National Bridge Inspection Standards & Bridge Maintenance Program Review Franklin County October 26, 2020

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IN ATTENDANCE:

David Dibling, Franklin County
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SCOPE OF REVIEW:

The review consisted of interviews with Franklin County personnel, reviews of inspection and inventory data, and reviews of Franklin County bridge records. The office evaluation assessed Franklin 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 Franklin County to represent a variety of structure types and conditions. The bridges checked during the field review were:

SFN	CTY-RTE-SECT	TYPE	County Rating	Suggested NBIS Rating
2530767	FRA C0118 0226	Concrete Slab	5A	same
2533669	FRA T0280 0059	Steel Beam	5A	same
2531143	FRA C0139 0103	Concrete Slab	5A	same
2530147	FRA C0028 0064	Concrete Frame	5A	same
2534231	FRA C0376 0087	Prestr Conc Box Beam	4A	same
2534002	FRA C0222 0539	Prestr Conc Box Beam	5A	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.

Franklin County has inspection responsibilities for 372 bridges, 192 of which are longer than 20 feet in length and 180 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

Franklin County uses their own staff to do the inspections. Previous inspection reports are available at site for review. Bridge inspections are recorded electronically through a tablet and the Asset Wise website. Bridge comments are recorded in Asset Wise and are brought to the bridge. Bridge plans are carried to the bridge site for review. Sharefile is used to access plans remotely and are also in Asset Wise. Bridge plans are available on file at the Bridge Office. Photos are available for every bridge, and photos are taken of defects during inspection.

Inspection comments for NBI bridges are entered in AssetWise where required (rating <= 5).

The County indicated that an average of 5-6 inspections per day were completed in 2020. Truss (pony/through/deck) - NA. It takes 1.5 hours for Beam/Girders. For a slab, it takes about 1.5 hours. For a Culvert, it takes about 0.5 hours.

The County has 52 bridges that require a snooper for inspection. A snooper is used on 49 of those once every 5 years, subject to change if the conditions warrant.

Frequency of Inspections

Ohio State Transportation Laws require all State and local bridges to be inspected annually. Franklin County had 368 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 Team Leaders determine the need for a routine inspection frequency greater than once a year, based on deterioration and type of material.

FRA-SAWY- _(2565285) had an inspection date of 10/2/2019 and therefore was not in compliance with the annual inspection requirement and more than 18 months has elapsed from this inspection.

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

Qualification and Duties of Personnel

Mr. Ed Herrick, Program Manager,. He is a PE and has 20 years of inspection related experience. Comprehensive classes were taken in 2008 are Compliant. Most recent Refresher class was taken in 2017 and is Compliant. All uploaded to Asset Wise and approved.

Mr. David Dibling – Team Leader. He is a PE and has 8 years of inspection related experience. Comprehensive classes were taken in 2013 are Compliant. Most recent Refresher class was taken in 2017 and is Compliant. All uploaded to Asset Wise and approved.

Mr. Matt Balster– Team Leader. He is a PE and has 9 years of inspection related experience. Comprehensive classes were taken in 2011 are Compliant. Most recent Refresher class was taken in 2017 and is Compliant. All uploaded to Asset Wise and approved.

Mr.Joel Moehrman– Team Member. He was hired in May 2020, so has no classes or experience yet.

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.

Field Review

FRA-C0118-0226_(2530767)

Ratings = ... Good

Defect Photos = ...need to update photos in 2021. Photos are 2016-2018.

Channel Photos = ... 2 photos – they are good

Comments= ..... Good except you now have additional spalls on the new slab 2’ wide full length of span, 4 bars exposed. Need LES on stone condition. Stone is ½ gone at SE corner

FRA-T0280-0059_(2533669)

Ratings = ... Good

Defect Photos = ...good

Channel Photos = 2 – North elevation Is the wrong angle

Comments= Good

FRA-C0139-0103 _(2531143)

Ratings = Good

Defect Photos = Good but time to update photos

Channel Photos = West elevation too close – can't see how the stream approaches the structure

Comments= Since Deck = 5, Add comment to Deck to refer to Super for defect comments

FRA-C0028-0064 _(2530147)

Ratings = Good

Defect Photos = GOOD

Channel Photos = photos in channel section are wrong – need to be looking at the bridge.

Comments= Good – add square footage of spalled areas.

