

# **National Bridge Inspection Program**

**Risk-based, Data-driven FHWA  
Oversight**

March 23, 2011

# What will this affect?

- **New NBIS regulations are not being created**
- **Overhaul of how FHWA monitors and assesses MDOT and Local Agency compliance with the NBIS including:**
  - **clear and uniform expectations for all States.**
  - **consistent criteria for judging each metric.**
  - **compliance determination based upon the criteria listed for each metric rather than an unstructured policy.**

# Background: Why are we doing this?

- Recognition by FHWA of several opportunities for improvement
- NBIP continually identified as high-risk area
- Concerns by States that level of oversight is not consistent across the nation
- **OIG audits following I-35W bridge collapse**
- **FY 2010 Appropriations Act - *“The Committee expects the Federal Highway Administration to **make more significant progress in improving its oversight of bridge conditions and safety over the course of fiscal year 2010.**”***

# OIG Audit Recommendations

## 1. Develop and implement an oversight program

- Minimum requirements for reviews
  - data-driven, risk based bridge oversight during annual NBIS compliance reviews
- Detailed criteria to be met
  - Determine compliance with greater consistency
- A policy
  - Define procedures for FHWA Division Offices to follow to enforce compliance with the NBIS

# OIG Audit Recommendations

## 2. Develop comprehensive plan

- Routinely conduct systematic, data-driven analysis to identify nationwide bridge safety risks
- Prioritize identified risks
- Target higher priority risks
- In implementing the plan:
  - Direct HIBT to prioritize nationwide bridge safety risks.
  - Direct Division Offices to work with states to remediate higher priority nationwide bridge safety risks

# FHWA NBIP oversight today

- Typical annual review
  - review of files and documentation
  - on-site bridge visits
  - NBI data checks
  - Interviews
  - review of procedures
- General guidance offered
- Single overall assessment of compliance
- Annual summary report

# What does the new NBIP oversight process look like?

- 23 Individual Metrics. Each metric ...
  - Covers a specific requirement of the NBIS
- 3 Assessment Levels with Each level ...
  - Having specific criteria to be reviewed
- 4 Levels of Compliance. Each level ...
  - Having specific thresholds to meet for compliance

# National Bridge Inspection Standards (NBIS) Metrics

*Metric #1: 23 CFR 650.307 Bridge inspection organization*

*Metric #2: 23 CFR 650.309 Qualifications of personnel – Program Manager*

*Metric #3: 23 CFR 650.309 Qualifications of personnel – Team Leader(s)*

*Metric #4: 23 CFR 650.309 Qualifications of personnel – Load Rating Engineer*

*Metric #5: 23 CFR 650.309 Qualifications of personnel – UW Bridge Inspection Diver*

*Metric #6: 23 CFR 650.311 Inspection frequency – Routine*

*Metric #7: 23 CFR 650.311 Inspection frequency – Routine Extended*

*Metric #8: 23 CFR 650.311 Inspection frequency – Underwater*

*Metric #9: 23 CFR 650.311 Inspection frequency – Underwater Extended*

*Metric #10: 23 CFR 650.311 Inspection frequency – Fracture Critical*

*Metric #11: 23 CFR 650.311 Inspection frequency – Damage, In-depth or Special*

*Metric #12: 23 CFR 650.313 Inspection procedures – Team Leader*

*Metric #13: 23 CFR 650.313 Inspection procedures – Load Rating*

*Metric #14: 23 CFR 650.313 Inspection procedures – Post or Restrict*

*Metric #15: 23 CFR 650.313 Inspection procedures – Bridge Files*

*Metric #16: 23 CFR 650.313 Inspection procedures – Fracture Critical Members*

*Metric #17: 23 CFR 650.313 Inspection procedures - Underwater*

*Metric #18: 23 CFR 650.313 Inspection procedures – Scour Critical Bridges*

*Metric #19: 23 CFR 650.313 Inspection procedures – Complex Bridges*

*Metric #20: 23 CFR 650.313 Inspection procedures – QC/QA*

*Metric #21: 23 CFR 650.313 Inspection procedures – Critical Findings*

*Metric #22: 23 CFR 650.315 Inventory – Prepare and Maintain*

*Metric #23: 23 CFR 650.315 Inventory – Update Data*



# Assessment Levels

- **Minimum**: Division Bridge Engineer's general knowledge and awareness of the state's program in relation to the metric.
- **Intermediate**: Verifying minimum level review through sampling of inspection records or files, analysis of NBI data, visits to bridges, interviews of inspectors, and documentation of qualifications
- **In-depth**: Supplementing intermediate review with larger sample sizes, more interviews, and research of records and/or history

# Compliance Definitions

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

## **Metric #6: 23 CFR 650.311 Inspection frequency – Routine**

650.311 (a) (1) & (2) – Routine inspections

Have all bridges been inspected at regular intervals not exceeding 24 months? Have criteria to determine level and frequency for which bridges that require inspection at less than 24 months been established?

**Criteria:** Percent of bridges inspected in accordance with the established criteria and frequency.

### **Assessment Levels**

**Minimum:** Based on Division Office Bridge staff's knowledge and awareness of Agency's process for ensuring bridge inspections are performed on schedule. Generate standard reports on current and historical inspection frequency data and review results.

