# Madison County 2019 INVENTORY, APPRAISAL & INSPECTION SNAPSHOT

## Inventory Data - NBIS Bridges Only

| | NBIS COUNT |
|---|---|
| **NBIS Bridges > 20'** | **94** |
| **Bridges 10'-20'** | **89** |
| | **183** |
| ***Possible NBIS length errors** | 1 |

| Item 221 | Inspection Responsibility | CODE | COUNT | % |
|---|---|---|---|---|
| | County | 3 | 94 | 100.0% |
| **Item 21** | **Maintenance responsibility** | | | |
| | County | 3 | 94 | 100.0% |
| | City or other local | 4 | 0 | 0.0% |
| | Railroad | 6 | 0 | 0.0% |
| | Private | 7 | 0 | 0.0% |
| | ODNR | A | 0 | 0.0% |
| | Park District | C | 0 | 0.0% |
| | Township | F | 0 | 0.0% |
| | | | 94 | 100.0% |
| **Item 42A** | **Type service on bridge** | | | |
| | Other | 0 | 0 | 0.0% |
| | Highway | 1 | 94 | 100.0% |
| | Railroad | 2 | 0 | 0.0% |
| | Ped/Bikeway | 3 | 0 | 0.0% |
| | Hwy/RR | 4 | 0 | 0.0% |
| | Hwy/Ped | 5 | 0 | 0.0% |
| | RR Abnd. rails rem'vd | A | 0 | 0.0% |
| | | | 94 | 100.0% |
| **Item 42B** | **Type service under bridge** | | | |
| | Hwy w/ or w/o Ped | 1 | 0 | 0.0% |
| | Railroad | 2 | 0 | 0.0% |
| | Ped/Bkwy | 3 | 0 | 0.0% |
| | Hwy w/ RR | 4 | 0 | 0.0% |
| | Waterway | 5 | 94 | 100.0% |
| | Hwy/Waterway | 6 | 0 | 0.0% |
| | RR/Waterway | 7 | 0 | 0.0% |
| | Hwy/Wtrway/RR | 8 | 0 | 0.0% |
| | Relief (RR w/o tracks) | 9 | 0 | 0.0% |
| | | | 94 | 100.0% |

| ITEMS | Structure Type (Items 43A, 43B, 43C) | CODE | COUNT | % |
|---|---|---|---|---|
| | composite arch filled | 095 | 1 | 1.1% |
| | concrete slab continuous | 112 | 6 | 6.4% |
| | concrete beam simple | 121 | 2 | 2.1% |
| | concrete box beam simple | 131 | 1 | 1.1% |
| | concrete arch deck | 153 | 1 | 1.1% |
| | concrete girder thru | 164 | 1 | 1.1% |
| | concrete frame simple | 171 | 5 | 5.3% |
| | concrete culvert filled | 195 | 2 | 2.1% |
| | prestressed conc. beam simple | 221 | 5 | 5.3% |
| | prestressed conc. beam continuous | 222 | 1 | 1.1% |
| | prestressed conc. box beam simple | 231 | 33 | 35.1% |
| | prestressed conc. box beam continuous | 232 | 13 | 13.8% |
| | steel beam simple | 321 | 5 | 5.3% |
| | steel beam continuous | 322 | 6 | 6.4% |
| | steel culvert filled | 395 | 2 | 2.1% |
| | timber truss thru | 444 | 1 | 1.1% |
| | aluminum arch deck | 653 | 1 | 1.1% |
| | aluminum culvert filled | 695 | 2 | 2.1% |
| | steel truss (pony) | 34A | 6 | 6.4% |
| | | | 94 | 100.0% |

| Item 92A | *Fracture Critical | CODE | COUNT | % |
|---|---|---|---|---|
| | fracture critical member | Y | 6 | 6.4% |
| | fracture critical member | N | 86 | 91.5% |
| | | | 92 | 97.9% |
| | No. of steel trusses and girders | 6 34x, 36x | 6 | |
| | | | 2 blank | 1 closed |

