



# National Bridge Inspection Program Update

FHWA ILLINOIS DIVISION

2019

## ILLINOIS BRIDGE INVENTORY

- Total No. of Bridges = 26,791**  
State: 7,849  
Local: 18,942
- Average Age**  
State: 44 yrs.  
Local: 41 yrs.
- Load Posted**  
State: 82  
Local: 826
- Fracture Critical**  
State: 174  
Local: 318
- Scour Critical**  
State: 22  
Local: 87
- Percent Poor by Deck Area**  
2019: 12.3%  
2018: 11.6%  
2017: 10.6%

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## Federal Oversight of the NBIP

Each year, the Federal Highway Administration (FHWA) completes an annual assessment of Illinois' bridge inspection program. This effort evaluates Illinois' compliance with the [National Bridge Inspection Standards \(NBIS\)](#) regulation, which sets the requirements for all state bridge inspection programs.

In addition to the NBIS, the FHWA also published the "[Metrics for the Oversight of the National Bridge Inspection Program](#)", a policy that provides 23 metrics for FHWA to evaluate each year. The FHWA Illinois division office must assess each of the 23 metrics at either a minimum, intermediate, or in-depth level review each year.

**Minimum** - Basic, uses the previous year's review results for comparison. Typically, there are no sampling requirements.

**Intermediate** - Usually involves bridge file or field sampling. Required at least once every 5 years for each metric.

**In-Depth** - Very focused review, sometimes a national emphasis required by FHWA Headquarters office. More Sampling.

During the Illinois Performance Year (PY) 2019 review, covering Jan 2018 - Dec 2018, 14 metrics were reviewed at the at minimum assessment level, the remaining 9 were Intermediate level.

Based on the findings for each metric, there are 4 possible compliance determinations; Compliant, Substantial Compliance, Conditional Compliance, and Non-Compliance.

**Compliance** - All criteria from NBI Regulations are met.

**Substantial Compliance** - Most criteria from the NBI Regulation are met but minor deficiencies exist

**Non-Compliance** - Significant criteria or multiple criteria from the NBI are not met.

**Conditional Compliance** - The State is adhering to an FHWA approved plan of corrective action (PCA).



It is important to note that owners/districts are not assessed individually during FHWA's review. The metrics assessment is essentially an all or nothing effort, with very little tolerance for errors. For example, if a single bridge inspection is over 4 months late, the metric will be found Non-Compliant for the entire state. This is why it is especially important that each owner is aware of the NBIS and how their program affects the state's overall performance.

As Illinois' infrastructure continues to age it is becoming more and more critical to perform thorough and timely bridge inspection to help ensure the safety of the travel-

ing public. The knowledge, experience, enthusiasm, and training of bridge inspectors and delegated program managers are vital components of the bridge inspection program.

FHWA will continue the NBIS metric assessment annually, with a goal of reaching full compliance on all 23 metrics. An annual summary report is produced each year to document the review; the report is shared with the IDOT Bureau of Bridges and Structures (BBS).

FHWA is available for questions or comments you may have. FHWA also evaluates new ideas to improve the inspection program: this is especially true as standards evolve, equipment improves, and new technologies become available.

In summary, the main purpose of the NBIS program is to improve States' bridge inspections programs while ensuring consistency across the nation. The NBIS requirements can be difficult to attain but the reality is that these metrics ensure public safety and should be addressed with the utmost care.

Federal regulations, requirements, and guidance, as well as other helpful information can be viewed at: <https://www.fhwa.dot.gov/bridge/nbis.cfm>

Sincerely,

Dan Brydl, Division Bridge Engineer

Curtiss Robinson, Assistant Bridge Engineer

## Primary Performance Findings - 2019

Illinois continues to make improvement towards full compliance with NBIS requirements. A summary of the top four findings and implementation are presented below. For more information, please contact Tim Armbrecht, BBS.

	I.	II.	III.	IV.
<b>FINDING</b>	<b>Inspections lack proper documentation for assigned condition ratings.</b>	<b>Channel cross-sections are not developed for all bridges over waterways.</b>	<b>Fracture Critical Mem. (FCM) Inspection procedures not developed for all FCM bridges</b>	<b>Bridges are inspected late with no justification or no pre-approval for the delinquency</b>
<b>IMPLEMENTATION</b>	When primary condition rating is ≤5, notes are required that identify the defect and justify the rating.	All bridges over waterways require submittal of the channel cross-section during the next active inspection.	All bridges with FCM require submittal of an electronic copy of the FCM Inspection plan to the BBS.	Requests should be made for any bridge that will have a delayed inspection. FHWA must approve any delays.

