National Bridge Inspection Standards & Bridge Maintenance Program Review Geauga County May 2, 2018

By: Mark Stockman, PE, PS
CEAO Federal Bridge QA/QC Engineer

IN ATTENDANCE:

Andy Haupt, PE 70223, PS 8108
Al Prescott
Ben Shrock
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SCOPE OF REVIEW:

The review consisted of interviews with Geauga County personnel, reviews of inspection and inventory data, and reviews of Geauga County bridge records. The office evaluation assessed Geauga County's organization, procedures, resources, and documentation regarding the inspection, inventory, and maintenance operations for bridges. In addition, field reviews of six bridges were conducted to determine if ratings were consistent with the ODOT Coding Manual and FHWA Recording and Coding Guide and to determine if inventory items were coded correctly. The bridges were selected by Geauga County to represent a variety of structure types and conditions. The bridges checked during the field review were:

SFN	CTY-RTE-SECT	TYPE	YEAR BUILT /REHAB	OVERALL LENGTH	County RATING	Suggested NBIS RATING
2830396	GEA C0016 06.490	231	1964	46'	7A	6A
2830493	GEA C0607 01.250	121	1930	56'	6A	same
2830868	GEA C0012 03.590	395	1957	27'	6A	same
2831929	GEA C0005 02.980	155	1927	33'	5A	same
2832445	GEA T0191 00.480	321	1986	13'	4A	same
2832038	GEA T0234 00.560	111	1941	18'	6A	same

FINDINGS AND COMMENTS:

General

Ohio State statutes establish requirements governing the safety inspection of all bridges within the State borders. ODOT with participation of FHWA has developed the ODOT publication Bridge Inspection Manual, hereafter referred to as the Manual, which establishes guidance and requirements regarding bridge inspections within the State. FHWA has determined that ODOT guidance meets or exceeds the FHWA NBIS requirements.

The federal regulations for administering the NBIS are located in the Code of Federal Regulations 23 Highways – Part 650 Subpart C - National Bridge Inspection Standards. The regulations can be found at the following web site:
http://wwwcf.fhwa.dot.gov/legsregs/directives/fapg/cfr0650c.htm

Ohio currently rates bridge element conditions with a 1-4 scale. Summary items conform to the definitions and rating scales established by the NBIS. The NBIS do not require element level condition rating for County bridges unless they are on the expanded National Highway System (NHS) beginning October 1, 2014. Geauga County has 0 bridges on the expanded NHS.

Geauga County has inspection responsibilities for 195 bridges, 97 of which are longer than 20 feet in length and 98 which are 10 feet to 20 feet long. The NBIS inspection and load rating requirements only pertain to highway bridges in excess of 20' long on public roads. Review of the inventory span lengths showed all bridges had the NBIS designation Y/N coded correctly.

The office review and the field review demonstrated that County personnel were inspecting and coding bridges in accordance with ODOT's Bridge Inspection Manual ("Manual"). There were some minor issues in regards to complete compliance with the National Bridge Inspection Standards (NBIS). Comments are listed below.

Inspection Procedures

Geauga County uses their own staff to do the bridge inspections. The inspector brings last year's inspection to the bridge on paper and changes are put into the SMS in the office. Pictures are taken every year. Previous years notes are checked and additional notes are added on old reports in the field. The county was reminded that ratings of 5 and below require complete comments describing Location, Extent, and Severity (LES), including pictures and/or sketches.

A review of the BMS inspection records indicated that an average of 8-10 inspections per day were completed in 2017. The inspections include some smaller bridges between 10'-20' as well as NBIS length bridges.

The County has 1 bridge that are required to use a snooper for inspection. It is used on 1 bridge every 5 years. The inspector uses photographs to document deficient bridge conditions, and photographs are available for every bridge.

Frequency of Inspections

Ohio State Transportation Laws require all State and local bridges to be inspected annually. The SMS showed Geauga County had all bridges inspected in 2017. The NBIS maximum inspection frequency of two years is met. All Bridges over 10 feet in length are inspected annually.

Qualification and Duties of Personnel

Mr. Andrew Haupt is the Program Manager, Load Rating Engineer and Reviewer. He is a PE and has 21 years inspection experience. He took the ODOT Comprehensive Bridge Inspection

courses in 1997. He was the ODOT District 12 Assistant Bridge Engineer from 2009-2013. He was the ODOT District 4 Project Engineer, Construction from 2004-2009. He took an ODOT Bridge Inventory coding class in 2011 and he took a FHWA Load Rating Webinar in 2016. He is qualified as Reviewer and as a Program Manager.

Mr. Al Prescott is a Team Leader. He has 27 years bridge inspection experience. He took the Bridge Inspection Level 1 in 1991 and Bridge Inspection Level 2 in 1999. He took the SMS training in 2013. He is qualified to be a Team Leader.

Ben Shrock is a Team Leader. He has his Associates Degree in Civil Engineering and has construction experience as well as being a County Employee for 8 years. He has been a Bridge Inspection Team Member for 5 years. He completed his Bridge Inspection Training in 2014 as well as his Bridge Element Level Training in 2017. He is qualified to be a Team Leader.

Rick Weikert is a Team Member. He has road construction knowledge.

Andy Haupt, PE #70223 did the load ratings. He is qualified to do load ratings.

