

# NBIP: National Bridge Inspection Program

*Aligning Scour into Data Driven, Risk Based Approaches*



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presentation to

**SEBPP**

by

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# Purpose & Objectives

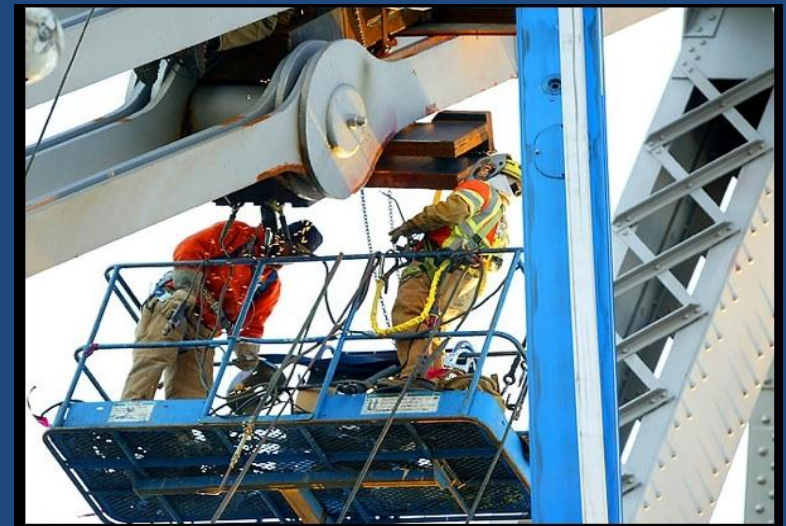
- Describe New NBIP oversight process
- Discuss application to scour metric
- Address your questions



# New NBIP Process

## Why?

- FHWA saw need
- Bridge failure high-risk
- States' concern about FHWA consistency
- I-35 W and OIG audits
- Congress said to improve our oversight





## New NBIP Process

# Pre-2011 Oversight Approach



- Recommended scope of annual reviews
  - Review of files, procedures and documentation
  - Site visits
  - NBI data checks
  - Interviews
- High degree of variability
- Annual summary reports

## **New NBIP Process**

# **What's Different?**

- **Consistency across the Nation**
- **Use of statistical samples**
- **Application of risk considerations**
- **Compliance status monitored quarterly**
- **Final compliance report on December 31<sup>st</sup>**

# New NBIP Process

## Specific Aspects

- **23 Individual Metrics**
  - Relate to specific requirements of the NBIS
- **3 Assessment Levels**
  - Defines specific review criteria and data sources
- **4 Levels of Compliance**
  - Defines specific compliance thresholds
- **Risk Consideration**
  - Structurally deficient, fracture critical, scour critical bridges = higher risk and lower tolerance
- **Clearer Reporting & Oversight**
  - Less burdensome

## New NBIP Process

# Specific Aspects: *Metrics*

- **Generic Definition**

*Quantified NBIS requirement by which one can make an assessment of compliance*

- **Specific Metric (#18)**

*650.313 (e) (3) - Bridges that are scour critical*

*Has a plan of action (POA) been prepared to monitor known and potential deficiencies and to address critical findings? Have bridges that are scour critical been monitored in accordance with the plan?*

# New NBIP Process

## Specific Aspects: *Metrics*

- Organization
- Program Manager qualifications
- Team leader qualifications
- Load Rater qualifications
- Underwater diver qualifications
- Routine inspection frequency
- Extended inspection frequency
- Underwater frequency
- Extended underwater frequency
- Fracture critical frequency
- Damage, in-depth, special frequency
- Inspection procedures
- Load rating procedures
- Posting procedures
- Bridge files
- Fracture critical procedures
- Underwater procedures
- Scour critical POAs
- Complex bridge procedures
- QC/QA procedures
- Critical findings procedures
- Inventory upkeep
- Timeliness of data updates



# New NBIP Process

## Specific Aspects: *Assessment Levels*

- Minimum

- General knowledge and awareness of the state's program in relation to the metric
- Analysis of NBI data

- In-depth

- Larger sample sizes
- More interviews
- Research of records and/or history

- Intermediate

- Sampling of inspection records or files
- Analysis of NBI data
- Visits to bridges
- Interviews
- Documentation of qualifications

