Quality Assurance Review

National Bridge Inspection Standards &
Bridge Maintenance Program

Logan County

August 4, 2022

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

The scope of this review is to evaluate the agency's bridge inspection program based upon The Ohio Revised Code, the ODOT Manual of Bridge Inspection (MBI), and the National Bridge Inspection Standards (NBIS). This includes the following checklist, interviews with staff members responsible for the inspection program, review of files and documentation, and field inspection of bridges. Note: the inspection program includes inventory, maintenance and load rating in addition to the field inspections.

Instructions for completing form: Please fill out checklist prior to scheduled review.
Brief answers are desired; fill the items out to the best of your ability.

Agency: LOGAN COUNTY ENGINEER'S OFFICE

DATE: 8/4/2022

Questionnaire Completed by: MICHAEL J. KERNS, P.E.

I. MAINTENANCE, REHABILITATION AND REPLACEMENT PROGRAM

A. NUMBER OF BRIDGES WITH MAINTENANCE RESPONSIBILITY

1. Greater than 20' long (NBIS length 23CFR 650c) **(Metric 22)** 192

2. Bridges >= 10' and <= 20' long **(Metric 22)** 96

B. PROCEDURES AND BUDGET

1. Contract repairs and replacement per year

Replacements:(Enter Number): Culverts : 0 Bridges: 0

Rehabilitations (Enter Number): Culverts : 0 Bridges: 0

Replacements (Enter Number): Culverts : Bridges:

-List approximate annual budget: $200,000 for bridge (typically for a superstructure and related superstructure material)

Are Credit Bridge funds used? No
Are Fed Funds used? Sometime (most recently for a new bridge built in FY 2020)

2. In-house repairs and replacements

Replacements:(Enter Number): Culverts : 10 Bridges: 1

Rehabilitations (Enter Number): Culverts : 2 Bridges: 10

Replacements (Enter Number): Culverts : Bridges:

List approximate annual budget: $610,000 from Motor Vehicle Fuel Tax fees and an additional $50,000 to $250,000 from Sales Tax for Roads and Bridges

3. How are projects identified and selected? Check all that apply.

- [X] Inspection reports.
- [X] Sufficiency rating.
- [X] Growth/development.
- [ ] Other…explain Click or tap here to enter text.

4. How are plans developed for emergency repairs? Check all that apply.

- [X] In-house
- [ ] Consultant
- [ ] Contractor
- [ ] Other explain Click or tap here to enter text.

5. Who does the work of emergency repairs? Check all that apply.

- [X] In house
- [ ] Contractor
- [ ] Other explain Click or tap here to enter text.

6. How is repair work documented? (i.e. work record, time card, plans?)

- [X] Work orders
- [ ] Time Cards
- [X] Plans

Note: Repair work is also documented with crew worksheets and PEOMS software. Plans are prepared for major repair projects.

7. Who is empowered to order emergency road closures and how is it done?

- X Engineer?
- ☐ Sherriff?
- ☐ Commissioners?

Note: Primarily it's the Logan County Engineer who orders emergency road closures but the responding on-call supervisor will also order an emergency road closure when necessary. The emergency situation will be inspected and the Sheriff's Office will be notified and proper signage will be placed.

II. INSPECTION PROGRAM

A. NUMBER OF BRIDGES WITH INSPECTION RESPONSIBILITY

1. Greater than 20' long (NBIS length, ORC 5501.47, 5543.20) **(Metric 22)** 198

2. Between 10' and 20' long (ORC 5501.47, 5543.20) **(Metric 22)** 96

B. STAFFING

1. Name of individual who is the **Program Manager** (makes FINAL DECISION). List qualifications/yrs. experience (bridge inspection experience) **(Metric 1&2)**

Name: Scott C. Coleman, P.E., P.S., Logan County Engineer

- Yrs. Inspection related experience: 28

- List courses attended (& approx. dates) Ohio DOT Bridge Inspection Level 1 (INSERT MONTH/YEAR), Ohio DOT Level 2 (INSERT MONTH/YEAR)

Inspection Courses for Compliance	Ohio DOT Refresher (In-Person 1-day)	No	11/09/2015	11/09/2020
Other	Legacy Clause Checklist (TL or PM work before January 13, 2005)	Yes	02/26/2021	02/26/2021
PE License	Professional Engineering License (Ohio)	Yes	01/01/2022	12/31/2023
Other	Legacy Clause Checklist (TL or PM work before January 13, 2005)	Yes	02/18/2021	12/31/2021
Inspection Courses for Compliance	Ohio DOT Refresher (In-Person 1-day)	Yes	01/14/2020	01/14/2025
Inspection Courses for Compliance	Ohio DOT Level 1 - Basic (3-day) 1997-2020	Yes	03/28/1995	

2. Name of individual in charge of bridge inspection unit (**Reviewer**). List qualifications/yrs. experience (bridge inspection experience) **(Metric 1)**

Name: Michael J. Kerns, P.E., Assistant Engineer

- Yrs. Inspection related experience: Nine years of bridge inspection and bridge inventory experience

