapolis, Indiana  
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## **Task Force on National Performance Measures and Reporting For Highway Bridges**

**Paul Cortez, Wyoming  
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## **MAP-21 Moving Ahead for Progress in the 21st Century**

- ***No more than 10% of the total bridge deck area in a State on the National Highway System can be classified as structurally deficient for a period of 3 years without a penalty being imposed. Title 23, U.S.C. §1119(f)(2)(A)***
- ***States must maintain the highway infrastructure asset system in a state of good repair. Title 23, U.S.C. §1119(b)(2)***



# FOUNDATIONAL OBJECTIVES ESTABLISHED

- *Use NBI data initially, prepare for adaptation to National Bridge Elements*
- *Productive communication: Poor bridges or poor pavement?*
- *SMART (Specific, measurable, attainable, realistic, timely)*
- *KISS (Keep it short and simple)*
- *National measure, State targets*
- *Reliable, transparent and understandable*
- *Retain preservation and maintenance as high priorities*
- *Consider deck area and number of structures*
- *Include all structures, not only those on NHS*

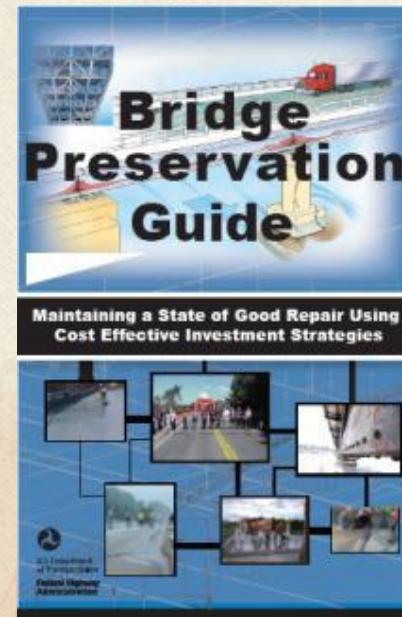
**States need flexibility to retain  
their existing measures!**

# Second Performance Measure Based Upon Bridge Preservation



Bridge Action Categories  
(Courtesy; FHWA Bridge  
Preservation Guide -

<http://www.fhwa.dot.gov/bridge/preservation/guide/guide.pdf>)



