National Bridge Inspection Standards & Bridge Maintenance Program Review Seneca County December 15, 2020

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IN ATTENDANCE:

Mark Zimmerman
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SCOPE OF REVIEW:

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

Asset Name	TYPE	County Rating	Suggested NBIS Rating
SEN-C0011-0389 _(7440650)	Conc Slab	5A	same
SEN-T0132-0838 _(7438079)	Steel Beam	5A	same
SEN-T0194-0083 _(7434693)	Steel Beam	5P	same
SEN-C0023-0351 _(7433425)	Pony Truss	5A	same
SEN-T0077-0572 _(7433301)	Conc Tee Beam	5A	same
SEN-C0027-0297 _(7445806)	Prestr 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.

Seneca County has inspection responsibilities for 403 bridges, 214 of which are longer than 20 feet in length and 189 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

Seneca County uses their own staff to do the inspections. Previous inspection reports are available at site for review. The previous year's inspection reports (paper) are brought out and changes are made on that form and electronically. Bridge comments are recorded in the inspection form. Bridge plans are available in the office. Photos are available for every bridge, and photos are taken (if needed) of defects during inspection.

The County indicated that an average of 7 inspections per day were completed in 2020. It takes about 60 minutes for Truss (pony/through/deck). It takes 30 minutes for Beam/Girders. For a slab, it takes about 45 minutes. For a Culvert, it takes about 15 minutes.

The County has 5 bridges that require a snooper for inspection and they are done every 3-5 years.

According to the county, a Team Leader is not present at routine inspections. The county is reminded that a Team Leader is required to be present at all inspections.

Frequency of Inspections

Ohio State Transportation Laws require all State and local bridges to be inspected annually. Seneca County had 214 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 Engineer determines the need for a routine inspection frequency greater than once a year, based on inspections and history.

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

Qualification and Duties of Personnel

Mr. Mark Zimmerman is the County Engineer and Program Manager. He is a PE and has over 20 years of bridge inspection experience. He took ODOT Level 1 bridge training in 2001 and has a Legacy Grandfather Clause checklist to document his experience prior to 2006. He took

a Refresher in 2019 and 2021. The Refresher and Legacy clause are approved and uploaded to AssetWise. He is qualified to be the Program Manager.

Mr. Jason Kirgis is a Team Leader. He has 4 years of inspection related experience. He has an associates degree in Construction Management. He has the comprehensive classes (ODOT Level 1 and Level 2) in 2018 and the ODOT Refresher in 2020. They are all approved and uploaded to AssetWise. He is qualified to be a Team Leader.

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

SEN-C0011-0389 _(7440650) Conc Slab

Deck = 5
Superstructure = 5 84 sf spalling = 13%. Should check for rebar deterioration. If rebar is corroded – rating should be a 4.
Substructure = 6
Channel = 7
Scour = 6
Culvert = N
Photos = shows spalling but not the rebar
Channel Photos = NG can't see the channel under the structure
Comments= NONE Need LES in AssetWise

SEN-T0132-0838 _(7438079) Steel Beam

Deck = 5
Superstructure = 5

Substructure = 5
Channel = 6
Scour = 7
Culvert = N
Photos = NONE Need photos of Deck, Super and Sub
Channel Photos = NG
Comments= need LES in DECK – upload to AssetWise
Mark's comments
DECK – rotting in a 2-3 boards, wet, soft in 2-3 boards, need better LES
SUPER – Weathering Steel, surface rust except fascia stringers – minor sect loss and minor pitting in fascia top flange and top of web. Fascia does not control bridge.

SEN-T0194-0083 _(7434693) Steel Beam

Deck = 6
Superstructure = 5 might be a 6, section loss is minor, not moderate
Substructure = 7
Channel = 8
Scour = 7
Culvert = N
Photos = NONE Need photos of Super
Channel Photos = NG
Comments= NONE Need SUPER comments in AssetWise
Mark's comments : Rust flaking on bottom flange, insignificant section loss

SEN-C0023-0351 _(7433425) Pony Truss

Deck = 6 maybe should be a 5
Superstructure = 5 might be 6 based on overall condition is not that bad
Substructure = 7
Channel = 5 maybe could be a 6? Water was high – couldn't tell. 5 rating = major damage, bank eroded
Scour = 7
Culvert = N
Photos = NONE
Channel Photos = Channel photos Not Good – looking away from bridge.
Comments= Need LES on SUPER if you are keeping it rated a 5. Super and Channel comments are required to be in AssetWise

SEN-T0077-0572 _(7433301) Conc Tee Beam

Deck = 5
Superstructure = 4
Substructure = 5
Channel = 8
Scour = 7
Culvert = N
Photos = Need better photos of DECK, underside would be good – SUB and SUPER photos are Good. Add photo of pier showing leaching and efflo
Channel Photos = NG
Comments= need LES on DECK, SUPER and SUB and they need to be in AssetWise

SEN-C0027-0297 _(7445806) Prestr Box Beam

Deck = 6
Superstructure = 5 - might be a 4, Need original strand count to be sure – all joints leaking 100% of span, cracks in all beams at ends, strands exposed on fascia beams
Substructure = 7 - might be a 6 – a lot of moisture and efflo
Channel = 8
Scour = 7
Culvert = N
Photos = SUB = Good, SUPER = NONE need photos of super defects
Channel Photos = NG
Comments= Comments with LES for Superstr are required in AssetWise

Inventory Items

Review of the bridge data showed 34 out of 212 bridges had no comments when the rating was <=5, and review of the 6 bridges in the field showed all comments were missing sufficient detail with LES described in AssetWise when the rating was 5 or lower. This requirement became effective Nov of 2020.

Files
Seneca County keeps files as follows:

- ALL BRIDGE FILES ARE KEPT IN DEDICATED BRIDGE FILING CABINETS IN COUNTY ENGINEER'S OFFICE SOME OLD BRIDGE PLANS ARE KEPT IN BACKROOM OF THE COUNTY ENGINEER'S OFFICE

Load Rating
The inventory shows 214 (100.00%) of the County NBIS bridges have been Load Rated or Load Rating was not applicable. There was 1 NBIS bridges evaluated by documented engineering judgement.

Load Ratings were checked for SFNs 7437730, 7433433, 7437722 and 7437749. 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
Seneca County has 16 NBIS bridges that are load posted. There are 2 bridges closed for condition ratings. Posting is based on Operating Rating. SHV R12-H5 signs are the type of sign used for load posting.

Special Features
There are 0 bridges with unique or special features.

Fracture Critical Bridges
The FC bridge inspection frequency is 12 months, done with routine annual inspections. FC plans for SFN CR48-1.07 and TR 58-2.98 were reviewed. They both had FCM's identified and Fatigue Prone details, but the FC Inspection Procedure will not meet FHWA approval. The county is aware of this and is working on it. Use Inspection Manual **Appendix D & E** as guidelines to a complete FC plan.

Gusset Plate calculations were satisfactory for TR58-2.98.

Underwater Inspections and Scour
Seneca county does not have any bridges that require dive inspections.

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.

Critical Findings
The county does have a Critical Findings Procedure in place (using the ODOT inspection manual). The Bridge Foreman handles emergency repairs.

Bridge Maintenance

The County rarely does contract bridge work.

The county does force account bridge maintenance work and uses highway maintenance crews as needed. Typical work items include all maintenance items. The approximate budget is $100,000.

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
12	supply comments when rating<6, comments need to be detailed with LES
14	Op and Inv RF need to be in tons or bridge needs to be closed
16	Supply FC Insp Procedure and FPD for each FC bridge