- List courses attended (& approx. dates) Ohio DOT Bridge Inspection Level 1 (November 2013), Ohio DOT Bridge Inspection Level 2 (December 2013), Ohio DOT Bridge Inspection Level 1 (November 2013), Ohio DOT Bridge Inspection Level 2 (December 2013), Ohio DOT AASHTOWARE BrR Training (2-day training, fall 2018), Ohio DOT Refresher (1-day refresher in January 2020)

3. **Team Leader** - individual in charge of bridge inspection team (INSPECTED BY). List qualifications/yrs. experience (bridge inspection experience) **(Metric 1&3)**

Name: Steve Tracey

- Yrs. Inspection related experience: Eight years of bridge inspection experience and eight years of bridge construction experience

- List courses attended (& approx. dates) Ohio DOT Bridge Inspection Level 1 (September 2014), Ohio DOT Bridge Inspection Level 2 (October 2014), Ohio DOT Refresher (1-day refresher in January 2020)

C. Indicate the percentage of time spent on the listed duties in the previous year

%TIME on inspections:

100% Bridge/Culvert inspection

___% Bridge Design/Plan prep

___% Bridge Construction

___% Bridge Maintenance

___% Overload/Superloads

___% Surveying

___% Other -

___% 100% on Bridges only

4. **Load Rating Engineer** – Name of individual responsible for load ratings (must be PE) **(Metric 4)**

a. List Ohio PE # 63397 b. Name: Scott C. Coleman, P.E., P.S.

Note: Michael Kerns (PE # 84412) also performs load ratings

5. **Underwater Bridge Inspection Diver** – Name person doing dive inspections **(Metric 5)** **N/A**

- Name: Click or tap here to enter text.

- Yrs. Inspection related experience: Click or tap here to enter text.

- List courses attended (& approx dates) Click or tap here to enter text.

D. INSPECTION EQUIPMENT

1. Type of vehicle used for inspections

- [X] Pickup truck
- [ ] Van
- [ ] SUV
- [ ] Custom vehicle

2. What typical inspection equipment does the inspection team normally carry with them to the inspection site? Check all that apply.

- [X] Extension Ladder Length 20'
- [X] 100' Fiberglass Tape
- [X] Geologist Hammer
- [ ] Inspection Mirror
- [X] Flashlight
- [ ] Thermometer
- [ ] Plumb Bob
- [X] Camera
- [X] 2'-0" Level
- [ ] Brush Hook/Axe
- [X] Boat
- [X] First Aid Kit
- [ ] Wire Brush
- [ ] 6' Folding Rule
- [X] Scraper
- [X] Vertical Clearance Rod
- [X] Probing Rod
- [X] Paint Stick/Crayon
- [X] Hip Boots and Waders
- [ ] Sounding Chains
- [X] Wrenches
- [X] Pliers
- [X] Screw Driver
- [X] Shovel
- [ ] Calipers

Other equipment not listed above: 30' tape

3. List types of NDT methods used? Circle all that apply.

☐ Dye penetrant; ☐ Magnetic particle; ☐ Ultrasound;

Other: Sounding and chain drag

5. What equipment does your team have available for "hands on" access to <u>FCM</u> bridge members? (Metric 16)

Most of the FCM bridge members are accessible with an extension ladder but we also use a retro-fitted snooper when necessary.

6. Use of equipment (Metric 16)

a. How many bridges need a snooper? 1

b. How many bridges is it used on? 1

c. How often? Historically 4 times a year but not as often now since the bridge in question (SFN 4631838) is closed.

E. INSPECTION PROCEDURES

1. Approximately how many inspections were made during last calendar year? (Metric 6)

294

2. Approximately how many inspections are scheduled for the current calendar year? (Metric 6)

294

Note: This year our department started a bridge inspection schedule based upon the guidelines set forth in the Reliability Based Inspection Implementation Procedure effective July 2021. In addition to following the guidelines set forth in the RBI Procedure, we also visit each bridge every year and perform what we call a "Maintenance Inspection" on those bridges that are not due for a Routine or Fracture Critical Inspection. Our department has decided it makes the most sense to do the inspections required per the Reliability Based Inspection method on an alternating schedule, alternating every year between odd-numbered and even-numbered townships.

3. Average number of inspections per day (Metric 6) 6

4. Approximately how long (hours) does it take to inspect average sized structures
The Logan County Engineer's Office time to input inspections and time to review and approve inspections has doubled to approximately 72 hours per year due to Assetwise being slow, clunky, and inefficient. Assetwise needs to be fixed considering the extreme cost that ODOT has paid for this software. It's functioning is unacceptable!

a. Beam/Girder: Simple Span: 1 hrs. Multi-span: 1.25 hrs.

b. Slab bridge: Simple Span: 0.75 hrs. Multi-span: 1.25 hrs.

c. Truss (pony): Simple Span: 1 hrs. Multi-span: 1.25 hrs.

d. Through/deck: Simple Span: 1 hrs. Multi-span: 1.25 hrs.

e. Culvert: Single cell 0.5 hrs. Multiple Cells: 0.75 hrs.