| Item 113 | Scour | | | |
|---|---|---|---|---|
| | Bridge not over waterway | N | 0 | 0.0% |
| | unknown foundation | U | 0 | 0.0% |
| | over tidal waters | T | 0 | 0.0% |
| | foundations on dry land | 9 | 6 | 6.4% |
| | stable above footing | 8 | 83 | 88.3% |
| | countermeasures installed | 7 | 1 | 1.1% |
| | no scour evaluation made | 6 | 0 | 0.0% |
| | stable within footer limits | 5 | 4 | 4.3% |
| | stable action needed | 4 | 0 | 0.0% |
| | scour critical - unstable | 3 | 0 | 0.0% |
| | scour critical - scour present | 2 | 0 | 0.0% |
| | scour critical - failure imminent | 1 | 0 | 0.0% |
| | scour critical - bridge failed | 0 | 0 | 0.0% |
| | | | 94 | 100.0% |

**High number of code 8**

| Item 92B | Underwater | CODE | COUNT | % |
|---|---|---|---|---|
| | requires dive inspection | N | 92 | 97.9% |
| | requires dive inspection | Y | 0 | 0.0% |
| | dive inspection dates | | 0 | 0.0% |
| | | | 92 | 97.9% |
| | | | *2 blank | |

| Item 709 | *Plan Information | CODE | COUNT | % |
|---|---|---|---|---|
| | no plans | 0 | 7 | 7.4% |
| | plans available | 1 | 78 | 83.0% |
| | field information | 2 | 6 | 6.4% |
| | not applicable | N | 0 | 0.0% |
| | | | 91 | 96.8% |
| | | | *3 blank | |

| Item 63 | *Documented Engineering Judgment | | | COUNT | % |
|---|---|---|---|---|---|
| | Field Eval & Doc EJ | | | 2 | 2.1% |
| | Rating Code in Error | D and F | 0 171 or 195 | 0 | |
| | | | BR_100 for these bridges? | | |

| Item 580 | Deep Culverts | (depth of fill) | COUNT | % |
|---|---|---|---|---|
| | Culvert | fill>6.5' | 0 | 0.0% |

| Items | 195 Culvert vs 171 Frame | (Items 43A, 43B, 43C) | COUNT | % |
|---|---|---|---|---|
| | # that do NOT meet the 2' Rule | | 0 | 0.0% |

| Item 63 | *Method of Analysis | CODE | COUNT | % |
|---|---|---|---|---|
| | Field Eval & Doc. Eng Judgment | 0 | 2 | 2.1% |
| | Load testing | 4 | 0 | 0.0% |
| | No Rating done | 5 | 0 | 0.0% |
| | Load Factor (LF) | 6 | 34 | 36.2% |
| | WS or AS | 7 | 19 | 20.2% |
| | Load & Resistance Factor | 8 | 39 | 41.5% |
| | Assigned Rating (LFR) HS20 | D | 0 | 0.0% |
| | Assigned Rating (LRFR) HL93 | F | 0 | 0.0% |
| | Not applicable (Ped, RR, Bldg) | X | 0 | 0.0% |
| | | | 94 | 100.0% |

**REMINDER:**

**Load Factor required for bridges built after 1993 (with certain exceptions)**

# Inspection Condition Data - NBIS Bridges Only

| Item 41 | *Operating Status | CODE | COUNT | % |
|---|---|---|---|---|
| | Open, No restriction | A | 88 | 93.6% |
| | Open, posting recommended | B | 0 | 0.0% |
| | Open, Half width construction | C | 0 | 0.0% |
| | Open because of temporary fix | D | 0 | 0.0% |
| | Open using temporary structure | E | 0 | 0.0% |
| | New struture not yet open | G | 0 | 0.0% |
| | closed for load capacity reason | K | 1 | 1.1% |
| | Posted for load capacity | P | 5 | 5.3% |
| | Posted for other than load | R | 0 | 0.0% |
| | Closed for other than load | X | 0 | 0.0% |
| | | | 94 | 100.0% |

