

Bridge Safety Inspection Quality Assurance for MDOT and Local Agencies



Presented by: Great Lakes Engineering Group

Organization of the Project Team

Michigan Department of Transportation



MDOT Project Manager

Richard Kathrens, P.E.

Great Lakes Engineering Group LLC

Project Manager/Qualified Team Leader

Amy Trahey, P.E.



QA Engineer/Qualified Team Leader

Eric Rickert, P.E.

Casey Collings, P.E.

Evan Currie, P.E.

Overview

- Purpose of QA/QC Project
 - Increase consistency and accuracy of inspections
 - Heighten awareness of National Bridge Inspection Standards (NBIS) requirements
 - Provide a system of checks and balances on bridge inspections
 - Ensure that written documentation exists in an acceptable structure

Overview

● Timeline

- 2004: Changes to NBIS, new requirements for QA/QC
- 2007: QA/QC reviews begin for all agencies in Michigan
- 2015: Reviews ongoing, most bridge owners have participated in a QA or QC review
- 2016: Heads up Superior Region

Overview

- QA vs. QC

- Quality Control (QC)¹ – Procedures that are intended to maintain the quality of a bridge inspection and load rating at or above a specified level.
- Quality Assurance (QA)¹ – The use of sampling and other measures to ensure the adequacy of quality control procedures in order to verify or measure the quality level of the entire bridge inspection and load rating program.



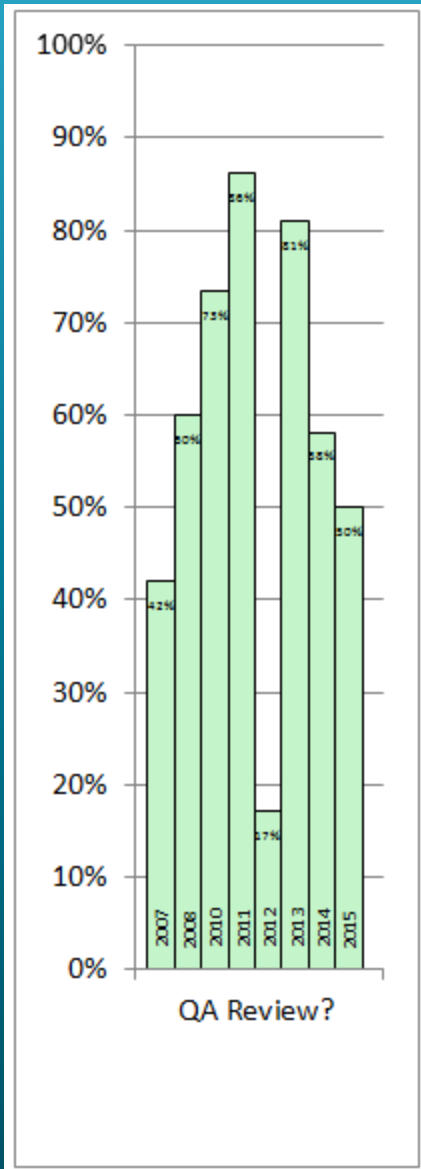
¹CFR Vol. 69, No. 239, Part 650, Subpart C – National Bridge Inspection Standards

Review Process

- Each review consists of:
 - Initial meeting with bridge owner and inspector
 - Discussion of current quality control measures
 - File review of a sample of bridges
 - Field review of a sample of bridges
 - Close out meeting, recommendations

Total Number of Bridges in Inventory	Quality Assurance Review	
	File Review	Field Review
All Inventory Sizes	10% of Inventory	5%, maximum of 5
Total Number of Bridges in Inventory	Quality Control Review	
	File Review	Field Review
All Inventory Sizes	10% of Inventory	5% of Inventory

Review Process

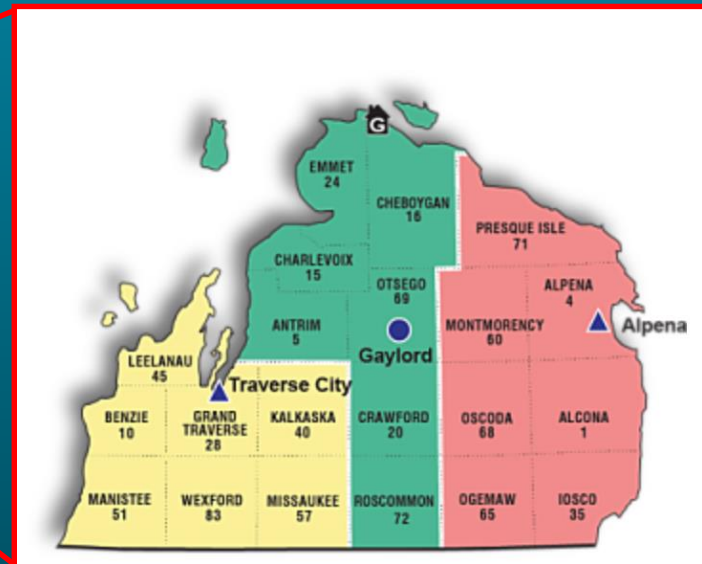
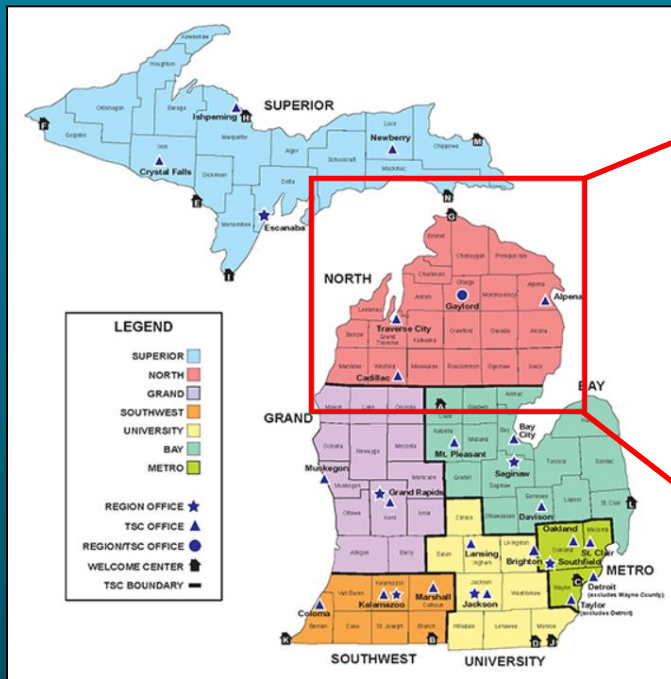