5. Are previous inspection reports available at site for review? (Metric 15) Yes ☒ No ☐

6. Are bridge inspections recorded in field on ☒ Paper ☐ Electronically

7. Are photos available for every bridge? Yes ☐ No ☒ **(If no, you need to start.)**

8. Are photos posted in Assetwise? Yes ☒ No ☐ **(If no, you need to start, and be selective.)**
Yes, for bridges that have a General Appraisal less than 6

9. Are defects photos taken during inspection? Yes ☒ No ☐ **(If no, you need to start.)**

10. Are Bridge comments recorded in Assetwise? Yes ☒ No ☐ **(If no, you need to start.)**

11. Are previous bridge comments brought to the bridge? Yes ☒ No ☐ **(If no, why not)**

12. Are the bridge plans carried to the bridge site for review? (Metric 15). Yes ☐ No ☒

13. Are bridge records available for review in the bridge office? (Metric 15) Yes ☒ No ☐

7. Who determines the need for a routine inspection frequency greater than once Annually, and what criteria is used? (Metric 6)

Explain: **Scott Coleman. Criteria used includes the condition of the bridge, the load rating, and the results of an inspection.**

8. Do you have bridges requiring insp. more frequently than 12 MO Yes ☐ No ☒

____ Number due to **Damage** Choose an item. List frequency of inspection. **(Metric 11)**___

____ Number needing **In-depth** Choose an item. List frequency of inspection. **(Metric 11)**_____

____ Number of **Special insp** Choose an item. List frequency of inspection. **(Metric 11)**

9. Does your inspection team believe it has enough time to do the job?

Yes ☒ No ☐

10. List your quality assurance checks made during the inspection process? (Metric 20)

After field reviews are performed (primarily by Steve Tracey, Mark Hilty and Elliott Fullerton), the inspections are reviewed by Michael Kerns and then sent to Scott Coleman for a final review.
When major issues arise, the inspection team notifies Michael Kerns and/or Scott Coleman immediately.

11. Do you have any bridges that need underwater inspections in less than 60-month intervals? (Metric 8)

Yes ☐ No X (Assetwise check)

12. Do any bridges have fracture critical inspections performed more frequently than 24-month intervals? (Metric 10)

Yes ☐ No X (Assetwise check)

Not currently; we used to inspect SFN 4631838 every 3 months but it is now closed.

13. Is a Team Leader at the bridge at all times during the following inspections? (Metric 12)

Initial Inspection? Yes X No ☐

Routine Annual Inspections? Yes X No ☐

Special Inspections? Yes ☐ No ☐ **N/A**

Underwater Inspections? Yes ☐ No ☐ **N/A**

Fracture Critical Inspections? Yes X No ☐

F. SCOUR CRITICAL BRIDGES (Guidance in ODOT Manual of Bridge Inspection)

1. No. of bridges considered scour susceptible? (Service over Water) 285

2. Number of bridges inspected by probing? 0

3. Number of Scour Critical bridges (item 113 - 3, 2, 1 or 0)? (Metric 18) 2 (SFNs 4631153 & 4630963)

4. Are Plans of Action (POA) complete and implemented for all bridges coded "Scour Critical"? (Metric 18) Yes X No ☐ If no, Why? Click or tap here to enter text.

5. How many structures are coded 6 on item 113 Scour Critical? (Metric 18) 0

6. **How are scour evaluations performed?** (Metric 18)

After a site inspection to inspect the structure's foundation, water velocity, and channel characteristics, the site's history is also evaluated. Channel measurements and channel photos are taken as required and a Scour Critical Plan of Action is maintained. The Scour Critical Plan of Action, channel photos, and the channel measurements are stored electronically and uploaded into Assetwise.

7. Who determines the need for diving inspections and by what criteria?

N/A

G. INVENTORY

1. What kinds of inventory quality assurance checks are performed? (Metric 22)

After field reviews are performed (primarily by Steve Tracey, Mark Hilty and Elliott Fullerton), the inspections are reviewed by Michael Kerns and then sent to Scott Coleman for a final review.

How Often?... X With every inspection ☐ Less often than once per year

2. How often is the inventory checked for needed updates? (Metric 22)

How Often?... ☐ With every inspection ☐ Less often than once per year

Typically inventory is done on as-needed basis within 180-days of an inventory change.

3. How is the inventory data input into Assetwise?

☐ Electronically, Direct into Assetwise from collector App. as bridge is inspected
☐ All at once at the end of the year from a paper copy into Assetwise
X As each inspection is complete from paper to computer to Assetwise.

4. When is the updated/new inventory data forwarded to ODOT? (Metric 23)

Changes discovered during inspection? Yes X No ☐
Changes from new construction or rehab? Yes X No ☐

5. NBIS requires that the inspecting organization maintain master lists of the following:
(Metric 16,17,11)

a. Bridges that contain fracture critical members, including the location and description of such members on the bridge and the inspection procedures of such members (Each individual FCM member on each FCM bridge must be clearly identified in the bridge file) (Where a FCM Identification Plan exists then look for remaining fatigue life). Master List?

Yes X Number 7 : If, No, Why not? _____ NA ☐

SFNs of Fracture Critical bridges: 4649346, 4653521, 4646223, 4633814, 4632613, 4631838, 4637453. Logan County recently lost a FC bridge (SFN 4649710) as it was damaged beyond repair as a result of a tree falling on it during recent storm events.

b. Bridges requiring underwater inspections.
Number _____ NA X

c. Bridges with unique or special features (i.e., pin & hanger, draw, suspension)
Number_____ NA X

Note: An examination of the files will be performed during the review.
Options: For the files listed below you can email a copy of a typical file or have them on hand for inspection.