# New NBIP Process

## Specific Aspects: *Compliance Levels*

- **Compliance**
  - Adhering to NBIS regulation.
- **Substantial Compliance**
  - Adhering to NBIS regulation with minor deficiencies. Deficiencies to be corrected within 12 months or less, unless deficiencies are related to issues that would most efficiently be corrected during next inspection.
- **Non-Compliance**
  - Not adhering to NBIS regulation. Identified deficiencies may adversely affect the program. Failure to adhere to an approved **plan of corrective action** is also considered non-compliance.
- **Conditional Compliance**
  - Taking corrective action in conformance with FHWA approved **plan of corrective action (PCA)** to achieve compliance with NBIS

## New NBIP Process

# Specific Aspects: *Non-Compliance*

- Plan of Corrective Actions (PCA)
  - Documented agreement with State
    - Process and schedule to correct deficiencies
    - Periodic reporting to monitor status



## New NBIP Process

# Specific Aspects: *Risk-Based*

- What Do We Mean By Risk?

**Strategy of Prioritizing the Vulnerable Bridges** using concepts of **Bridge Importance, Consequences of Failure, & Suitability of Approach** to develop an acceptable plan of action or plan of corrective action

## New NBIP Process

# Specific Aspects: *Risk-Based PCA/POA*

- **Vulnerability**: Bridge metrics of sufficient importance so that compliance is imperative
- **Prioritization**: Measure of the ranking of or sequence for taking an action at bridges
  - **Bridge Importance**: Focus on bridges of more significance relative to other bridges
  - **Consequence of Failure**: Measure of how loss of a bridge impacts public safety, disrupts transportation, & incurs economic costs for correction or replacement
  - **Suitability of Approach**: Relative appropriateness of a type of remedial approach (e.g., scour countermeasure) given Bridge Importance & Consequence of Failure



## New NBIP Process

# Specific Aspects: *Risk & Vulnerability*

## **Metric 18:** Scour at Bridges

- **SCOUR CRITICAL**
  - Compliance (C): Yes.
  - Substantial Compliance (SC): NA.
  - Non-Compliance (NC): Less than 100%.
  - Conditional Compliance (CC): Adhering to approved **plan of corrective action**.

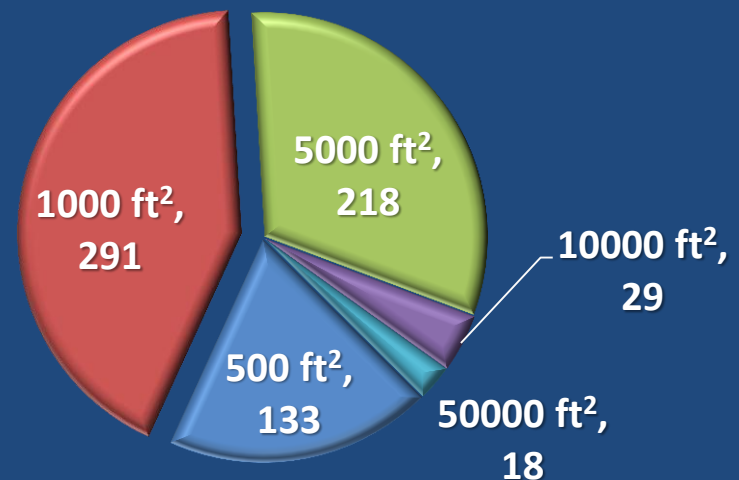
## New NBIP Process

# Specific Aspects: *Risk & Prioritization*

## Metric 18: Scour at Bridges

- How to Prioritize?
  - Make Data Driven
- What Data?
  - NBI Data
    - Functional Classification
    - Average Daily Traffic
    - Detour Length
    - Deck Length/Area
    - Other (Owner)

Oklahoma - Scour Critical  
Using Deck Area (ft<sup>2</sup>)