- QA Review performed when:
 - Quality Control is already being performed
 - All required components of the program included
 - Major components of the program included
- QC Review performed when:
 - Agency is not performing adequate QC
 - Some key program components needed
 - Major program components missing

Findings

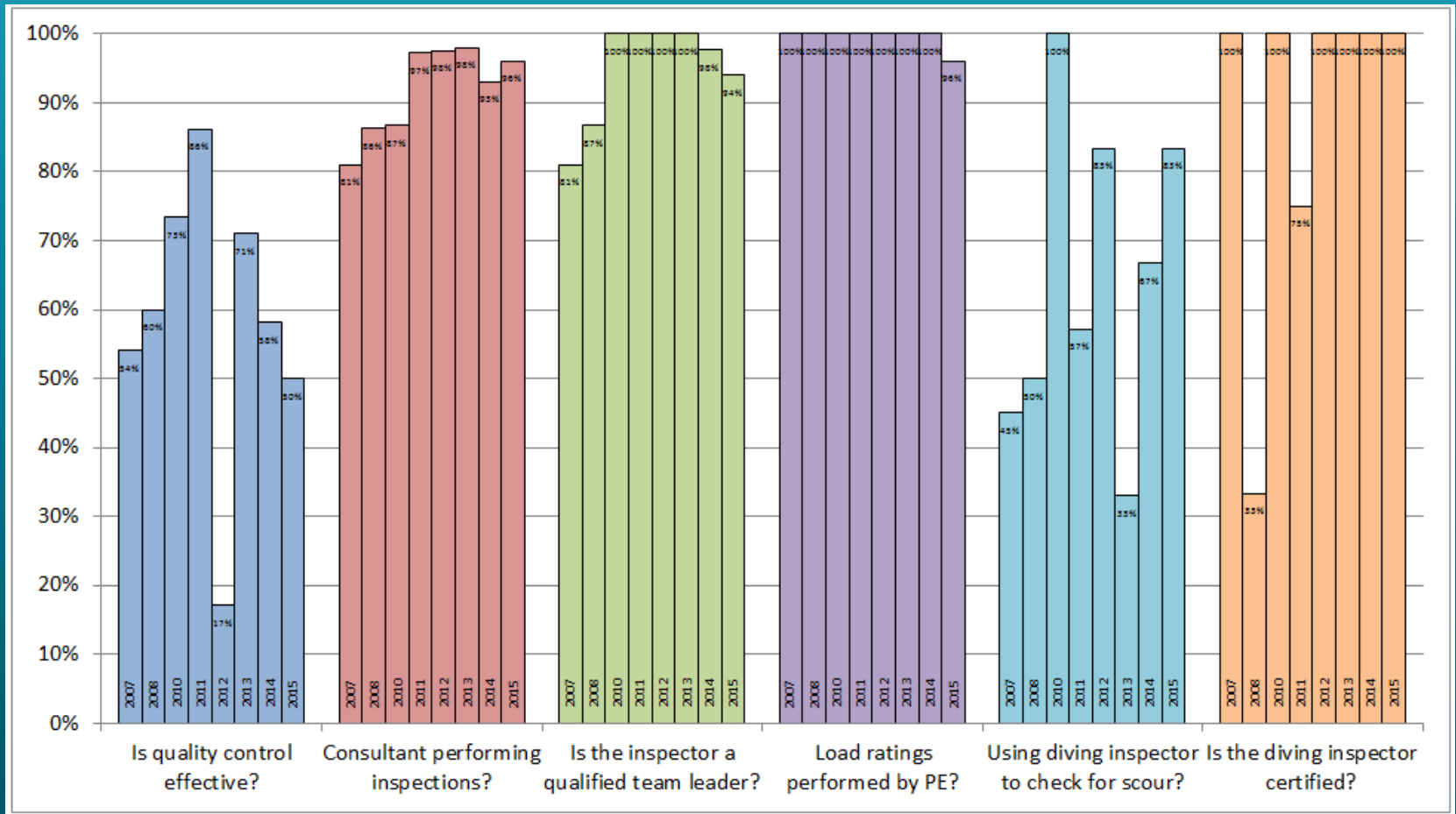
2015 – North Region

- 50 agencies reviewed (25 local, 24 county, 1 region)
- 50% of agencies received a QA review in 2015