# Special Bridge Details

In February 2019, the Northbound Lake Shore Drive bridge over the Chicago River (Cook County) had a dapped steel connection failure that resulted 5-day closure. (More info [here](#)). This failure was heavily publicized by the media and led to an NBI Subscription Service announcement by IDOT which recommended action.

This failure should serve as a reminder for all bridge inspectors to pay special attention to non-typical details in critical locations. Please continue to stay on the lookout for unusual details, and continue to monitor previously identified details on your upcoming inspections.

Here are a few tips when you come across unique details:

1. **Get a good look.** Get up close, even if it means using additional access equipment.
2. **Always take photos!** Recommended for every inspection. Great tool for monitoring defects and sending to IDOT for recommendations.
3. **Use NDT.** There are several low cost, relatively fast tests to check for defects that would otherwise not be detectable.
4. **Report.** Report fatigue cracks immediately: this type of defect can result in sudden failure if not properly addressed.
5. **Get the condition rating correct.** Follow proper procedures and take measurements.
6. **Request help.** The IDOT BBS is available and willing to assist.



# Critical Findings

In 2018, over 50 critical findings were reported across the state of Illinois. Common critical findings in Illinois include: Steel and Timber pile deterioration, advanced section loss in superstructure members, and bridge impact damage.

FHWA defines a **Critical finding** - *A structural or safety related deficiency that requires immediate follow-up inspection or action.*

FHWA requires that all critical findings are reported within 24-hours of discovery. Program Managers shall immediately contact the IDOT District Local Bridge Liaison

and BBS Local Bridge Unit with photographs and description of the critical element.

### 3 Considerations for Critical Findings

1. Applicable to ALL bridges, not just Fracture or Scour Critical bridges.
2. Bridges in good/fair primary CAN have a critical finding. (<2 condition rating triggers a potential critical finding automatically).
3. Must be reported immediately. When in doubt contact the BBS for assistance.

### Areas to take a closer look...

- Pay extra attention to **piles**, especially at the waterline/mudline, but also **under caps**.
- Look for excessive section loss (greater than 10% in critical areas), especially near **joints**.
- **Special/Unusual details.**
- Elements susceptible to **impact damage**.

IDOT hopes to improve critical finding reporting throughout Illinois and has developed a short training video on the critical finding process.

**Everyone is highly encouraged to watch this short video!**

[Click here to watch it!](#)



# Channel Cross-Sections

During the PY19 NBIP File Review for Metric 15, it was discovered that most structures over waterways do not have channel cross-sections documented.

For structures over waterways, per Structural Services Manual Section 3.3.3.1, "Channel cross-sections shall be taken along the upstream and downstream fascias for comparison with Initial Inspection baseline cross-sections at a

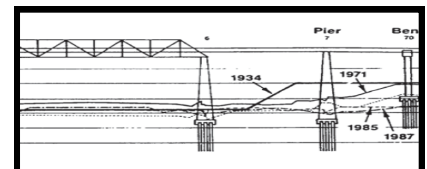
maximum interval of every 5 years and after significant storm events..."

Taking channel cross-sections on a regular interval provides bridge owners a tool for monitoring the following:

- Channel Migration
- Aggradation/Degradation
- Scour

If you do not have channel cross-sections complete, we suggest that they be completed during the next routine inspection.

\*In addition, please also consider use of IDOT's *Channel Cross Section Measurement Record* form.

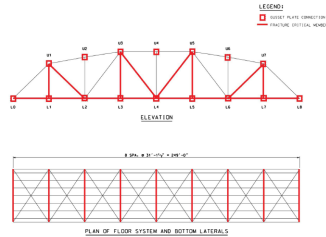


# Inspection Procedures - FC & UW

Written inspection procedures, specific for each bridge, are required for all Underwater (UW), Fracture Critical Member (FCM), and Complex (Moveable, Cable-Stayed, Suspension) bridge inspections. In recent reviews, it was found that there are still owners that do not have procedures developed for these inspection types. IDOT has developed forms and templates to assist bridge owners with developing these procedures.