- Bridge Files
- Scour Critical POA.
- Fracture Critical Plan.
- UW inspection Procedure

H. PROCEDURES

1. Are new maintenance problems identified during bridge inspection? (Metric 15)
Yes X No ☐

2. How do the inspectors inform maintenance personnel of routine bridge maintenance problems (written, oral, other)? (Metric 15)

☐ Written work order.
☐ Electronic Communication.
X Oral direction.
X Other. Explain **In addition to oral direction, maintenance issues are also written**

3. Who do the inspectors notify when emergency repairs, or critical findings are necessary (action required within 1 week)? (Metric 21)
Check all that apply.

X County Engineer ☐ Bridge Superintendent
☐ County bridge Engineer ☐ Sherriff

How is this emergency action documented? (Must be entered and tracked in Assetwise)

Explain if different than procedure in Assetwise **The emergency action is documented in the bridge's physical file and then noted in the subsequent routine inspection.**

4. If a bridge requires emergency repairs, is this noted as part of the inspection report or as a separate document? (Metric 21)

As noted above, it's documented in the bridge's physical file and then noted in the subsequent routine inspection.

5. Who checks proper placement of signs (load posting, clearance, speed restriction, narrow bridge etc.)? (Metric 15)

The Traffic Superintendant

I. LOAD ANALYSIS AND POSTING

1. Number of plans for existing bridges available for NBIS length bridges.
Unknown but plans are available for approximately 90% of our NBIS bridges

2. Number of plans for non-NBIS bridges (>= 10' and <= 20' long) Unknown

3. **Number of bridges analyzed using the *AASHTO Bridge Evaluation* (Metric 13)**
Unknown

By Whom (Metric 13)

- ☐ Load Rating Engineer
- X County Engineer
- ☐ Bridge Engineer
- X Consultant

4. When are bridges load rated, after initial rating. Check all that apply

- ☐ Every 5 years regardless.
- X When there is a significant change in condition rating.
- ☐ When wearing surface thickness increases more than 1-1/2 inches
- ☐ When permit load is requested
- **X** other

Note: Bridge load ratings are updated when their status/condition changes. Overlays are noted and load ratings are updated in-office on an as-needed basis (i.e. after a bridge deteriorates further or after a rehab project).

5. Methods used (Metric 13)

- [X] AAWSHTO BrR
- [X] Hand Calculated
- [X] Engineering Judgement (BR100)
- [x] BARS or other proprietary software program
- [x] Other Explain: Also use in-house program/spreadsheets

6. Number of NBIS length bridges "not ratable" at all due to lack of data and may have to be field tested. (Metric 13) (*These are bridges that have a coding of **5**, not **0** in the method of analysis Item.)*

Number 42 Plan of action for load rating these? None

7. Number of NBIS length bridges load posted (Metric 14) **(Assetwise Check)**

Number of bridges posted 20 Number of bridges with posted Signs in the field: 20
Note: 4 of these NBIS bridges are rated for EV loads

8. List bridges closed due to condition rating (rough check)

- SFN 4631838 (SFN 4631839 was completed in 2020 and carries the CR 21 traffic that SFN 4631838 carried as well modern traffic loads) and SFN 4649710 (damaged beyond repair as a result of a tree falling on it during recent storm events)

9. List bridges rated less than 100% Ohio legal load and not physically load posted, and resolution. (Assetwise Check)

None.

10. Number of NBIS bridges with Gusset Plates (Metric 13) **6 (SFNs 4632613, 4633814, 4637453, 4646223, 4649346 & 4653521)**

11. Number of NBIS bridges with Gusset Plates analyzed. (Metric 13) **All of them**

12. Describe filing system (where files are kept): (Metric 15)

- Inspection reports, including old inspections:

[X] On paper file in Office
[ ] Electronically
[X] In Assetwise
[ ] All three
[ ] Other

- Design Calculations:

x On paper file in Office
x Electronically
☐ In Assetwise
☐ All three
☐ Other

- Plans:

x On paper file in Office
x Electronically
☐ In Assetwise
☐ All three
☐ Other

- Load analysis calculations:

x On paper file in Office
x Electronically
☐ In Assetwise
☐ All three
☐ Other

- Inventory forms:

☐ On paper file in Office
☐ Electronically
x In Assetwise
☐ All three
☐ Other

- Photos and sketches:

x On paper file in Office
x Electronically
x In Assetwise
☐ All three
☐ Other

- Repairs and maintenance history

x On paper file in Office
☐ Electronically
x In Assetwise
☐ All three
☐ Other

- Scour evaluation:

x On paper file in Office
☐ Electronically
x In Assetwise
☐ All three
☐ Other

- Scour POA:

x On paper file in Office
☐ Electronically
x In Assetwise
☐ All three
☐ Other

- Fracture Critical File:

x On paper file in Office
☐ Electronically
☐ In Assetwise
☐ All three
☐ Other

- Load Posting/Closing:

☐ On paper file in Office
☐ Electronically
☐ In Assetwise
x All three
X Other: Our department also posts load postings on our website

- Underwater inspections: N/A

☐ On paper file in Office
☐ Electronically
☐ In Assetwise
☐ All three
☐ Other

- Special inspection eqpt. or procedures: N/A

☐ On paper file in Office
☐ Electronically
☐ In Assetwise
☐ All three
☐ Other

- Flood data, waterway adequacy, channel cross sections:

X On paper file in Office

☐ Electronically

☐ In Assetwise

☐ All three

☐ Other

Note the NBIS Retention period: BR-86 report 10 years, All records 3 years after bridge removed, Load rating calculations 3 years after a new rating is done.