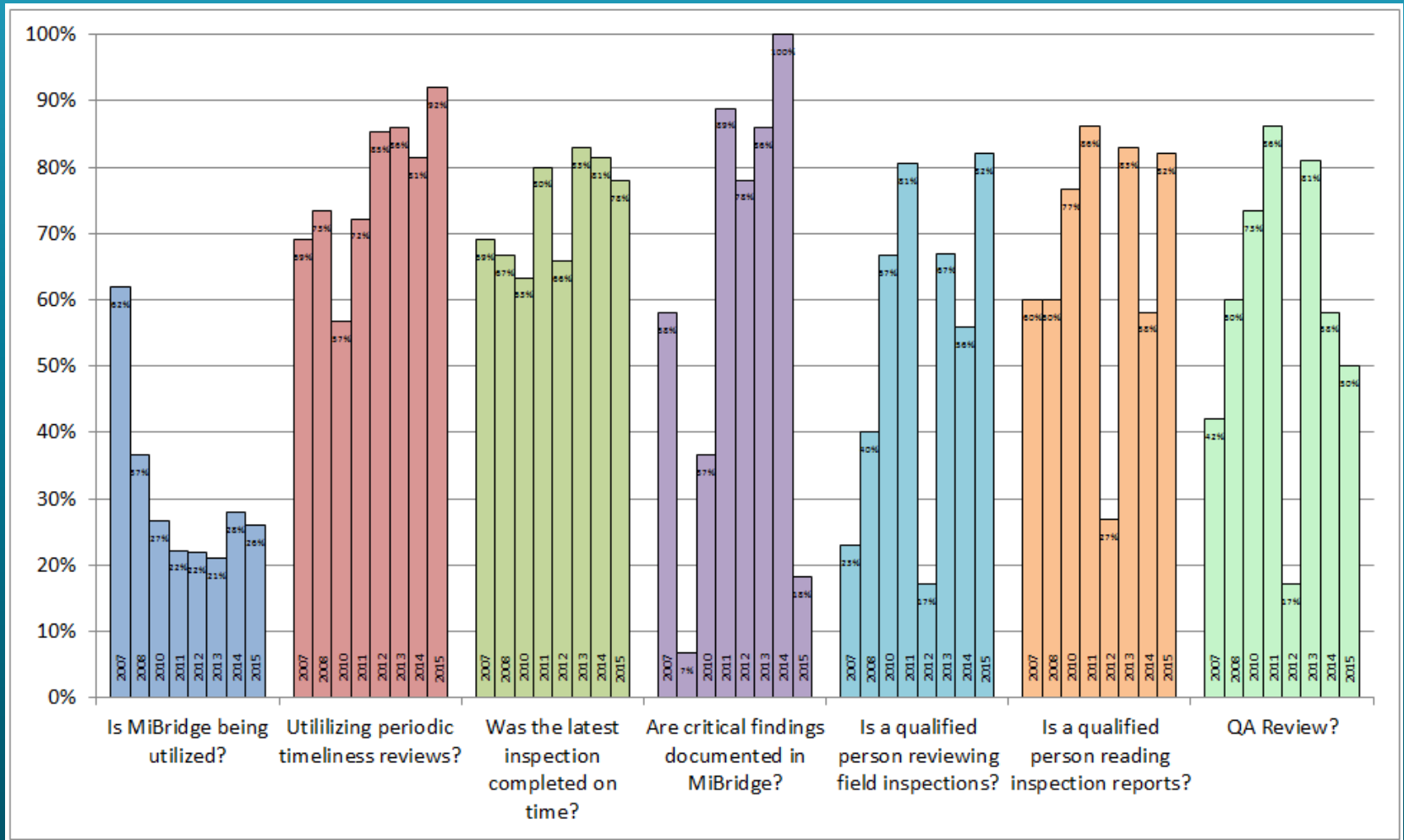
Findings

Quality Control and Personnel Qualifications



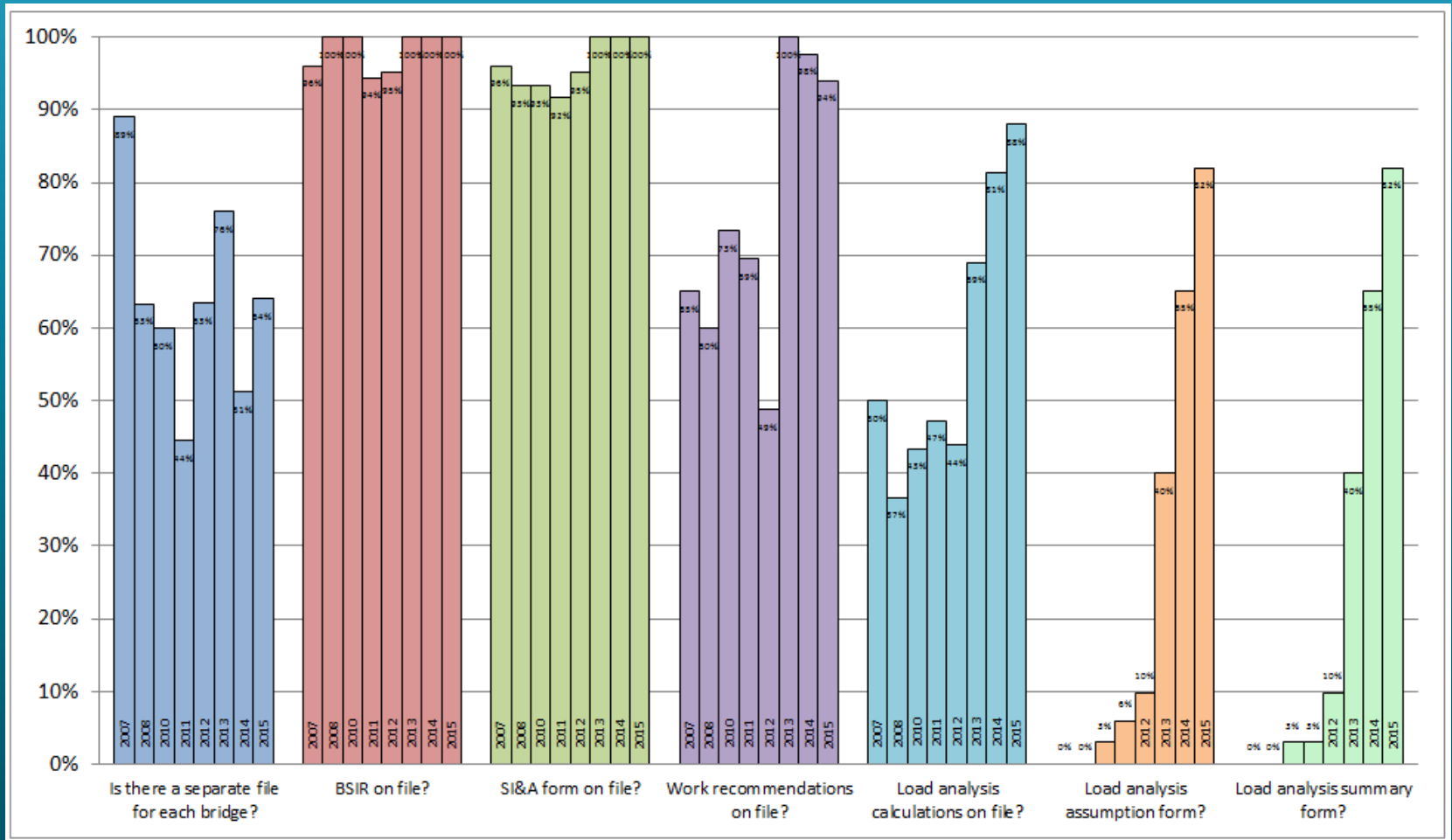
Findings

Quality Control Process



