

# 2018 INVENTORY, APPRAISAL & INSPECTION SNAPSHOT

## Huron County

### Inventory Data - BR 87 NBIS Bridges Only

|                    |                          |
|--------------------|--------------------------|
|                    | <b><u>NBIS COUNT</u></b> |
| NBIS Bridges > 20' | <b>222</b>               |
| Bridges 10'-20'    | <b>184</b>               |
|                    | <b>406</b>               |

Possible NBIS length errors\* 8

| Item     | Inspection Responsibility   | CODE | COUNT | %      |
|----------|-----------------------------|------|-------|--------|
| Item 221 | County                      | 3    | 222   | 100.0% |
| Item 21  | Maintenance responsibility* |      |       |        |
|          | County                      | 3    | 220   | 99.1%  |
|          | City or other local         | 4    | 0     | 0.0%   |
|          | Railroad*                   | 6    | 2     | 0.9%   |
|          |                             |      | 222   | 100.0% |
| Item 42A | Type service on bridge*     |      |       |        |
|          | Other                       | 0    | 0     | 0.0%   |
|          | Highway                     | 1    | 217   | 97.7%  |
|          | Railroad                    | 2    | 1     | 0.5%   |
|          | Ped/Bikeway                 | 3    | 0     | 0.0%   |
|          | Hwy/RR                      | 4    | 4     | 1.8%   |
|          | Hwy/Ped                     | 5    | 0     | 0.0%   |
|          | RR Abnd. rails rem'vd       | A    | 0     | 0.0%   |
|          |                             |      | 222   | 100.0% |
| Item 42B | Type service under bridge*  |      |       |        |
|          | Hwy w/ or w/o Ped           | 1    | 1     | 0.5%   |
|          | Railroad*                   | 2    | 5     | 2.3%   |
|          | Ped/Bkwy                    | 3    | 0     | 0.0%   |
|          | Hwy w/ RR                   | 4    | 0     | 0.0%   |
|          | Waterway                    | 5    | 216   | 97.3%  |
|          | 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%   |
|          | Other                       | 0    | 0     | 0.0%   |
|          |                             |      | 222   | 100.0% |

| ITEMS | Structure Type* (Items 43A, 43B, 43C) | CODE | COUNT | %      |
|-------|---------------------------------------|------|-------|--------|
|       | concrete beam simple                  | 121  | 34    | 15.3%  |
|       | concrete box beam simple              | 131  | 1     | 0.5%   |
|       | concrete frame simple                 | 171  | 20    | 9.0%   |
|       | concrete culvert filled               | 195  | 2     | 0.9%   |
|       | prestressed conc. beam simple         | 221  | 1     | 0.5%   |
|       | prestressed conc. box beam simple     | 231  | 98    | 44.1%  |
|       | prestressed conc. box beam continuous | 232  | 1     | 0.5%   |
|       | steel beam other                      | 320  | 1     | 0.5%   |
|       | steel beam simple                     | 321  | 25    | 11.3%  |
|       | steel beam continuous                 | 322  | 2     | 0.9%   |
|       | steel truss thru                      | 344  | 2     | 0.9%   |
|       | steel culvert filled                  | 395  | 3     | 1.4%   |
|       | timber beam simple                    | 421  | 4     | 1.8%   |
|       | stone arch filled                     | 555  | 1     | 0.5%   |
|       | Steel Truss Pony                      | 34A  | 27    | 12.2%  |
|       |                                       |      | 222   | 100.0% |

| Item 92A  | Fracture Critical*  | CODE           | COUNT        | %     |
|---|---|----------------|--------------|-------|
|   | fracture critical member  | Y              | 29           | 13.1% |
|   | fracture critical member  | N              | 185          | 83.3% |
|   |   |                | 214          | 96.4% |
|   | No. of steel trusses and girders  | 34x, 36x       | 29           |       |
|   | No. Y/N switch is missing   |                | 8            |       |
| <b>Fracture Critical File</b>                                   |   |                | <b>COUNT</b> |       |
|   | Required Fracture Critical Files<br>(including written Procedure and FPD) | 29 truss/girde | 29           |       |
| <b>Gusset Pl. Analysis</b> to be completed by December 31, 2011 |   |                | <b>COUNT</b> |       |
|   | Required Gusset Plate Analysis  | trusses        | 28           |       |

| Item 92B | Underwater*              | CODE | COUNT | %     |
|----------|--------------------------|------|-------|-------|
|          | requires dive inspection | N    | 214   | 96.4% |
|          | requires dive inspection | Y    | 0     | 0.0%  |
|          | dive inspection dates    |      | 0     | 0.0%  |
|          | Blank Dive Y/N switch    |      | 8     | 3.6%  |
|          |                          |      | 214   | 0.0%  |

