National Bridge Inspection Standards & Bridge Maintenance Program Review
Guernsey County
October 15, 2020

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

IN ATTENDANCE:

Paul Sherry
Melinda Chase
Mark Stockman, CEAO Federal Bridge QA/QC Engineer

SCOPE OF REVIEW:

The review consisted of interviews with Guernsey County personnel, reviews of inspection and inventory data, and reviews of Guernsey County bridge records. The office evaluation assessed Guernsey 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 checked during the field review were:

SFN	CTY-RTE-SECT	TYPE	County Rating	Suggested NBIS Rating
3033112	GUE T0838 0016079	Steel Beam	4A	same
3030075	GUE T0383 0048763	Steel Beam	5A	same
3030741	GUE T0073 1414755	Steel Culvert	5A	same
3030784	GUE C0078 0359742	Steel Beam	5P	same
3034402	GUE T8361 0004098	Concrete Slab	4P	same
3030776	GUE C0033 0156665	Pres Box Beam	4A	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.

Guernsey County has inspection responsibilities for 314 bridges, 204 of which are longer than 20 feet in length and 110 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 that 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").

Inspection Procedures

Guernsey County uses a consultant to do the inspections. Previous inspection reports are available at site for review. Bridge inspections are recorded in the Asset Wise collector app. Paper forms are available on site for back up in case technology fails. Bridge comments are recorded in Asset Wise and are brought to the bridge. Bridge plans are not carried to the bridge site for review. Bridge plans are available on file at the Bridge Office. Photos are available for every bridge, and photos are taken of defects during inspection.

The County indicated that an average of 20 inspections per day were completed in 2020. Truss (pony/through/deck) takes 1 hour. It takes 0.5 hours for Beam/Girders. For a slab, it takes about 0.5 hours. For a Culvert, it takes about 0.25 hours.

The County has 0 bridges that require a snooper for inspection.

Frequency of Inspections

Ohio State Transportation Laws require all State and local bridges to be inspected annually. Guernsey County had 315 bridges inspected in 2020. The NBIS maximum inspection frequency of two years is met. All Bridges over 10 feet in length are inspected annually. The Program Manager and County Engineer determines the need for a routine inspection frequency greater than once a year, based on deterioration and loading conditions.

There are not any bridges that require inspections more frequently than one year.

Qualification and Duties of Personnel

Mr. Karl J. Osprich is the Program Manager. He is a PE and has 32 years of inspection related experience. He took the ODOT comprehensive L1&2 in 2011 and L2 again in 2016. His most recent Refresher is in 2020. All certificates are uploaded to Asset Wise and are approved. He is qualified to be a Program Manager.

Mrs. Melinda C. Chase is the Reviewer and Team Leader. She is a PE and has 16 years of inspection related experience. She took the ODOT comprehensive L1 in 2003 and L2 in 2006. Her Grandfather Clause is uploaded to AssetWise. Her most recent Refresher is in 2017. All certificates are uploaded to Asset Wise and approved. She is qualified to be a Team Leader.

Mrs. Samantha D. Greene is a Team Leader. She is a PE and has had 7 years of inspection related experience. She took the ODOT comprehensive L1&2 in 2018. No Refresher is needed yet. All certificates are uploaded to Asset Wise and approved. She is qualified to be a Team Leader.

Mr. Jacob H. Scotese is a Team Member. He is an EIT and has had 2 years of inspection related experience. He took the ODOT comprehensive L1&2 in 2019. Certificates are uploaded to AssetWise.

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.

Comments are missing on some bridges. Some bridges had a scour rating that was lower than the Substructure. The county was reminded that Scour controls Sub and Culvert,

Field Review

GUE-T0838-0016079 (3033112) Steel Beam

Ratings: Good except for Superstructure

Superstructure = 5 - should be a 6 by the Manual, however you are within tolerance

Photos = Good

Channel Photos = Good

Comments:

Comments say top flanges of beams have rust and section loss. How much section loss? LES. No detailed pictures of section loss, only overall photos.

Abutment comments call out sheet pile leaning, How much? Need size of hole in sheet piling. Need description and photo of scour hole

GUE-T0383-0048763_(3030075) Steel Beam

Ratings = Good

Photos = Good

Channel Photos = Good

Comments: Comment describes rust flaking but could not find a picture that shows it

How much section loss at beam ends?

Abutments describe differential settlement – where? Was it original and not settling?

Sheet piling has some section loss, how much?