Inspection Reports

As part of this review, six bridges were field reviewed to compare conditions with the most recent inspection report. The individual condition ratings for all six bridges properly reflected the field conditions within the tolerance of 1 rating value when compared to the Manual. Summary ratings correspond with the NBIS inspection items. All discrepancies were discussed at the bridge site.

Inventory Items

During the Office Review, no inventory problems were found.

During the Field Review, the CEAO QA/QC Engineer checked select inventory items and no issues were found:

Files

Geauga County keeps all bridge related documents in folders kept in filing cabinets except for load ratings. Those are kept in a separate binder. Currently the Engineer's Office is working on scanning all bridge documents into computers and archiving the hard copies. The bridges are listed by SFN and have subfolders for inspection, maintenance, photos, plans, and design. Since 2013 inspection reports have been kept in SMS.

Load Rating
The inventory shows 89 (100.0%) of the County bridges have been Load Rated or Load Rating was not applicable. 0 were evaluated by documented engineering judgement. The county already had a BR-100 for some bridges and will be creating BR-100 forms for the remaining bridges. The County was also reminded that any bridges with the General Appraisal moving from a 5 to 4 triggers a new load rating.

Load Ratings were checked for SFN 2832860, 2831104, 2830655, 2832542. The load posting at the bridge matched the load ratings for all 4 bridges. PE name and stamp were on all load ratings, and there was documentation for all of them.

Load Posting
Geauga County has 1 bridges that are load posted. This is determined by analysis and engineering judgment. 0 bridges are closed for condition ratings. Bridges are posted using Gross tonnage signs and the posting is based on Operating Rating.

Special Features
The County has no bridge with special features.

Fracture Critical Bridges
Geauga County has 2 bridges labeled as a fracture critical bridge in the SMS. 2 have gusset plates. FC files and Gusset Plate calculations were checked for SFN 2830515 and 2830752. They included the FCM identification and Inspection Procedure, as well as the unstiffened edge length test, and the Fatigue Prone detail list

Underwater Inspections and Scour
0 bridges need an underwater inspection. 190 structures were coded as Scour Susceptible being all over water (185 County Structures and 5 Geauga Park Structures. They all have a Scour POA on file. There are 0 bridges that are considered scour critical. The county was advised if they had any potential scour issues, a written scour evaluation should be placed in the file.

QA/QC
The QA/QC section of the 2014 Bridge Inspection Manual meets the FHWA requirement. In addition the Team Leaders are rotated on the bridges to provide a fresh viewpoint.

Critical Findings
The county did have a Critical Findings Procedure in place.

Bridge Maintenance

The County does force account bridge work as needed. They use a bridge crew of 4 workers to do bridge work. Work performed on bridges includes deck repairs, patching, sealing, some guardrail repairs. Approximately $30,000 - $50,000 is budgeted for in-house repairs and replacements annually.

The county has a contract construction program that does deck repairs, rail repairs and replacement along with welding repairs. The annual budget for this is $500,000. The County rarely uses federal funds and sometimes uses credit bridge funds when available.

Plans for emergency projects are done in house through the bridge crew. The work is done in-house by the bridge crew also. Repair work is documented by timesheets, in-house inspectors, field notes, and work orders. The following people are empowered to order emergency road closures: County Engineer, Deputy Engineer, Bridge Program Manager, and Emergency Services. It is done by a phone call to proper authorities and personnel, barricades, signs, and other notifications.

CONCLUSIONS AND RECOMMENDATIONS

1. No recommendations are needed.

The chart on the following page is a review of the 23 Metrics used to measure NBIS compliance and the chart represents a **preliminary**, **tentative** assessment of the county's level of compliance. Action steps for compliance are listed at the bottom. The actual assessments of NBIS compliance are made by FHWA, based on documentation, and any final determinations of compliance may differ from this preliminary assessment. The Metric 12 & 22 result on the following page is based on the field review of the six bridges visited during the QAR using the NBIP Field Review Checklist - PY 2013, Minimum Level Review Items.

PRELIMINARY FHWA 23 Metric Matrix

23 metrics used by FHWA to measure NBIS compliance. Actual "score" by FHWA may differ.

Compliance Codes for the following Metrics:

(C)	Compliant
(SC)	Substantially Compliant
(CC)	Conditionally Compliant
(NC)	Not Compliant

Metric	Description	(C)	(SC)	(CC)	(NC)
1	State Bridge Inspection Organization				
2	Program Manager Qualification				
3	Team Leader Qualification				
4	Load Rating Engineer Qualification				
5	UW Bridge Inspection Diver Qualification				
6	Routine Inspection Frequency - Low Risk				
7	Routine Inspection Frequency - High Risk				
8	UW Inspection Frequency - Low Risk				
9	UW Inspection Frequency - High Risk				
10	FC Inspection Frequency				
11	Frequency Criteria				
12	Inspection Quality ** 100%				
13	Load Rating				
14	Posted or Restricted Bridges				
15	Bridge Files				
16	FC Bridges				
17	UW inspection procedures				
18	Scour Critical Bridges				
19	Complex Bridges				
20	QC/QA				
21	Critical Findings				
22	Inventory ** 99%				
23	Updating of Data				

** based on results of Field Review

Metric	Action Needed