| | *General Appraisal | | CODE | | COUNT | % |
|---|---|---|---|---|---|---|
| GOOD | 54.3% | Excellent | 9 | | 8 | 8.5% |
| | | Very good | 8 | | 30 | 31.9% |
| | | Good | 7 | | 13 | 13.8% |
| FAIR | 29.8% | Satisfactory | 6 | | 15 | 16.0% |
| | | Fair | 5 | | 13 | 13.8% |
| POOR | 16.0% | Poor | 4 | | 10 | 10.6% |
| | | Serious | 3 | | 4 | 4.3% |
| | | Critical | 2 | K | 1 | 1.1% |
| | | Imminent Failure | 1 | K | 0 | 0.0% |
| | | Closed | 0 | K | 0 | 0.0% |
| | | | | | 94 | 100.0% |

**FHWA Performance Measures**

| Performance | % Deck Area | | | Lowest of GA or Deck | COUNT | Deck s.f |
|---|---|---|---|---|---|---|
| GOOD | 52.8% | 5.3% | 9 | Excellent | 8 | 10,355 |
| | | 27.7% | 8 | Very good | 27 | 53,923 |
| | | 19.7% | 7 | Good | 15 | 38,294 |
| FAIR | 21.0% | 15.7% | 6 | Satisfactory | 16 | 30,442 |
| | | 5.3% | 5 | Fair | 10 | 10,365 |
| POOR | 26.2% | 10.7% | 4 | Poor | 10 | 20,731 |
| | | 13.5% | 3 | Serious | 7 | 26,278 |
| | | 2.1% | 2 | Critical | 1 | 4,004 |
| | | 0.0% | 1 | Imminent Failure | 0 | 0 |
| | | 0.0% | 0 | Closed | 0 | 0 |
| | 100.0% | 100.0% | | | 94 | 194,392 |

| Items | AGE of BRIDGES | (Items 27, 106) | YEAR (built or rehab) | COUNT | |
|---|---|---|---|---|---|
| | | | -1900 | 0 | 0.0% |
| | | | 1901-1910 | 0 | 0.0% |
| | | | 1911-1920 | 1 | 1.1% |
| | | | 1921-1930 | 0 | 0.0% |
| | | | 1931-1940 | 0 | 0.0% |
| | | | 1941-1950 | 0 | 0.0% |
| | | | 1951-1960 | 4 | 4.3% |
| | | | 1961-1970 | 11 | 11.7% |
| | | | 1971-1980 | 11 | 11.7% |
| | | | 1981-1990 | 10 | 10.6% |
| | | | 1991-2000 | 27 | 28.7% |
| | | | 2001-2010 | 17 | 18.1% |
| | | | 2011-2020 | 13 | 13.8% |
| | | | | 94 | 100.0% |

| Load Rating Errors | COUNT |
|---|---|
| GVW is incorrect | 2 |
| Inv and OpMethod of Rating need to be equal | 1 |
| Item 709 Rating source is blank | 3 |
| Legal Load RFs extremely high (>15.000). Need to check load rating | 1 |
| Legal Load RF should not be equal to each other except when Method of Rating = 0,4,5 or metal culverts | 10 |

| Load Ratings Due | COUNT |
|---|---|
| SHV due end 2020 DONE | 6 |
| SHV Load Ratings Due end 2020 | 10 |
| EV Load Ratings DONE | 8 |
| EV Load Ratings Due end 2022 ON HOLD | 10 |
| EV Load Ratings needed because of date | 0 |

(C) Compliant
(SC) Substantially Compliant
(CC) Conditionally Compliant (Adhering to approved pan of corrective action)
(NC) Not Compliant

**METRIC 6 Insp. Frequency Routine**

| Bridge Inspections Overdue | | ACTUAL COUNT | % COMPLIANT | COMPLIANCE |
|---|---|---|---|---|
| NBIS - | 24 months | 0 | 100.0% | (C) |
| ORC - | Calendar Year | 0 | 100.0% | (C) |
| BIM - | 18 months | 0 | 100.0% | (C) |

**METRIC 8 - Insp. Frequency Underwater**

| Dive Inspections Overdue | ACTUAL COUNT | % COMPLIANT | COMPLIANCE |
|---|---|---|---|
| 60 months | 0 | N/A | (C) |