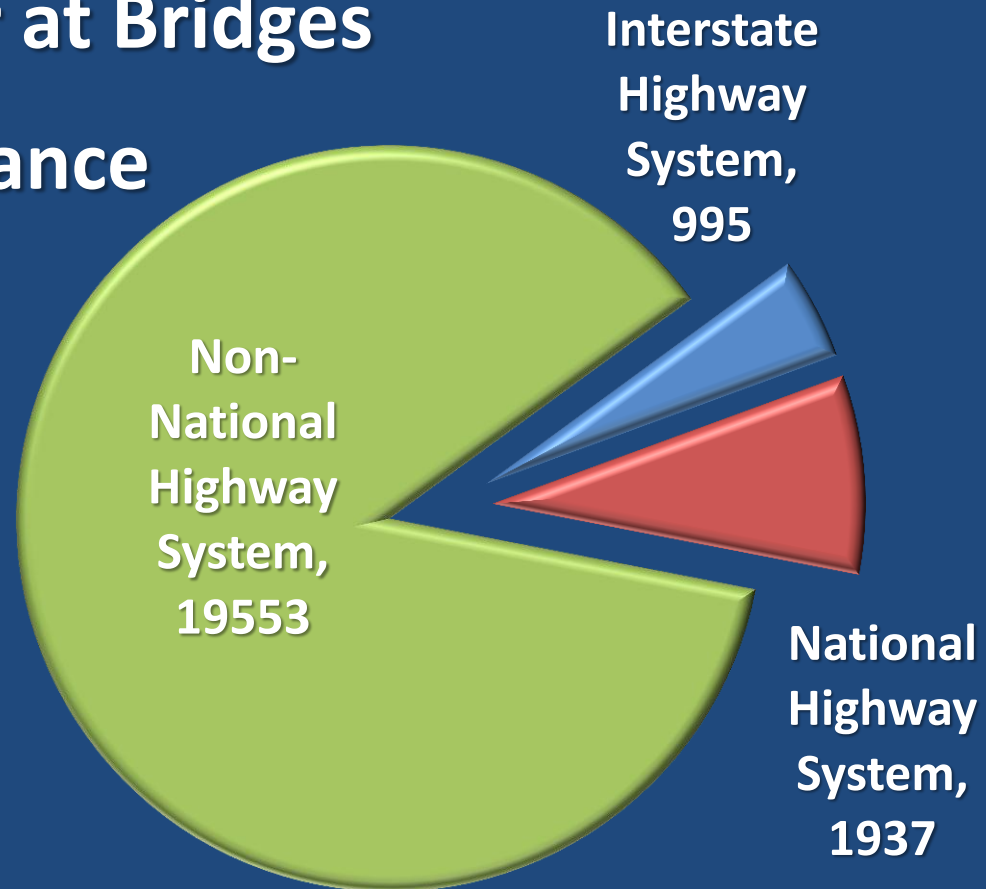


# New NBIP Process

## Specific Aspects: *Risk & Importance*

### Metric 18: Scour at Bridges

- Bridge Importance



2009 NBI Data:

IHS: 991

NHS: 1935

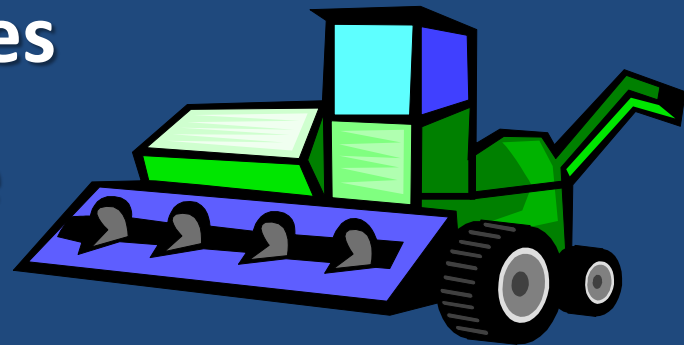
NNHS: 18162

## New NBIP Process

# Specific Aspects: *Risk & Consequences*

## Metric 18: Scour at Bridges

- Consequence of Failure
  - Low
    - Low ADT
    - Non-NHS Bridge
  - Medium
    - State Bridge
  - High
    - Interstate
    - School Bus Route