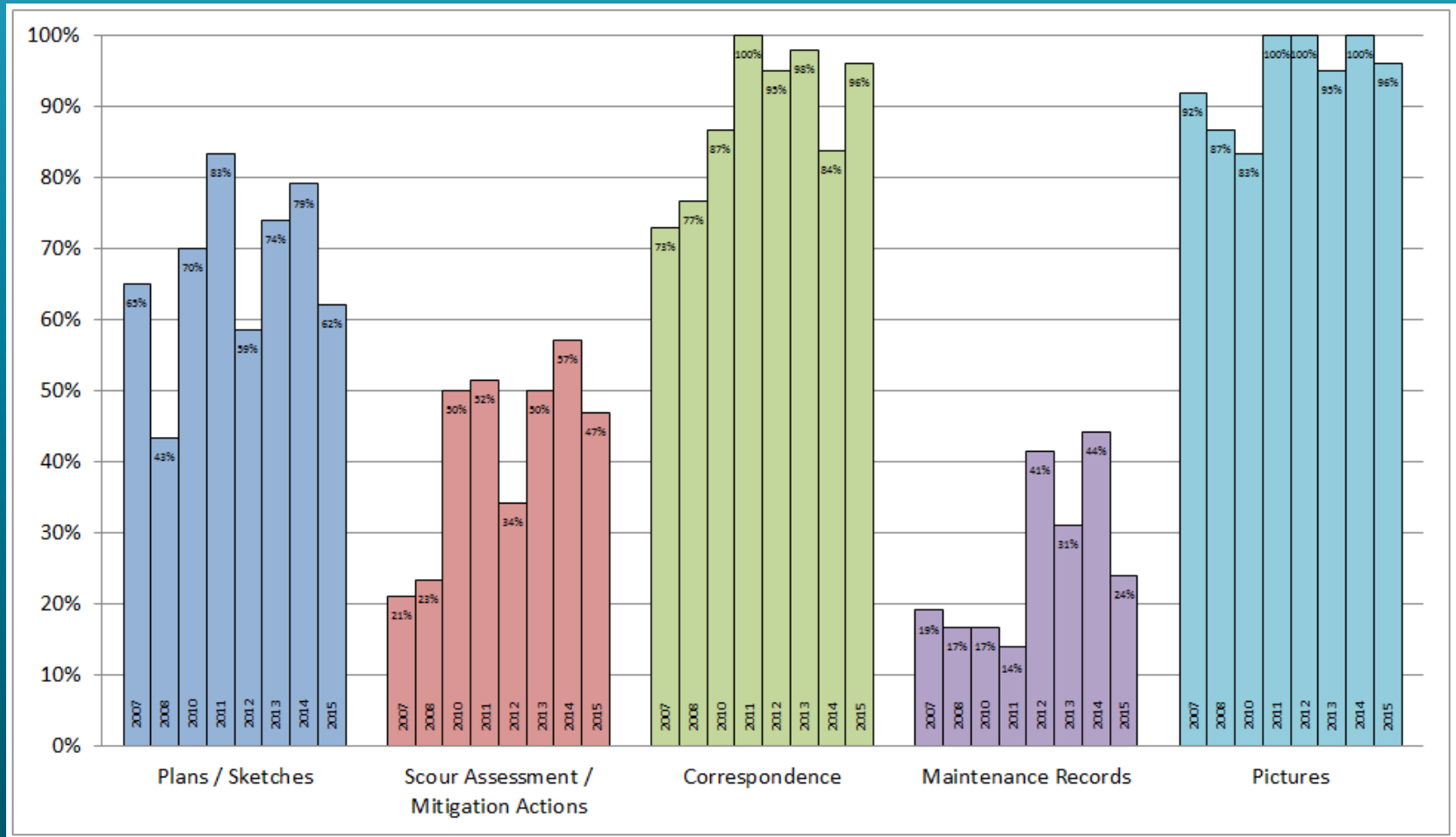
Findings

● Bridge File Components



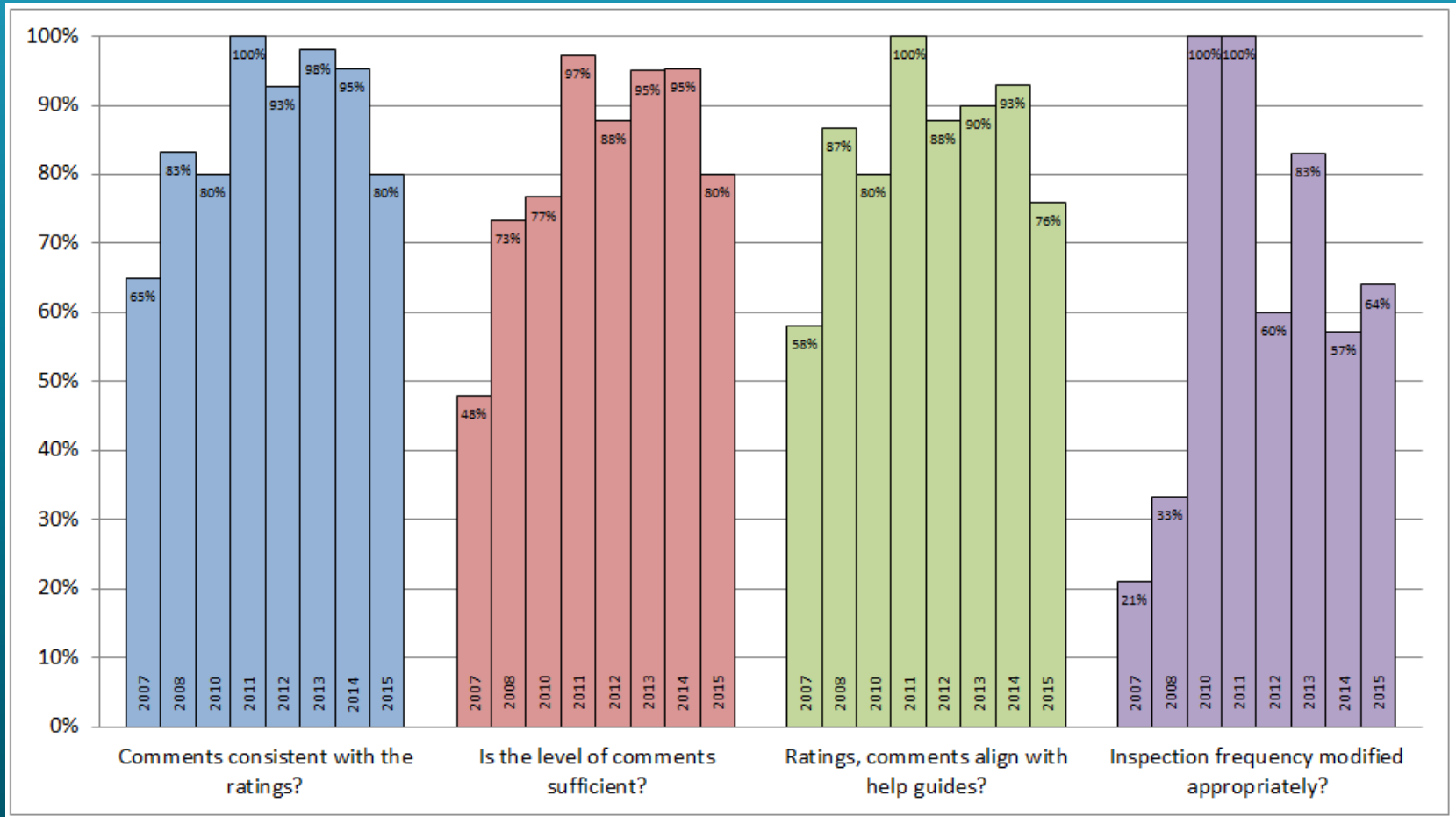
Findings

● Bridge File Components



Findings