| Item 113 Scour                    |   |  |     |        |
|-----------------------------------|---|--|-----|--------|
| Bridge not over waterway          | N |  | 6   | 2.7%   |
| unknown foundation                | U |  | 0   | 0.0%   |
| over tidal waters                 | T |  | 0   | 0.0%   |
| foundations on dry land           | 9 |  | 113 | 50.9%  |
| stable above footing              | 8 |  | 45  | 20.3%  |
| countermeasures installed         | 7 |  | 23  | 10.4%  |
| no scour evaluation made          | 6 |  | 0   | 0.0%   |
| stable within footer limits       | 5 |  | 35  | 15.8%  |
| 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%   |
|                                   |   |  | 222 | 100.0% |

**Scour Photos on Schedule?**

| Item 709 Plan Information* |      |       |        |
|----------------------------|------|-------|--------|
|                            | CODE | COUNT | %      |
| no plans                   | 0    | 10    | 4.5%   |
| plans available            | 1    | 159   | 71.6%  |
| field information          | 2    | 52    | 23.4%  |
| not applicable             | N    | 1     | 0.5%   |
|                            |      | 222   | 100.0% |

| Item 63 Documented Engineering Judgment* |              |       |      |
|--|--------------|-------|------|
|  |              | COUNT | %    |
| Field Eval & Doc EJ error                |              | 1     | 0.5% |
| Rating Code in Error                     | D and F      | 0     | 0.0% |
|  | 0 171 or 195 | 0     | 0.0% |

**BR\_100 for these bridges**

| ITEMS | Rating Factor* (Items 64, 66)                         | COUNT | %    |
|-------|---|-------|------|
|       | Inventory RF >= Operating RF*                         | 2     | 0.9% |
|       | Inventory Rating Factor < 40% Operating RF (Too Low)  | 0     | 0.0% |
|       | Operating Rating Factor < 40% Ohio % Legal (Too Low)* | 0     | 0.0% |
|       | Op RF < 0.61 not Posted*                              | 0     | 0.0% |
|       | Op RF in tons for Eng Judgment                        | 0     | 0.0% |

| Item 63 Method Of Rating = 5* |  |       |      |
|-------------------------------|--|-------|------|
|                               |  | COUNT | %    |
|                               |  | 0     | 0.0% |

| Item 580 Deep Culverts (depth of fill) |           |       |      |
|--|-----------|-------|------|
|  |           | COUNT | %    |
| Culvert                                | fill>6.5' | 1     | 0.5% |

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

| Item 63                 | Method of Analysis             | <u>CODE</u> | <u>COUNT</u> | <u>%</u> |
|-------------------------|--------------------------------|-------------|--------------|----------|
|                         | Field Eval & Doc. Eng Judgment | 0           | 10           | 4.5%     |
|                         | Load testing                   | 4           | 0            | 0.0%     |
|                         | No Rating done                 | 5           | 1            | 0.5%     |
|                         | Load Factor (LF)               | 6           | 173          | 77.9%    |
| <b>New BrR software</b> | <b>WS or AS</b>                | 7           | 24           | 10.8%    |
|                         | Load & Resistance Factor       | 8           | 14           | 6.3%     |
|                         | 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%     |
|                         |                                |             | 222          | 100.0%   |

**REMINDER:**

**Load Factor required for bridges built after 1993 (with certain exceptions)**  
**LRFR required for bridges built after 2010**  
**AS allowed for Timber and Masonry**

### Inspection Condition Data - BR 86 NBIS Bridges Only

| General Appraisal  | <u>CODE</u> | <u>COUNT</u> | <u>%</u> |        |
|--------------------|-------------|--------------|----------|--------|
| 9 Excellent        | 9           | 64           | 28.8%    |        |
| 8 Very good        | 8           | 34           | 15.3%    |        |
| 7 Good             | 7           | 32           | 14.4%    |        |
| 6 Satisfactory     | 6           | 42           | 18.9%    |        |
| 5 Fair             | 5           | 26           | 11.7%    |        |
| 4 Poor             | 4           | 23           | 10.4%    |        |
| 3 Serious          | 3           | 1            | 0.5%     |        |
| 2 Critical         | 2           | K 0          | 0.0%     |        |
| 1 Imminent Failure | 1           | K 0          | 0.0%     |        |
| 0 Closed           | 0           | K 0          | 0.0%     |        |
|                    |             |              | 222      | 100.0% |