13. What is the FC bridge inspection frequency? (Metric 16) **Every 24 Months**

14. Is the FC Plan completed for all FC bridges? (Metric 16) **Yes X No ☐**

15. Are the FCM Identified in the FC Plan? (Metric 16) **Yes X No ☐**

16. What is the underwater inspection frequency? (Metric 17) ___**Every _ _ Months**_____
N/A

17. Are the underwater elements identified and located? (Metric 17) **Yes ☐ No ☐**
N/A

18. List any complex bridges: (Metric 19)

N/A

19. Do the complex bridges require specialized inspection procedures and additional inspector training? (Metric 19)

Yes ☐ No ☐

Describe: N/A

Other equipment not listed above: Click or tap here to enter text.

Part II: Field Review

Inspection Reports (metric 12)

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 of the field sampled 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:

LOG-C0005-0806 _(4630459) Concrete Tee-beam

Item 58 Deck……**6** Agreed While there are few spalled areas, it looks like there might be more delaminated areas in the making. The deck was to high for me to sound.

Item 59 Superstructure……**5** Agreed The outside beams are not in good condition, but the interior beams look better, there is substantial efflorescence in the second beams in. Having been built in 1934, typically, the concrete is very hard, durable and is very slow to deteriorate and can be quite strong, even if its' appearance says otherwise. Hence the load rating of 150%. That is why tracking helps in gauging the remaining service life and helps in budget planning.

Item 60 Substructure…….**5** Agreed While the actual spalled areas are not large, the amount of salt saturation of the abutments is extensive. Sounding the areas within reach indicate a slow decline in condition and more spalling to come. (The same argument can be made for the Superstructure as well, even if I could not sound the beams). If this bridge is not scheduled for replacement in the next few years, it would warrant tracking the rate of deterioration.
(*Good substructure comments overall)*

Item 61 Channel……..**9** Agreed

Item 61.01 Scour……..**7** Agreed

Item 62 Culvert……N

Item 36 Railing…….. 0 0 1 0 Agreed

Item 72 Approach Alignment ……**8** Agreed (At Tee Intersection)

Comments: Comments are good, but the location could be a little more specific such as where on the beam is the concrete spalling? Midspan or at the end?

Defect Photos: The close-up defect photos are great, but it would help if there was another photo of the whole beam and superstructure area to get an idea of the extent and location, especially if it is not spelled out in the comments.

Channel Photos: Great Channel photos with labels and all!

LOG-T0030-0080 _(4632613) Steel Truss

Item 58 Deck…….. **5** Agreed
Item 59 Superstructure……**4** Agreed
Item 60 Substructure……**5** Agreed
Item 61 Channel……..**9** Agreed
Item 61.01 Scour……..**7** Agreed
Item 62 Culvert……N
Item 36 Railing……..0 0 0 0 Agreed
Item 72 Approach Alignment …….. 4 Agreed
Comments: Great Comments in Assetwise.
Defect Photos: Great defect photos in Assetwise as the deteriorated areas are circled or highlighted. I am glad your comments reference the photos by number, otherwise it would be hard to correlate the two. Again, it would be outstanding if you had a couple of photos that were more encompassing, to give one the idea of the extent and relative location of the deteriorated portions. It helps the viewer put things into context at a glance.
Channel Photos : Excellent Channel photos in Assetwise

LOG-C0066-0143 _(4636155) Prestressed Box-beams

Item 58 Deck…….. 9 (**5**) Coding misinterpretation, deck must match Superstructure.
Item 59 Superstructure……**5** Agreed
Item 60 Substructure……**6** Agreed
Item 61 Channel…….. **9** Agreed
Item 61.01 Scour…….. **7** Agreed
Item 62 Culvert…….. **N**
Item 36 Railing …….. 0 0 0 0 Agreed
Item 72 Approach Alignment ……..**8** Agreed
Comments: Great comments! Simple and accurate.
Defect Photos: Great defect close ups, just need to add a couple of global wider-angle shots to put is all ion context.
Channel Photos: Great channels photos!

LOG-C0013-0074 _(4631110) Prestressed Box-Beams

Item 58 Deck…….. 9 (**5**) See other box beam bridges comment. Matching Superstructure.
Item 59 Superstructure…… **5** Agreed
Item 60 Substructure……. **6**
Item 61 Channel……..**9** Agreed
Item 61.01 Scour……..**7** Agreed
Item 62 Culvert……N Agreed
Item 36 Railing…… 0 0 0 0 Agreed
Item 72 Approach Alignment …….. **8** Agreed

Comments: Comments are good but could be a little more explicit. For example: It is important to know whether the abutment crack is near a beam seat or out near the wingwall. And which beams have the spalling and strands exposed and where on the beams is it occurring.

Defect Photos: Limited photos in Assetwise, that global/wider angle shot would be very helpful in seeing what is going on from an overall structural perspective.