● Inspection Consistency with Established Criteria



Trends, 2007-2015



- Upward Trends

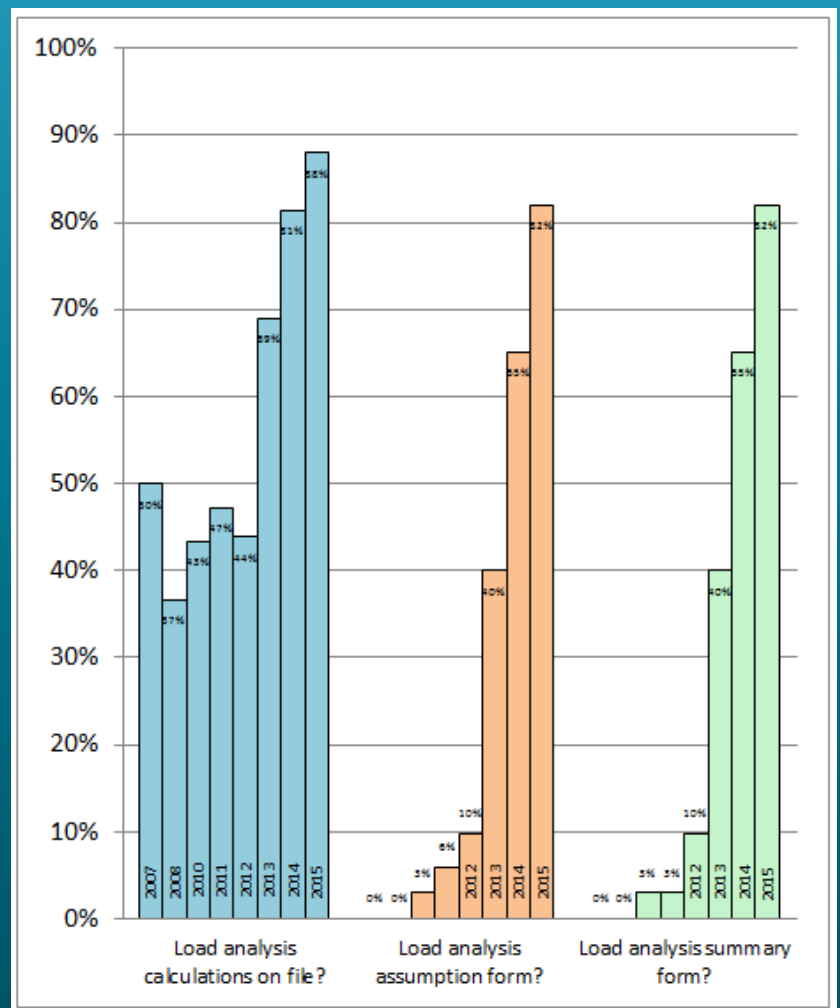
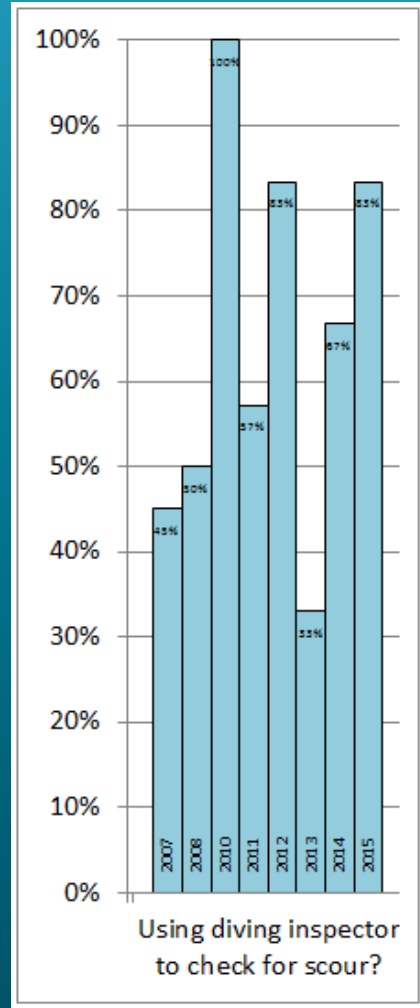
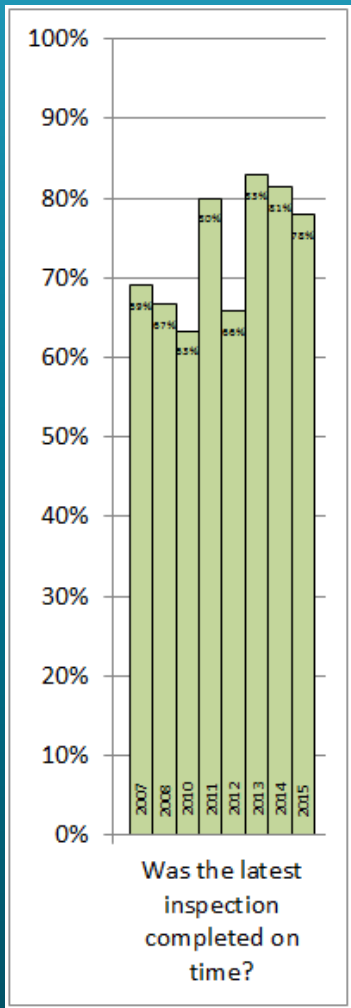
- Inspection timeliness
- Underwater inspections
- Load analysis on file with assumption and summary forms
- Bridge file components
- Inspection report quality