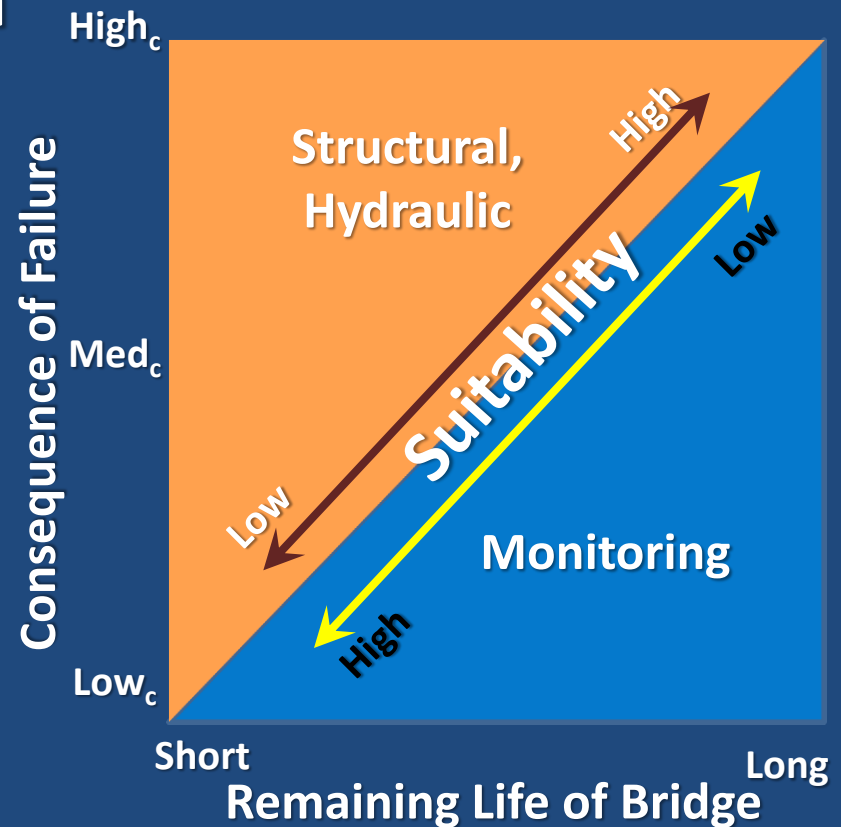
# New NBIP Process

## Specific Aspects: *Risk & Suitability*

### Metric 18: Scour at Bridges

- **Suitability of Approach**

1. Interstate
  - Consequence = High<sub>c</sub>
  - Life = Long
  - CM Type: Structural or Hydraulic
2. Low ADT Bridge
  - Consequence = Low<sub>c</sub>
  - Life = Immaterial
  - CM Type: Monitoring
3. NHS Bridge, Long Detour
  - Consequence = Mid<sub>c</sub> to High<sub>c</sub>
  - a. Life = **Long**  
CM Type: Structural or Hydraulic
  - b. Life = **Short**  
CM Type: Monitoring





# New NBIP Process

## Specific Aspects: *Reporting*

### Assessment Reporting Tool (ART)

Metric View

WASHINGTON DFS West

7 23 CFR 650.311 Inspection frequency - Routine Extended

Metric Definition	Metric Regulation
If FHWA approval has been granted for extended inspection interval, are bridges being inspected in accordance with the approved criteria? Are controls in place to ensure sustained compliance with the approved criteria?	650.309 (a) (3) - Routine Inspections - Extended Interval

Close Form

View Assessment Type Descriptions

Compliance is:	Substantial Compliance is:	Non Compliance is:
Yes or does not apply	At least 98% of all applicable bridges have been inspected in accordance with the established and approved criteria. At most 2% of these bridges have been inspected no more than 4 months beyond the scheduled inspection date.	Less than 98% of all applicable bridges have been inspected in accordance with the established and approved criteria. Greater than 2% of these bridges inspected within 4 months beyond the scheduled inspection date. Any bridge delinquent for inspection by more than 4 months. Any bridge found with an extended inspection interval that does not meet the approved criteria.

Year: 2009 Add Another Year

Assessment Level: Intermediate

Date DA Notified: 2/1/2011

"Push Button" Report

Add an Observation

Enter Population: Sample Tier 1 [ ] Sample Tier 2 [ ]

Attachment for 2009

Attach File

Date	Observation:	Compliance Snapshot
5/26/2010	<input checked="" type="checkbox"/> Reviewed 2009 NBI database and queried all bridges with inspection frequencies greater than 24 months. 454 bridges met this criteria. I used a random number generator to identify 15 records for review. I developed a spreadsheet to list the values in the NBI for the criteria specified in the May	Non Compliant

Washington State D [ ] Edit/View

## **New NBIP Process**

# **Important Takeaways**

- **New process to be used in 2011**
- **Former annual NBIS summary report discontinued after 2010**
- **Compliance of 23 metrics rather than single overall determination**
- **NBIS regulation DID NOT CHANGE!!**
- **Implementation assistance available from Bridge Safety Engineers**
- **Level of effort may be higher than the past**

# Questions