**Intermediate:** Generate standard reports on current and historical inspection frequency data and review results. Randomly sample using a MOE of 15% and a LOC of 80% to review bridge inspection records, including a historical review of reports, to ensure frequency in the records match the data recorded in the NBI. The sample population should include structurally deficient and load restricted bridges, as well as bridges that require inspection at less than 24 months, as applicable. The review should include some site visits.

**In-depth:** Generate standard reports on current and historical inspection frequency data and review results. Randomly sample using a MOE of 15% and a LOC of 90% to review bridge inspection records, including a historical review of reports, to ensure frequency in the records match the data recorded in the NBI. The sample population should include structurally deficient and load restricted bridges, as well as bridges that require inspection at less than 24 months, as applicable. Review criteria for establishing inspection intervals less than 24 months and ensure that the sampling includes bridges covered by the criteria. The review must include some site visits.

## **Compliance Levels**

**Compliance (C):** Yes. - All 100%

**Substantial Compliance (SC):** 100% of all structurally deficient or load restricted bridges (NBI item 41 coded as P or R) have been inspected in accordance with the established frequencies. At least 98% of all other bridges have been inspected in accordance with the established frequency. At most 2% of all other bridges have been inspected no more than 4 months beyond the scheduled inspection date.

**Non-Compliance (NC):** Less than 100% of all structurally deficient or load restricted bridges have been inspected in accordance with the established frequencies. Less than 98% of all other bridges have been inspected in accordance with the established frequency. Greater than 2% of all other bridges inspected within 4 months beyond the scheduled inspection date. Any bridge delinquent for inspection by more than 4 months.

**Conditional Compliance (CC):** Adhering to approved plan of corrective action.

**Sample Size Table**

Sample Size	Populations			
	Intermediate AL - (LOC of 80%)		In-depth AL - (LOC of 90%)	
	Tier 1 - (MOE of 15%)	Tier 2 - (MOE of 10%)	Tier 1 - (MOE of 15%)	Tier 2 - (MOE of 10%)
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	7	6	6	6
7	9	7	8	7
8	11	8	9	8
9	14	9	11	9
10	17	10	13	10
11	21	13	15	12
12	27	15	17	13
13	34	17	20	15
14	43	19	24	16
15	57	21	26	18
16	80	24	29	19
17	123	26	34	21
18	235	29	37	23
19	Over 1,248	32	44	25
20		35	50	27
21		39	58	28
22		42	68	31
23		47	80	33
24		52	95	35
25		57	116	37
26		63	144	40
27		70	187	42
28		77	257	45
29		86	395	48
30		97	794	51
31		109	Over 14,154	54
32		124		57
33		142		60
34	165	64		
35	193	68		
36	232	72		
37	286	76		
38	366	81		
39	498	85		
40	759	91		
41	1,512	97		
42	Over 27,668	103		
43		110		

NBIP Metrics Assessment Projected Schedule

Metric	Description	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
		CY 2011	CY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	CY 2021
1	Br. Insp. Organization	Yellow	Green	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Green
2	PM Qualification	Yellow	Green	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Green
3	TL Qualification	Yellow	Green	Green	Yellow	Green	Green	Yellow	Green	Green	Green	Green
4	Load Rater Qualifn	Yellow	Blue	Green	Green	Green	Green	Yellow	Green	Green	Green	Green
5	U/W Diver Qualifn	Yellow	Green	Green	Green	Blue	Green	Green	Green	Yellow	Green	Green
6	Routine Insp. Freq.	Yellow	Green	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Green
7	Routine- Exten. Freq.	Yellow	Green	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Green
8	U/W Insp. Freq.	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Green	Yellow	Green
9	U/W Insp.- Exten. Freq.	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Yellow	Green	Green
10	FC Insp. Freq.	Yellow	Green	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green
11	Dam., In-Depth, Special Insp Freq.	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Green	Green	Yellow
12	TL Procedures	Yellow	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Green
13	Load Rating Procedures	Yellow	Blue	Green	Green	Green	Green	Yellow	Green	Green	Green	Green
14	Posting Procedures	Yellow	Yellow	Green	Green	PCA Ends	Yellow	Green	Green	Green	Yellow	Green
15	Bridge Files Procedures	Yellow	Green	Green	Yellow	Green	Green	Green	Blue	Green	Green	Green
16	FC Procedures	Yellow	Green	Green	Yellow	Green	Green	Green	Blue	Green	Green	Green
17	U/W Procedures	Yellow	Green	Green	Green	Blue	Green	Green	Green	Yellow	Green	Green
18	Scour Critical POAs	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Blue	Green	Green
19	Complex Bridge Insp. Procedures	Yellow	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Green
20	QC/QA Procedures	Yellow	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Green	Green
21	Critical Findings Procedures	Yellow	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Green	Green
22	State Inventory of Bridges	Yellow	Green	PCA Ends	Yellow	Green	Green	Green	Yellow	Green	Green	Green
23	Timeliness of Data Updates	Yellow	Green	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green

Key:	Green	Minimum Assessment
	Yellow	Intermediate Assessment
	Blue	In-Depth Assessment
	Green with dots	5-Yr Summary & Trend Analysis

# **In Summary: What does the new NBIP oversight process accomplish?**

- Provides an evaluation process consistent across the Nation
- Establishes compliance with the NBIS is determined upon statistical sampling
- Allows compliance status to be continuously updated
- “Final Summary of Metric Compliance Report” reported annually on December 31 has 23 measures instead of the historic 1

# Questions