FRA-C0376-0087 _(2534231)

Ratings = Good

Defect Photos = Good

Channel Photos = good

Comments= Good

FRA-C0222-0539 (2534002)

Ratings = ... Good

Defect Photos = ... None

Channel Photos = ... East elevation Is the wrong angle

Comments= ..... Good

Inventory Items

The Method of Rating needs to be the same, 4 bridges had a different Method of Rating for Op vs Inv. Method of Rating. 2530001, 2533766, 2530538, 2533901

9 bridges had a % Legal that was not correct. The county has performed EV load ratings but the % Legal was not updated to reflect the lowest rating factor. EV rating factors are to be included when % Legal is determined,

On the Channel Photos for 2531704, 2 photos in the channel section are wrong (they are taken from the bridge looking at the channel), but correct photos are in the inspection photos.

For 2531674, 2532115 and Mann Rd, the channel photos are good.

Files

Franklin County keeps almost all of their files on their network drives in their individual bridge folder. Older inspection reports can be found in the file cabinets.

Load Rating

The inventory shows 192 (100.00%) of the County NBIS bridges have been Load Rated or Load Rating was not applicable. There were 14 bridges evaluated by documented engineering judgement.

Load Ratings were checked for SFNs 2531674, 2531704, 2532115. 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

Franklin County has 1 NBIS bridge that is load posted. There are 0 bridges closed for condition ratings. They use analysis to determine. R12-H5 EV Sign is the type of sign used for load posting.

Special Features

There are 2 bridges with unique or special features – BRO C0150 0000 (Beach Rd) CLI C0059 0318 (Lane Ave)

Fracture Critical Bridges

The FC bridge inspection frequency is 24 months. The FC plan for SFN 6051111 reviewed. FCM's were identified – 4 and 6 cables in each set to provide redundancy. Fatigue Prone details should be stated if they are present or not and listed if they are,

The FC Plan for Beach Road FRA-C0150-0000 - 2535882 was reviewed. The county has a Complex Bridge Inspection Procedure for this bridge.It was noted that the Fracture Critical Inspection Procedure needs to mention risk factors that apply to the bridge. Also, Fatigue Prone details need to be listed. If there are not FP details, make a statement in the FC plan to that effect. (Metric 16)

Underwater Inspections and Scour

There are 3 bridges require underwater inspections – BLE C0020 0273 (Smothers Rd), NOR C0032 0674 (Hayden Run), NOR C0052 0046 (Fishinger). There are 349 bridges over waterways considered scour susceptible and all bridges that don't require underwater inspections are inspected by probing. There is 1 bridge that are scour critical (SFN 2534673).

The UW plan was reviewed for the Smothers Rd Hoover Reservoir bridge. The location of the UW elements was vague, there were no distances to show the locations of the piers.

QA/QC

The QA/QC section of the 2014 Bridge Inspection Manual meets the FHWA requirement. The Inventory items are checked and updated during annual inspections. Inventory is checked annually or when maintenance/construction on the bridge occurs. It is input into the system with Asset Wise with plan/field information. Whenever it changes within Asset Wise, they forward the inventory data to ODOT. Changes are made in the inspection on the tablet and when the report is approved, it is updated in Asset Wise. Changes are made before the new construction or rehab opens to traffic. They are made so the bridge can then be inspected before it opens to traffic.

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 and Excel spreadsheet list. Inspectors inform Ed Herrick when emergency repairs or critical findings are necessary. It is documented by filing a Critical Finding report. If a bridge requires emergency repairs, it is documented in the report and through emails and OneNote. The bridge inspector or mobility department checks proper placement of signs.

Bridge Maintenance

The County does contract bridge work as needed. The work includes bridge replacement/rehab and joint replacements. The approximate budget varies. In 2020 it was $8.4 million, in 2021 it is $6.6 million, and in 2022 it is $10.5 million. Fed Funds and Credit Bridge Funds are both used.

The county does fore account work and has staff that consists of 2 bridge maintenance crews consisting of 2 supervisors and 8 workers. Typical work items include scour repair, culvert invert lining, superstructure replacement, precast deck slabs, deck patching, concrete deck and sidewalk sealing, drift removal, reset bearings, full box replacements (if small enough). The approximate budget is NA.

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	Action Needed
6	perform inspections within the required time frame