Channel Photos: Great Channel Photos.

LOG-C0039-0680 _(4633555) Steel Beams

Item 58 Deck…….. **6** Agreed

Item 59 Superstructure……**5** Agreed

Item 60 Substructure……**5** Agreed (Substantial debris caught on piers.)

Item 61 Channel…….. **9** Agreed

Item 61.01 Scour…….. **7** Agreed

Item 62 Culvert……. N Agreed

Item 36 Railing…….. **0 0 0 0** Agreed

Item 72 Approach Alignment …….. **8** Agreed

Comments: Good Comments in Assetwise. Don't forget about the Location, Extent and severity in your comments for a superior report.

Defect Photos: Very Good defect Photos in Assetwise. Again, getting the defect relative to the entire member would be best.

Channel Photos: Channel Photos in Assetwise are OK but could best be represented by a couple more shots to get a clearer picture of the full cross-section of the channel at the bridge.

LOG-C0101-0347 _(4639480) Prestressed Box-beams

Item 58 Deck……9 See previous bridge comments with respect to the deck.

Item 59 Superstructure……4 Agreed (This is a 4 according to the manual verbiage citing joint leakage.) I suspect the beams are in better shape than the rating would indicate.

Item 60 Substructure……8 Agreed

Item 61 Channel……9 Agreed

Item 61.01 Scour…….. 7 Agreed

Item 62 Culvert……N Agreed

Item 36 Railing…… 0 0 0 0 Agreed

Item 72 Approach Alignment ……8 Agreed

Comments: Good comments, just remember to state the location of those spalled areas and where the strands are exposed or broken. It is important to the rating depending on where these instances are located.

Defect Photos: Great defect photos, just need a couple of those overall shots to pull it all together.

Channel Photos: Great channel photos in Assetwise

Field Review Summary:

Overall, the county is doing a very good job with their bridge inspection program. Their inspection records are complete and organized. I found their rating to be well within the parameters set by the manual with the +/- 1 point allowance. The comments could use a little more elaboration at times and corresponding full range photos would help. The channel photos were nearly perfect except for one the 3-span steel beam bridge that was difficult to capture the entire channel and bridge in one shot. I recommend taking multiple angled shots to get it all in. Note: Logan County has more extensive photos, and complete documentation in their office bridge files than what is posted in Assetwise.

PART III Office file Review

Fracture critical bridges 3137082; 3136582; 3134202; 3139840

Fracture Critical Member and Fatigue Prone Connection ID Plan.

LOG-C0039-0680 _(4633555) CR39 over S Fork Miami River
LOG-T0080-0146 _(4637453) Twp Rd 80 over Muchinippi Cr

Bridge Load Rating Report, including Gusset plate analysis.

LOG-T43-0.82 (4633814) TWP 43 over Bokengehalas Cr
LOG-T0080-0146 _(4637453) Twp Rd 80 over Muchinippi Cr

Underwater inspections NA

POA for Scour

Logan County have 2 bridges (4631153 & 4630963) that have a documented POA for scour.

Scour susceptible bridges

Logan County has 285 that are scour susceptible.

Critical findings

Logan County uses the critical finding procedure flow chart in the manual.

All files are complete with all documentation concerning load rating, channel photos and defect photos, along with previous inspection reports. Their files are complete and comprehensive, documenting the history of every bridge through reports, plans and photographs.

PART IV Snapshot DATA Summary of Program

LOGAN County 2022

INVENTORY, APPRAISAL & INSPECTION SNAPSHOT

8/5/2022

Inventory Data - NBIS Bridges Only

	NBIS COUNT
NBIS Bridges > 20'	198
Bridges 10'-20'	96
All Bridges	294

Item 221 Inspection Responsibility		CODE	#NBIS	#ALL
Data Tab Col BV,BW	County	2	198	294

Item 21 Maintenance responsibility		CODE	#NBIS	#ALL
Data Tab	County	2	192	288
Col D	City or other local	4	0	0
	Railroad	27	6	6
	Private (tohter than RR)	26	0	0
	State Park	11	0	0
	Local Park	23	0	0
	State Agency	1	0	0
	Township	3	0	0
			198	294

Item 42A Type service on bridge		CODE	#NBIS	#ALL
Data Tab	Other	0	0	0
Col Q	Highway	1	192	288
	Railroad	2	6	6
	Ped/Bikeway	3	0	0
	Hwy/RR	4	0	0
	Hwy/Ped	5	0	0
			198	294

Item 42B Type service under bridge		CODE	#NBIS	#ALL
Data Tab	Other	0	1	1
Col R	Hwy w/ or w/o Ped	1	6	6
	Railroad	2	2	2
	Ped/Bkwy	3	0	0
	Hwy w/ RR	4	0	0
	Waterway	5	189	285
	Hwy/Waterway	6	0	0
	RR/Waterway	7	0	0
	Hwy/Waterway/RR	8	0	0
	Relief (for waterways)	9	0	0
			198	294

All data is complete and correct in this section.