**METRIC 10 - Insp. Frequency FC Member**

| FC Inspections Overdue | ACTUAL COUNT | % COMPLIANT | COMPLIANCE |
|---|---|---|---|
| 24 months | 0 | 100.0% | (C) |

**METRIC 13 - Load Rating**

| Type of Metric check | Need for compliance | # Not Rated | % of NBIS Rated | COMPLIANCE |
|---|---|---|---|---|
| Deck, Super, Sub, Culvert Summary <=4 | 100% | 0 | 100.0% | (C) |
| Operating Status = D or E | 100% | 0 | 100.0% | (C) |
| FC=Y | 100% | 0 | 100.0% | (C) |
| Operating Status = P or R | 100% | 0 | 100.0% | (C) |
| Bridges with no restrictions | 100% | 0 | 100.0% | (C) |

***METRIC 14 - Post or Restrict**

| Bridge posting/closing Follow-through | COUNT | % COMPLIANT | COMPLIANCE |
|---|---|---|---|
| Bridges below 10% legal but not closed | 0 | 100.0% | (C) |
| Operating Rating Factor = 0 but not closed | 0 | 100.0% | (C) |
| Bridges < 100% legal but not posted (OpStatus =A or R) | 0 | 100.0% | (C) |
| Bridges to be posted but aren't (Op Status code B) | 0 | 100.0% | (C) |

**METRIC 22 - Inventory (partial review)**

| Structure Length | ACTUAL COUNT | COMPLIANCE |
|---|---|---|
| Number of bridges with length or span difference | 0 | depends on sample size |
| ***Culvert Span** | | |
| unusually long steel culvert spans | 0 | depends on sample size |
| ***Location** | | |
| Item 9 Location | 0 | depends on sample size |
| missing coordinates | 0 | depends on sample size |

## 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

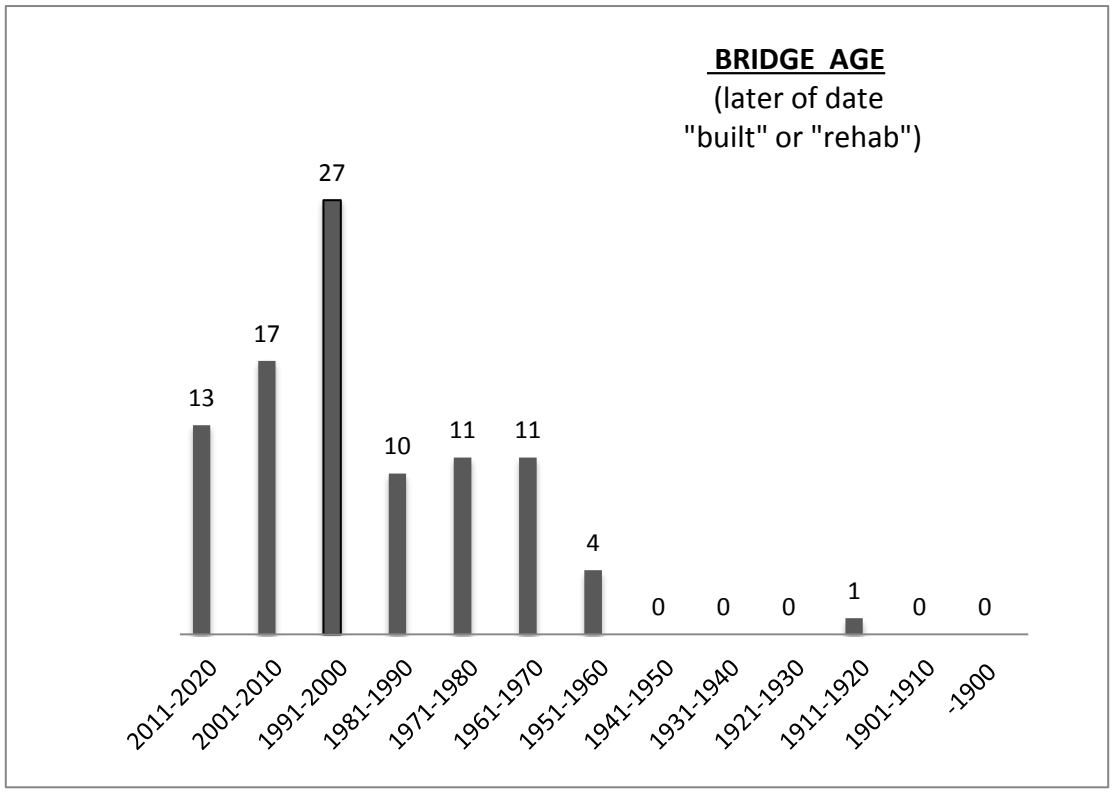
| Metric | Description | (C) | (SC) | (CC) | (NC) |
|---|---|---|---|---|---|
| 1 | State Bridge Inspection Organization | | | | |
| 2 | Program Manager Qualification | | | | |
| 3 | Team Leader Qualification | | | | |
| 4 | Load Rating Engineer Qualification | | | | |
| 5 | UW Bridge Inspection Diver 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 | | | | |