- Not-So-Upward Trends

- Effective QC
- File/field review of inspection reports
- Separate files for each structure

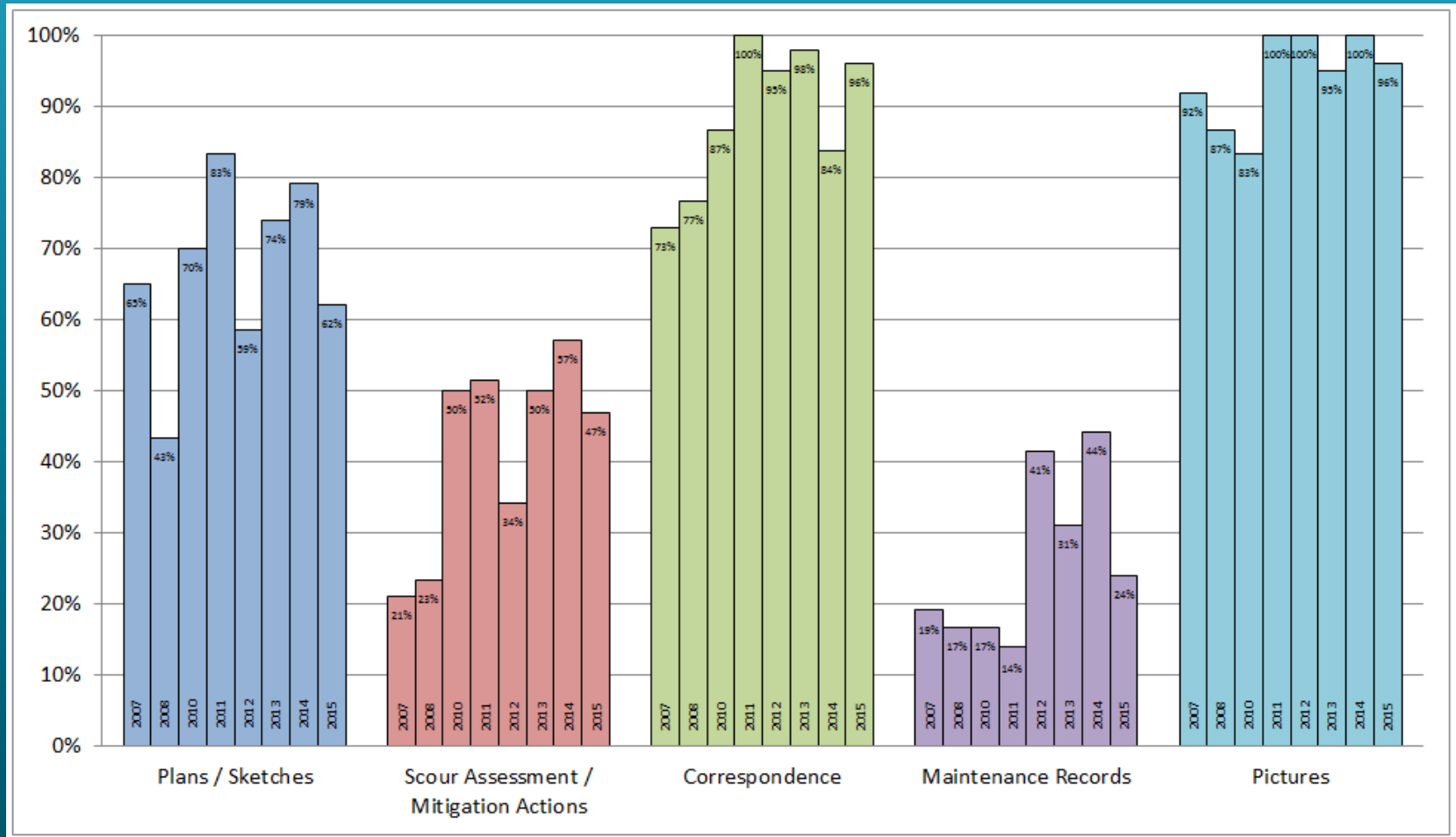
Upward Trends

● Timeliness, underwater inspection, load analysis



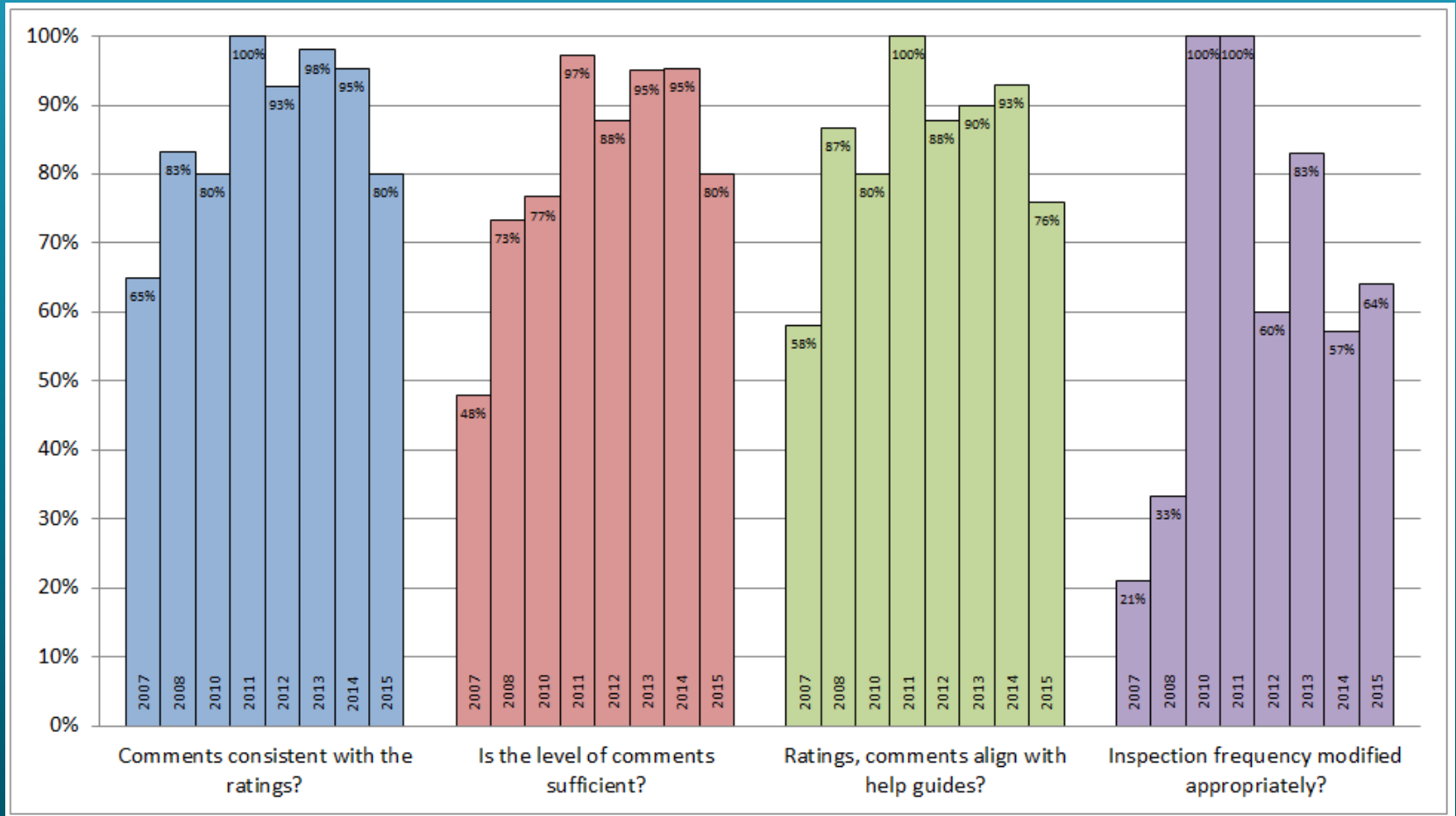
Upward Trends

- Bridge file components



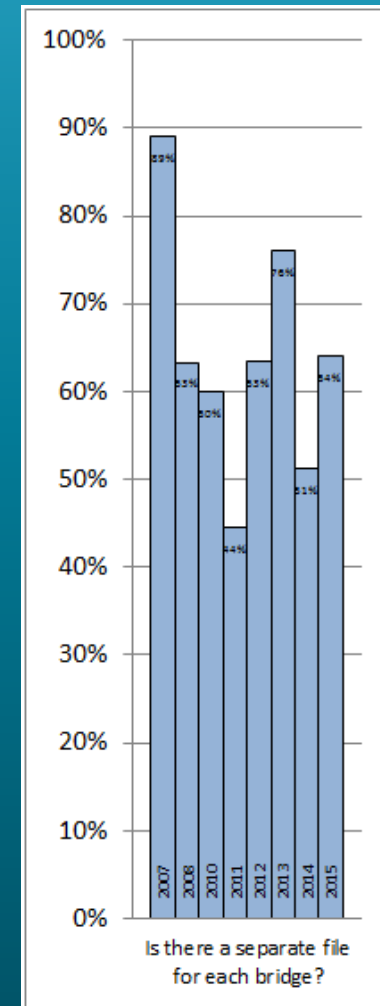
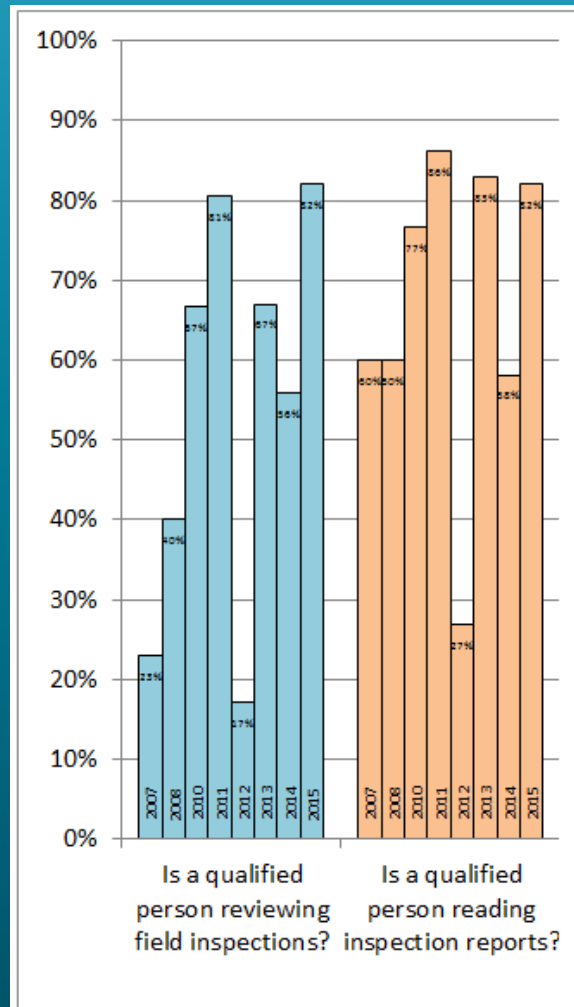
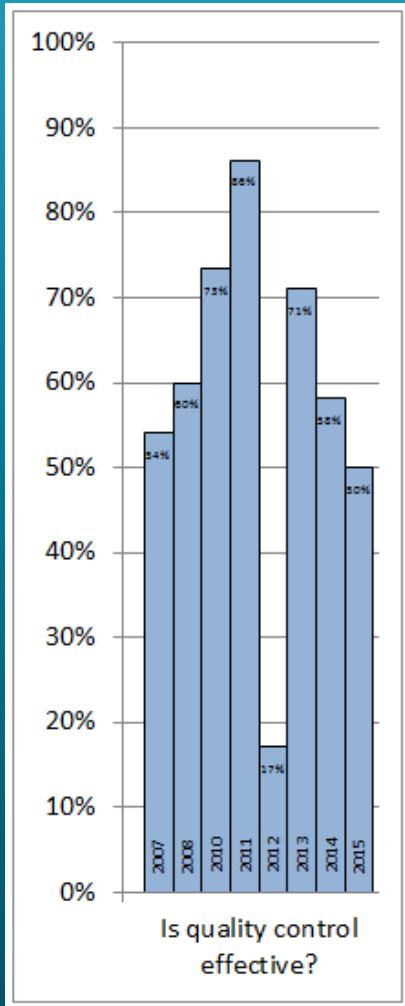
Upward Trends

- Inspection report quality



Not-So-Upward Trends

- Effective QC, file/field review, separate files



The Perfect Review

● File Review (Owner)

- Quality control plan
- Inspector credentials
- Documentation of file and field QC (see next slide)
- Separate file for each structure
- Current inspection report
- Load analysis with assumption and summary forms
- Scour assessment
- Plans, correspondence, maintenance records, photos

● Field Review (Inspector)

- Ratings in alignment with MDOT NBI Rating Guidelines
- Comments consistent with ratings
- Level of comments increase as ratings decrease
- Inspection frequency modified appropriately
- Report Critical Findings with RFA's
- Request Detailed Inspection, Load Ratings, Underwater Inspections as needed

*Refer to Michigan Structure Inspection Manual (MiSIM) Chapter 2 "Quality Assurance and Quality Control"

Tracking QC

- Create method to track quality control activities
 - Ensure revisions are made based on QC checks