ITEMS 43A,B,C Structure Type	Data (Col M.N,O)	CODE	#NBIS	#ALL
Other Beam or Girder		002	1	1
Concrete Slab		101	2	6
Concrete Tee Beam		104	1	1
Concrete Box Beam/Girder Multiple		105	3	3
Concrete Frame		107	2	35
Concrete Culvert (incl frame culverts)		119	4	32
Concrete Continuous Slab		201	3	4
Steel Beam or Girder		302	38	45
Steel Girder w/ Floor System		303	1	1
Steel Deck Truss		309	1	1
Steel Thru Truss (inlcudes Pony)		310	8	8
Steel Culvert (incl frame culverts)		319	2	15
Steel Continuous Beam or Girder		402	3	3
Prestr. Conc. Cont. Box Beam/Girder Multiple		505	123	127
Timber Slab		701	1	1
Timber Thru Truss (inlcudes Pony)		710	2	2
Timber Culvert (incl frame culverts)		719	0	1
Timber Culvert (incl frame culverts)		819	0	1
Aluminum or Iron Deck Arch		911	2	2
Aluminum or Iron Culvert (incl frame culverts)		919	1	5
			198	294

Item 92A Fracture Critical		CODE	#NBIS	#ALL
Data Tab	Requires FC Inspection	Y	8	n/a
Col U,V,Y	Requires FC Inspection	N	190	n/a
			198	n/a
	FC Switch Y/N is Blank		0	n/a

Item 113 Scour			#NBIS	#ALL
Data Tab	Bridge not over waterway	N	9	9
Col AA	unknown foundation	U	0	0
	over tidal waters	T	0	0
	foundations on dry land	9	1	1
	stable above footing	8	23	27
	countermeasures installed	7	0	0
	no scour evaluation made	6	0	0
	stable within footer limits	5	153	238
	stable action needed	4	10	17
	scour critical - unstable	3	2	2
	scour critical - scour present	2	0	0
	scour critical - failure immine	1	0	0
	scour critical - bridge failed	0	0	0
			198	294

LOG-C0010-0875 _(4630874) LOG-C0012-0742 _(4631102) LOG-C0049-0055 _(4634411)
LOG-C0054-0617 _(4634942) LOG-C0087-0150 _(4638042) LOG-C0091-0604 _(4638484)
LOG-C0277-0032 _(4655036) LOG-T0003-0166 _(4630254) LOG-T0030-0080 _(4632613)
LOG-T0075-0010 _(4636937) LOG-C0044-0022 _(4633938) LOG-C0068-0046 _(4636260)
LOG-C0073-0128 _(4636759) LOG-C0101-0164 _(4639456) LOG-T0056-0068 _(4635116)
LOG-T0182-0118 _(4647165) LOG-T0211-0122 _(4649958)
LOG-C0011-0895 _(4630963) LOG-C0013-0720 _(4631153)

The 17 bridges (in black) above have a non-critical finding scour rating of 4, that requires corrective measures. Once the measures are implemented the scour rating should move to a 7. See Column AA in Data TAB of the Snapshot for olive highlights.
Note: (If these measures were taken, then the rating needs changed. If not, then you need a plan for corrective measures. A code of 4 or less should not be in the system for more than a year.)
The two bridges in Green have a rating of 3. These two bridges should have a corrective action plan to take corrective measures before the next inspection date.

Item 63	Documented Engineering Judgment		#NBIS	#ALL
	Field Eval & Doc EJ		14	n/a
		BR_100 for these bridges?		

Item 92B	Underwater	CODE	#NBIS	#ALL
Data Tab	requires dive inspection	N	198	n/a
Col W,X,Z	requires dive inspection	Y	0	n/a
			198	

Item 709	Plan Information	CODE	#NBIS	#ALL
Data Tab	plans not avail	0	13	14
Col. AW	plan avail	1	179	274
	field measured	2	0	0
	Field Testing	3	0	0
	not applicable	N	6	6
			198	294

Item 63	Method of Analysis	CODE	#NBIS	#ALL
Data Tab	Field Eval & Doc. Engr Judgme	0	14	15
Col. AV	Work Stress	1	0	0
	LFR	2	0	0
	LRFR	3	0	0
	load test	4	0	0
	No rating done	5	6	48
	LFR	6	122	143
	AS	7	34	55
	LRFR	8	22	33
	Assigned LFR HS20	D	0	0
	Assigned LRFR HL93	F	0	0
	not appl (RR, etc)	X	0	0
			198	294

REMINDER:
Load Factor required for bridges built after 1993 **(exceptions: timber, etc,)**
LRFR required for bridges built after 2010

Note: Given the changes coming in 2023 and the now required shear analysis, please make sure your load rating documentations are complete and include a BR100 with complete statements of assumptions, measurements and methodologies for anything using engineering judgement.

All data is complete and correct in this section.

KEY METRICS

(C)	Compliant	(CC)	Conditionally Compliant
(SC)	Substantially Compliant	(NC)	Non- Compliant
		(NC)	(SC) If corrected within 6/12 months
			Refresher=6 mo, Comprehensive=12 mo

METRIC 2 - Program Manager Qualificatio (from files examination)

From Files review	Missing	#sampled	% PASS	COMPLIANCE
PE /Experience	0	1	100.0%	(C)
Comprehensive	0	1	100.0%	(C)
Refresher	0	1	100.0%	(C)

METRIC 3 - Team Leader Qualification (from files examination)

From Files review	Missing	#sampled	% PASS	COMPLIANCE
Degree /Experience	0	1	100.0%	(C)
Comprehensive	0	1	100.0%	(C)
Refresher	0	1	100.0%	(C)

METRIC 6 Insp. Frequency Routine

Bridge Inspections Overdue			# OVERDUE	% PASS	COMPLIANCE
Data Tab	NBIS -	24 months	8	96.0%	(SC)
Col. AB	ORC -	Calendar Year	4	98.0%	(SC)
Col. AB	All	Routine insp.	17		
	BIM -	18 months	0	100.0%	(C)

See DATA TAB Column AB, BX and CA for dates. (A few of these were just inspected and have not been approved by the time this report was generated.