Describe stones condition

GUE-T0073-1414755_(3030741) Steel Culvert

Ratings = Good

Photos = Good

Channel Photos = Good

Comments: Describe section loss in comments , General in the rusted comment, describe location of built up seam.

GUE-C0078-0359742_(3030784) Steel Beam

Ratings = Good

Photos = Good

Channel Photos = Good

Comments:

Describe amount of section loss in the rust comments

Abutment comments need LES

GUE-T8361-0004098_(3034402) Conc Slab

Ratings = Good

Photos = Good

Comments: document size of cracks

Channel Photos = only 1

Add measurements to the crack notes

GUE-C0033-0156665_(3030776) Pres Box Beam

Ratings = Good

Photos = OK

Channel Photos = Good

Comments: LES in opne joints comment of abutment walls

Need picture of spalls on beam edges

Need description of leakage, such as all joints over the complete span, LES

Need size of open joints LES

Inventory Items

During the Files review, it was noted that the Fracture Critical Inspection Procedure needs to mention risk factors that apply to the bridge. See Metric 16.

Files

Guernsey County keeps all information and documents in a cabinet in the road superintendent's office. This includes individual files for each bridge as well as inspection books with required lists and bridge photos.

Load Rating

The inventory shows 204 (100.00%) of the County NBI bridges have been Load Rated or Load Rating was not applicable. There were 6 bridges evaluated by documented engineering judgement.

Load Ratings were checked for SFNs 3033821, 3033880, 3030539. The load posting at the bridge matched the load rating on all bridges. P.E. name and stamp were on all of the bridges. Documentation was on all of the bridges.

Load Posting

Guernsey County has 33 NBIS bridges that are load posted. There are 5 bridges closed for condition ratings. They use a mix of engineering judgement and analysis to determine the load ratings

Special Features

For the bridges with unique or special features, the county inspection binder and bridge files should be referenced.

Fracture Critical Bridges

The FC bridge inspection frequency is yearly. Guernsey County had SFN 3033880 and SFN 7931468 reviewed. They both have FCM's identified and Fatigue Prone details shown. The procedure was partially detailed for both bridges – they need risk factors. The county was advised to refer to Metric 16 and the ODOT Inspection manual appendix D & E.

Underwater Inspections and Scour

There are 0 bridges require underwater inspections. There are 314 bridges over waterways considered scour susceptible and 50 bridges are inspected by probing. There are 0 bridges that are scour critical.

QA/QC

The QA/QC section of the 2014 Bridge Inspection Manual meets the FHWA requirement. The bridge inventory is reviewed regularly in the office for completeness and correctness. Changes to inventory items are noted at the time of inspection. Asset Wise is updated as soon as internet connection is available. Updated inventory data is forwarded to ODOT continuously through the inspection cycle. There are changes discovered during inspection, it is directly entered into their system when internet access is available. Whenever changes are made during new construction or rehab, ODOT and others will be notified when data becomes available from the county.

Critical Findings

The county does have a Critical Findings Procedure in place located in the SMS. Inspectors inform maintenance personnel of routine bridge maintenance problems via written in inspection reports. Inspectors inform Paul Sherry when emergency repairs or critical findings are necessary. If a bridge requires emergency repairs, the county is notified immediately via by telephone. Critical findings are also documented in Asset Wise, via email, and in the inspection binder. The inspectors check proper placement of signs.

Bridge Maintenance

The County does contract bridge work as needed. The work includes full replacements. The approximate budget is $200,000 plus grant funding. Fed Funds are used, but Credit Bridge Funds are not used.

The county does force account bridge work and uses in-house staff that consists of a foreman, 2 workers, and 2 equipment operators as needed. Typical work items include guard rail, deck replacement, and beam replacements. The approximate budget is $200,000.

Maintenance Projects are identified based on annual inspection reports, accident reports, in-house observations, and calls from motorists. Plans are developed for emergency repairs by the engineer and foreman developing a plan onsite to address an emergency. Any structural changes are documented and reviewed by their consultant. County crews does the work of emergency repairs. The work is documented by work record, and on the daily work sheet. The foreman also completes a force account report that summarizes the work done. As far as being empowered to order emergency road closures, a notice is sent to all emergency services, local school, radio and newspaper to announce the closure. Barricades and signage are set by county crews. This can be ordered by the foreman, superintendent, or engineer. In some cases, the sheriff may require it.

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 **				
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 **				
23	Updating of Data				

** based on results of Field Review

Metric 16 – Add Risk Factors to FC Inspection Procedure for each FC Bridge