| Performance |  | % Bridges | General Appraisal | CODE | # Bridges | % Bridges |
|-------------|--|-----------|-------------------|------|-----------|-----------|
| GOOD        |  | 58.8%     | Excellent         | 9    | 64        | 29.0%     |
|             |  |           | Very good         | 8    | 34        | 15.4%     |
|             |  |           | Good              | 7    | 32        | 14.5%     |
| FAIR        |  | 30.3%     | Satisfactory      | 6    | 42        | 19.0%     |
|             |  |           | Fair              | 5    | 25        | 11.3%     |
| POOR        |  | 10.9%     | Poor              | 4    | 23        | 10.4%     |
|             |  |           | Serious           | 3    | 1         | 0.5%      |
|             |  |           | Critical          | 2    | 0         | 0.0%      |
|             |  |           | Imminent Failure  | 1    | 0         | 0.0%      |
|             |  |           | Closed            | 0    | 0         | 0.0%      |
|             |  | 100.0%    |                   |      | 221       | 100.0%    |

| Performance |  | % Deck Area |        | Lowest of GA or Deck | COUNT            | Deck s.f |         |
|-------------|--|-------------|--------|----------------------|------------------|----------|---------|
| GOOD        |  | 66.9%       | 30.0%  | 9                    | Excellent        | 62       | 100,347 |
|             |  |             | 17.7%  | 8                    | Very good        | 32       | 59,061  |
|             |  |             | 19.3%  | 7                    | Good             | 33       | 64,575  |
| FAIR        |  | 23.1%       | 14.3%  | 6                    | Satisfactory     | 42       | 47,865  |
|             |  |             | 8.8%   | 5                    | Fair             | 23       | 29,566  |
| POOR        |  | 9.9%        | 9.7%   | 4                    | Poor             | 28       | 32,324  |
|             |  |             | 0.2%   | 3                    | Serious          | 1        | 818     |
|             |  |             | 0.0%   | 2                    | Critical         | 0        | 0       |
|             |  |             | 0.0%   | 1                    | Imminent Failure | 0        | 0       |
|             |  |             | 0.0%   | 0                    | Closed           | 0        | 0       |
|             |  | 100.0%      | 100.0% |                      |                  | 221      | 334,556 |

| Items | AGE of BRIDGES | (Items 27, 106) | YEAR (built or rehab) | COUNT |        |
|-------|----------------|-----------------|-----------------------|-------|--------|
|       |                |                 | -1900                 | 0     | 0.0%   |
|       |                |                 | 1901-1910             | 0     | 0.0%   |
|       |                |                 | 1911-1920             | 0     | 0.0%   |
|       |                |                 | 1921-1930             | 1     | 0.5%   |
|       |                |                 | 1931-1940             | 2     | 0.9%   |
|       |                |                 | 1941-1950             | 0     | 0.0%   |
|       |                |                 | 1951-1960             | 2     | 0.9%   |
|       |                |                 | 1961-1970             | 7     | 3.2%   |
|       |                |                 | 1971-1980             | 18    | 8.1%   |
|       |                |                 | 1981-1990             | 37    | 16.7%  |
|       |                |                 | 1991-2000             | 76    | 34.2%  |
|       |                |                 | 2001-2010             | 56    | 25.2%  |
|       |                |                 | 2011-2020             | 23    | 10.4%  |
|       |                |                 |                       | 222   | 100.0% |

|      |   |
|------|---|
| (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%      | N/A        |
| BIM - 18 months            | 0            | 100.0%      | N/A        |

**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 | % COMPLIA NT | 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 |
| <b>Culvert Span*</b>                             |              |                        |
| unusually long steel culvert spans               | 0            | depends on sample size |
| <b>Location</b>                                  |              |                        |
| Item 9 Location                                  | 4            | 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 (Adherin
- (NC) Not Compliant