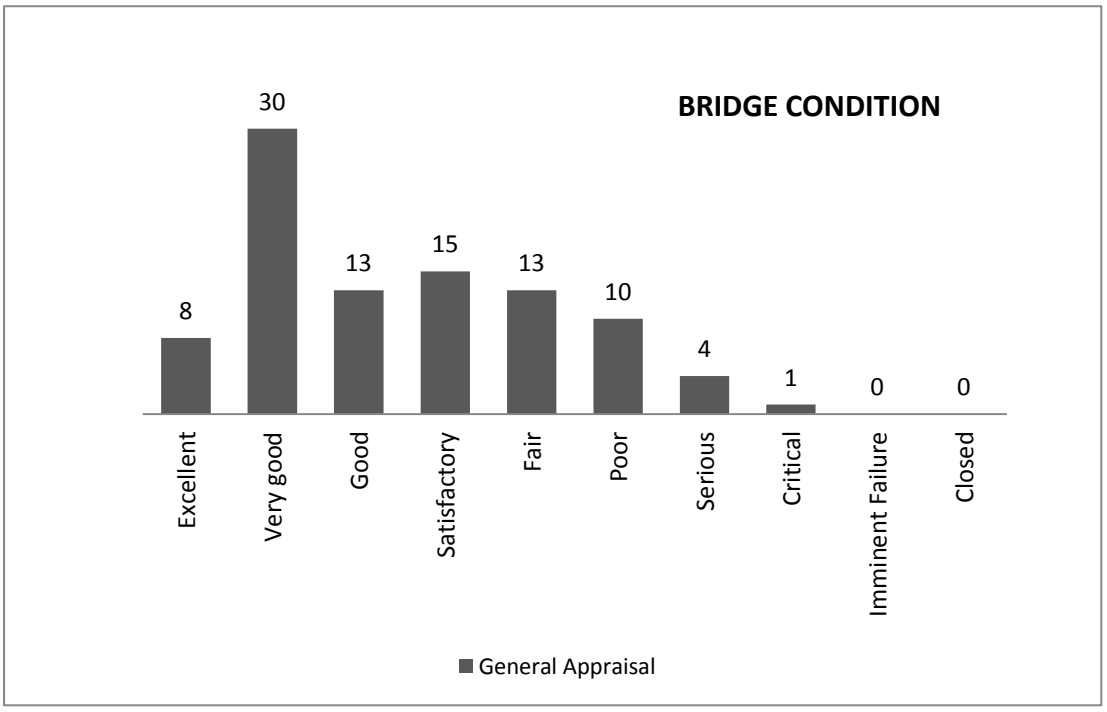
** based on results of Field Review

| Metric | Action Needed |
|---|---|
| 12 | Detailed Comments needed when Summary <=5 plus photos or sketches |

# AGE VS. CONDITION

Overall Shape of AGE and CONDITION graphs typically mirror each other



## GENERAL APPRAISAL COMPARISON