METRIC 8 - Insp. Frequency Underwater

Dive Inspections Overdue		# OVERDUE	# UW	% PASS	COMPLIANCE
Data Tab Col. Z	60 months	0	0	100.0%	(C)

METRIC 10 - Insp. Frequency FC Member

FC Inspections Overdue		# OVERDUE	# FC	% PASS	COMPLIANCE
Data Tab Col. Y	24 months	3	8	98.5%	(SC)

LOG-C0021-0100 _(4631838) overdue for FC inspection 7/30/2020
LOG-T0080-0146 _(4637453) overdue for FC inspection 12/07/2020
LOG-T0204-0028 _(4649346) overdue for FC inspection 12/18/2020

All data is complete and correct in this section.

Inspection Condition Data - NBIS Bridges Only

Item 41	Operating Status	CODE	# NBIS	# ALL
Data Tab	Open, No restriction	A	175	270
Col AM	Open, posting recommended	B	0	0
	Open, Half width constr.	C	0	0
	Open because of temp. fix	D	0	0
	Open using temp. structure	E	0	0
	New struture not yet open	G	0	0
	closed for load cap. reason	K	2	2
	Posted for load capacity	P	21	22
	Posted for other than load	R	0	0
	Closed for other than load	X	0	0
			198	294

Metric 13	Load Rating Data	
Load Rating Tab		# OF ERRORS
Col. AN	Op RF greater than Inv RF?	0
Col. AO	Posting and % Legal OK?	0
Col. AP	"0" used instead of blank	0
Col. AT	% legal <> lowest RF	1
Col.A V	Item 70 correct?	0
Col. AW	Method of Rating Alike?	0
Col. AX	Op & Inv RF in Tons as req'd?	0
Col. AY	Item 575 correct?	0
Col. AZ	Depth of fill completed?	0

LOG-T0086-0287 _(4637968) Lowest Load factor is 1.34 for the EV3, so Item 734 should be 135%

All data is complete and correct in this section.

METRIC 12 - Routine Inspection		(** from field review)			
Field Ratings		**#>+/-1**	**# Ratings**	**% PASS**	**COMPLIANCE**
	field ratings**	**0**	**24**	100.0%	(C)
Comments		**Missing**	**#<6**	**% PASS**	
Tab	Comments when Rating <6	0	190	100.0%	(C)
	Adequacy comments **	**0**	**30**	100.0%	(C)
		Error	**Total Scour**	**% PASS**	
Comment	Rating should be = Scour	0	187	100.0%	within tolerance +/- 1
Tab	Noncompliant Scour Rating Er	0	187	100.0%	(C)

METRIC 14 - Posting	Load rating data tab			
From Files review	**# errors**	**#sampled**	**% PASS**	**COMPLIANCE**
Op RF < 3 tons but not closed	0	198	100.0%	(C)
Op RF = 0 but not closed	0	198	100.0%	(C)
% Legal < 100 but not posted	0	198	100.0%	(C)
Item 41 = B	0	198	100.0%	(C)

METRIC 16 - Fracture Critical Inspection	(from files examination)			
From Files review	**Missing**	**# FC**	**% PASS**	**COMPLIANCE**
Fract Critical Member ID	0	2	100.0%	(C)
Fatigue Prone Detail	0	2	100.0%	(C)
Gusset Plate Calculations	0	2	100.0%	(C)
FC Inspection Procedure	0	2	100.0%	(C)

METRIC 17 - Underwater Inspection	(from files examination)			
From Files review	**Missing**	**# UW**	**% PASS**	**COMPLIANCE**
UW Inspection Procedure	0	1	100.0%	(C)
Location of UW elements	0	1	100.0%	(C)
UW frequency identified	0	**1**	100.0%	(C)

All data is complete and correct in this section.

PRELIMINARY FHWA 23 Metric Matrix

23 metrics used by FHWA to measure NBIS compliance

Compliance Codes for the following Metrics:

(C)	Compliant
(SC)	Substantially Compliant
(CC)	Conditionally Compliant (Adhering to approved PCA)
(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

Data QAR Summary:
Logan County has been doing a very good job managing their Bridge Data program. Only 3 bridges were noted as being late for inspection, but inspections, were completed a few days before this report was run and had not been approved in time.

Only one bridge was not properly coded in Item 734 for the % legal. All other data fields were properly completed with no missing data or other coding errors.

Their inspection program has everyone current with their certifications and training. All bridges to date have been routinely inspected on time and there were no disagreements with respect to the condition ratings. There were a few prestressed concrete box beam bridges where the deck was improperly rated independently from the superstructure, but that has been corrected.