# Second Performance Measure

**CM**

**PM**

**RR**

Cyclic Maintenance  
Needs  
(Includes Routine  
Maintenance)  
NBI 7 – 9

Preventive Maintenance  
Needs  
(Includes Minor Rehab)  
NBI 5-6

Replacement or Rehab  
Needs  
(Includes Major Rehab)  
NBI 0-4



# CM - Cyclic Maintenance

- Bridge Washing
- Deck Sealing
- Cleaning debris from expansion joints



## NBI 7-9



# PM - Preventive Maintenance (Condition Based)

- Deck Patching
- Rigid Overlays
- Bridge Painting
- Substructure Patching



## NBI 5-6



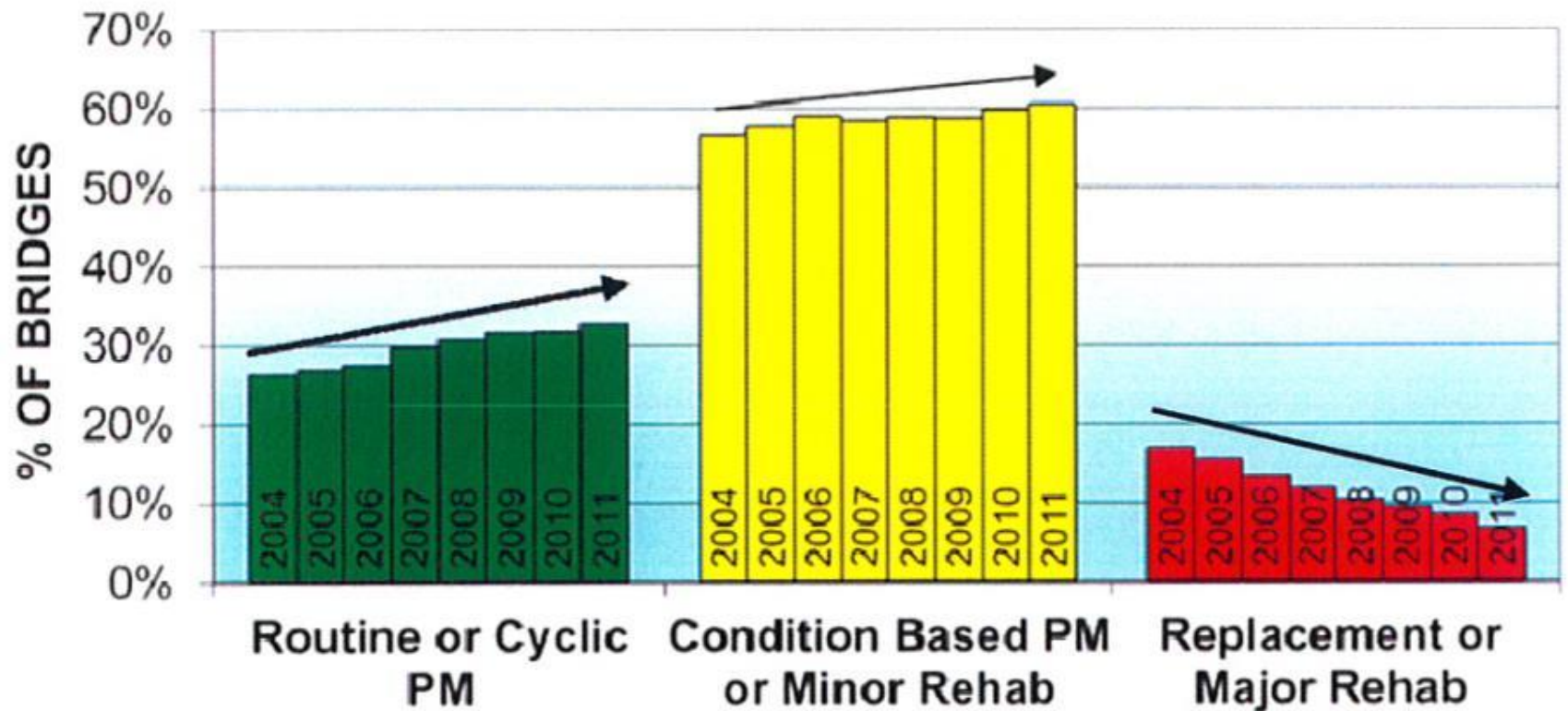
# RR – Major Rehabilitation and Replacement

- Deck Replacement
- Superstructure Replacement
- Bridge Replacement



## NBI 0-4

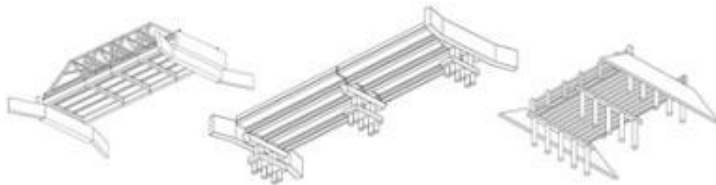
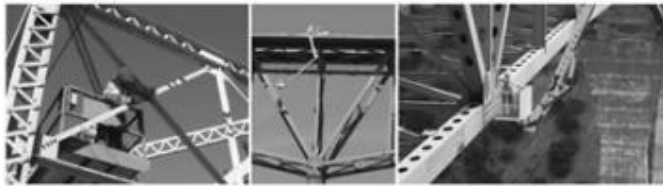
## 2004 - 2011 Bridge Condition All Roadway Bridges



# National Bridge Elements

## Manual for Bridge Element Inspection

First Edition, 2013



AMERICAN ASSOCIATION OF  
STATE HIGHWAY AND  
TRANSPORTATION OFFICIALS  
**AASHTO**  
THE VOICE OF TRANSPORTATION

### 3.7.1—Element 300—Strip Seal Expansion Joint

**Description:** Those expansion joint devices which utilize a neoprene type waterproof gland with some type of metal extrusion or other system to anchor the gland.