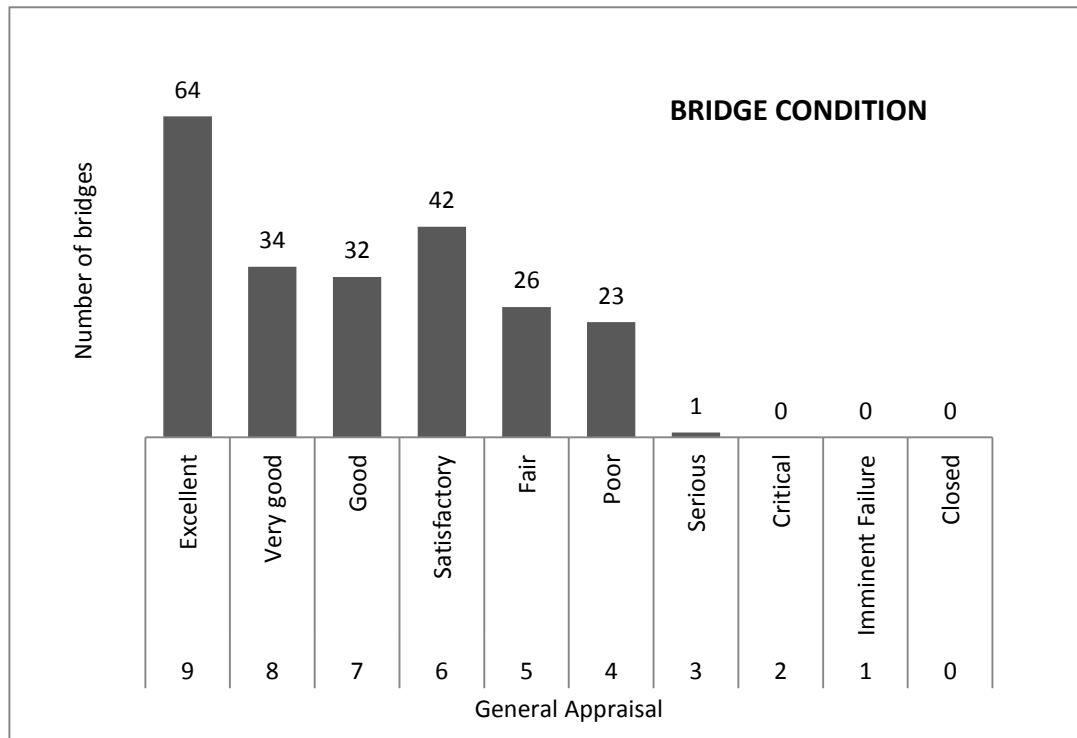
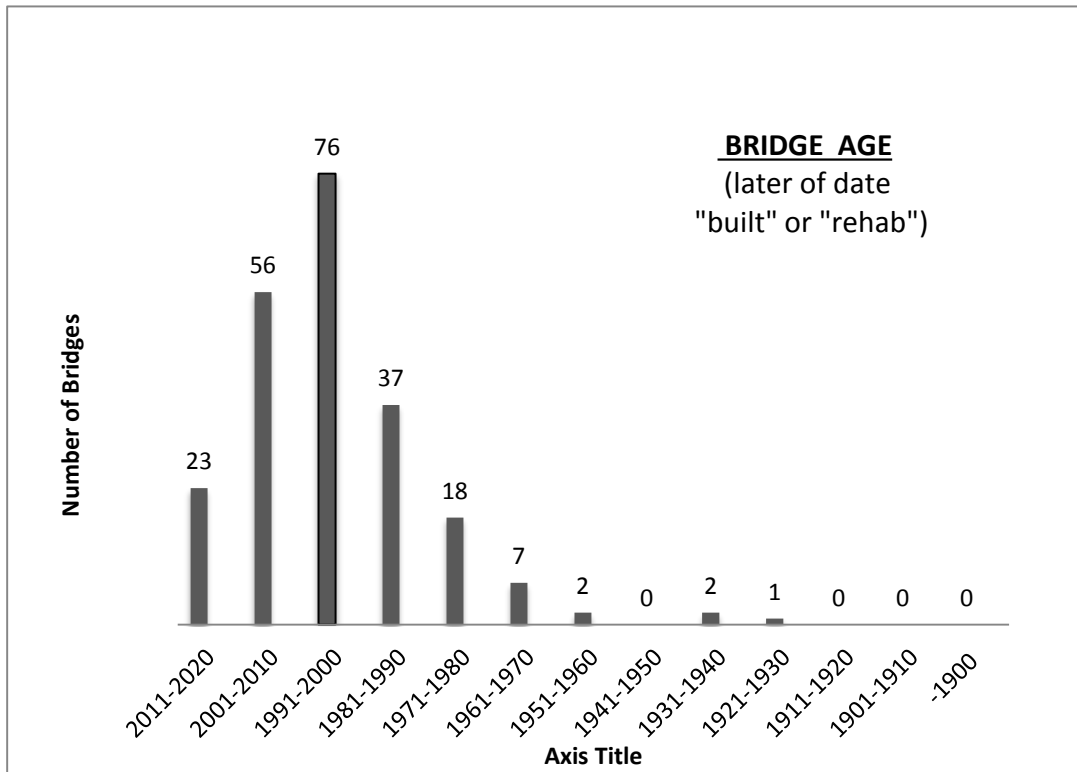
| Metric | Description                              | (C) | (SC) | (CC) | (NC) |
|--------|--|-----|------|------|------|
| 1      | State Bridge Inspection Organization     |     |      |      |      |
| 2      | Program Manager Qualification            |     |      |      |      |
| 3      | Team Leader 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 ** 95%                         |     |      |      |      |
| 23     | Updating of Data                         |     |      |      |      |

\*\* based on results of Field Review

| Metric | Action Needed |
|--------|---------------|
|        |               |

## AGE VS. CONDITION

Overall Shape of AGE and CONDITION graphs typically mirror each other





## GENERAL APPRAISAL COMPARISON