 - Provide to bridge owner for files

**Bridge Safety Inspection Report Status Management
Quality Control**

Project No: 1011-2-206 Project Description: City of Lansing Bridge Safety Inspection
 QC Reviewer: *AMY L. TRATHKY, PE, QTL*
 QC Reviewer Signature: *AMY L. TRATHKY*
 Date: _____

Bridge Number	Inspection Reports	Photo's Reviewed	Work Recs Reviewed	QC Review		Revisions		Backcheck		Release to		Field Review			
				By	Date	By	Date	By	Date	Client	PDF	Date Spnt	By	Date	Pass/Fail
2440 - E. GRAND BRIDGE	✓	✓	✓	ALT	11/15/15	ECC	11/17/15	ECC	11/17/15	11/17/15	✓	11/17/15			
2441 - N. MILK	✓	✓	✓	ALT	11/15/15	ECC	11/17/15	ECC	11/17/15	11/17/15	✓	11/17/15	ALT	10.30.15	PASS

Page 1 of 1

Recommendations

- Refer to Michigan Structure Inspection Manual (MiSIM) Chapter 2 “Quality Assurance and Quality Control”
- Owner
 - Have inspector’s quality control plan and credentials on file. Need credentials for everyone associated with inspection. Document all QC activity!
 - Maintain separate file for each bridge that contains all relevant data
 - Perform random QA checks to ensure files are accurate and complete
- Inspector
 - Create method to track quality control activities and provide documentation for owner
 - Perform 5% file and 2.5% field reviews annually for each inspector
 - Complete continuing education to maintain QTL status (24 hours every 5 years)

Questions and Discussion