**Classification:** BME

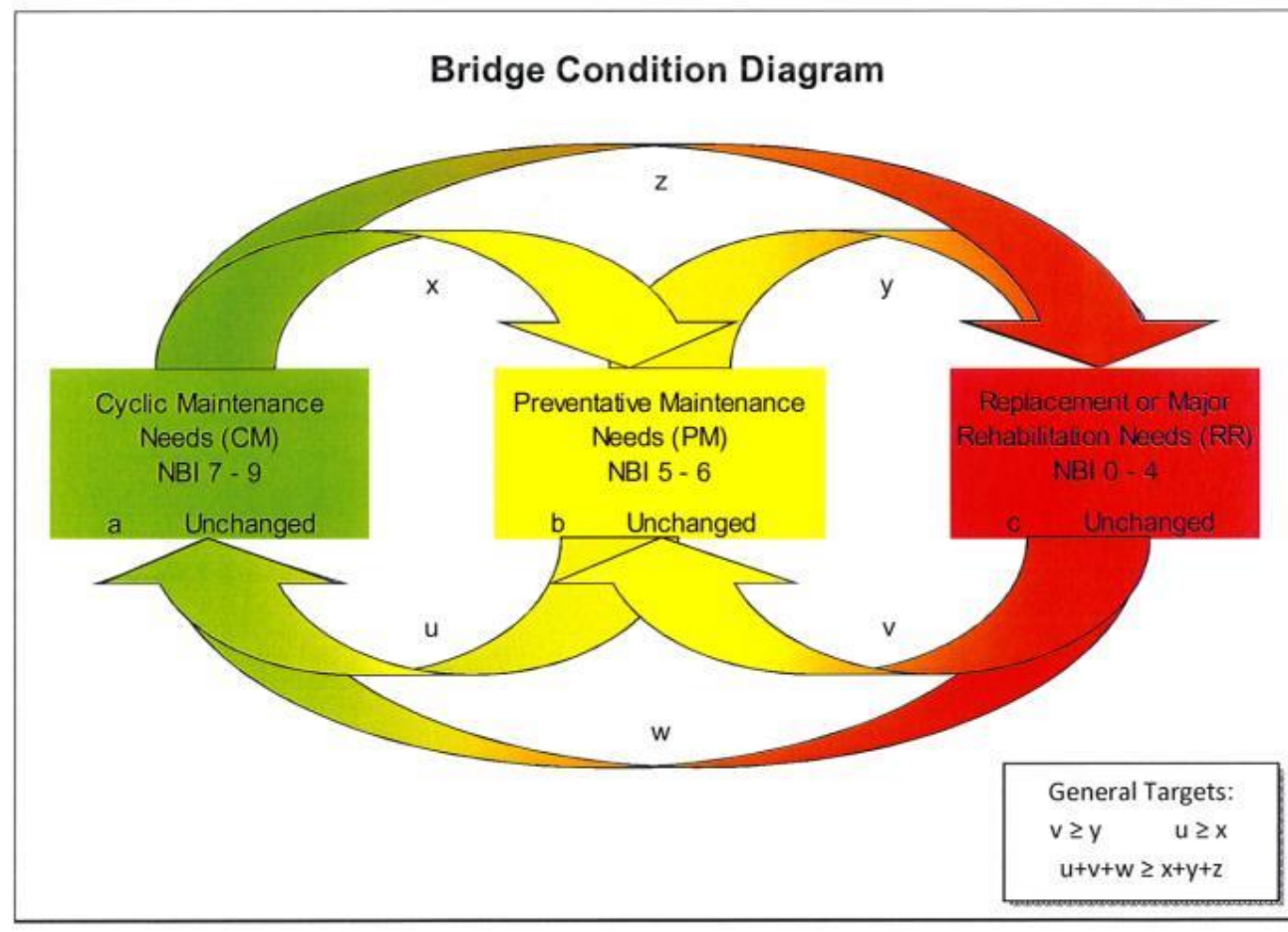
**Units of Measurement:** ft

**Quantity Calculation:** Sum of all the lengths of the joint measured along the skew angle.

#### Condition State Definitions

Defects	Condition States			
	1 GOOD	2 FAIR	3 POOR	4 SEVERE
Leakage (2310)	None.	Minimal. Minor dripping through the joint.	Moderate. More than a drip and less than free flow of water.	Free flow of water through the joint.
Seal Adhesion (2320)	Fully adhered.	Adhered for more than 50% of the joint height.	Adhered 50% or less of joint height but still some adhesion.	Complete loss of adhesion.
Seal Damage (2330)	None.	Seal abrasion without punctures.	Punctured or ripped or partially pulled out.	Punctured completely through, pulled out, or missing.
Seal Cracking (2340)	None.	Surface crack.	Crack that partially penetrates the seal.	Crack that fully penetrates the seal.
Debris Impaction (2350)	No debris to a shallow cover of loose debris may be evident but does not affect the performance of the joint.	Partially filled with hard-packed material but still allowing free movement.	Completely filled and impacts joint movement.	Completely filled and prevents joint movement.
Adjacent Deck or Header (2360)	Sound. No spall, delamination, or unsound patch.	Edge delamination or spall 1 in. or less deep or 6 in. or less in diameter. No exposed rebar. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Exposed rebar. Delamination or unsound patched area that makes the joint loose.	Spall, delamination, unsound patched area, or loose joint anchor that prevents the joint from functioning as intended.
Metal Deterioration or Damage (2370)	None.	Freckled rust; metal has no cracks, or impact damage. Connection may be loose but functioning as intended.	Section loss, missing or broken fasteners, cracking of the metal, or impact damage but joint still functioning.	Metal cracking, section loss, damage, or connection failure that prevents the joint from functioning as intended.

# Ultimate Goal – Maintain Bridges in a “State of Good Repair”



# Thank You