1. IDOT Form BBS UIP, **Underwater Inspection Plan**, must be developed for all bridges requiring an underwater inspection, in addition to required cross sections, etc.

2. A **Fracture Critical Member Inspection Plan** must be developed for all bridges with Fracture Critical members. A template can be found in the Structural Services Manual.



Here are some important points to consider regarding inspection procedures:

- The intent is to communicate specific items (special procedures, access equipment, problematic details, etc.) to the Team Leader ahead of time to ensure a quality inspection.
- The *inspection report* documents what an inspector found. Inspection procedures lay out what should be done, which ensures consistency.
- Inspection procedures describe unique risk factors for the bridge.

The next important step is to inspect each bridge according to those procedures, and to properly document those actions in the report!

Please be sure to **check your inventory** to be certain these requirements are met.

## Inspection Documentation

Proper documentation is a critical component of a high quality bridge inspection.

In 2016, IDOT developed a short training video on proper bridge inspection documentation to increase quality and consistency throughout Illinois.

[Click here to watch it!](#)

**Remember to always...**

1. Document all defects by providing description, size, severity, and location of deficiencies. Written descriptions are required for all primary condition ratings of "5" or less.
2. Include enough information on each

report to assess the change of condition over time.

3. Don't rely on pending Load Rating inspections to provide the detailed documentation of deficiencies.

In addition to inspection notes, bridge files should also contain significant correspondence.

The AASHTO Manual for Bridge Evaluation, Section 2.2.3 states:

*"...all pertinent letters, memoranda, notices of project completion, daily log during construction, telephone memos, and all other related information directly concerning the bridge in chronological order in the bridge record."*

More is better when it comes to bridge inspection documentation. Detailed recording and monitoring of bridge deterioration provides IDOT the information needed to maintain Illinois' inventory. As IDOT continues to develop their asset management plan, the department will continue to rely on inspection documentation more heavily for future programming/planning.

\*Starting in 2019, the Illinois Structure Information System (ISIS) will no longer allow submission of blank inspection notes for primary condition ratings of "5" or less. Please work with your District Bridge Liaison for more information regarding this change.

## Timely Posting/Closures

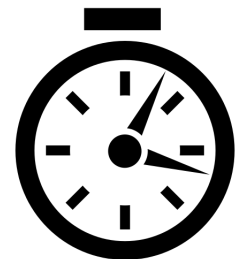
Due to a recent memorandum released by FHWA regarding bridge posting & closures, IDOT has revisited their bridge load posting and closure policy/practices to ensure they meet all federal requirements.

The NBIS does not identify timeframes for load posting bridges but FHWA has now set the requirement that bridges requiring load posting must be posted as soon as possible, but no later than 30 days.

IDOT had already set a 30 day requirement in their own policy regarding timely postings & closures, so there are no major changes anticipated; however, it is critical that all posting and closures adhere to these policies.

When required, IDOT retains the authority to post/close local structures if owners are unable to meet the 30 day requirement. Owners will then be provided an invoice for the services provided.

In short - Please make every effort to post/close structures as soon as possible. Federal requirements are tightening up, mostly in effort to ensure public safety, which remains a top priority. Technological advances in construction and communication continue to accelerate, as should our ability to quickly post and close structures.



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**“Working with Our Partners to  
Improve Bridge Safety in  
Illinois, and the Nation”**

## Inspection Delinquencies

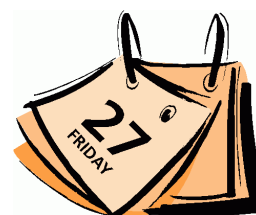
Complying with **designated bridge inspection intervals** remains an important and highly visible aspect of the bridge inspection program.

Although very significant improvements have been made in the recent past, our continued goal is to ensure every single bridge is inspected on time. As you know, **occasional** minor delinquencies are allowed (up to one month) as long as there are well documented and acceptable reasons for those delinquencies. **It is extremely important to report those reasons as required.**

As you know, even one bridge in the entire state of Illinois that is delinquent for inspection by 4 months or more is grounds for a non-compliance determination for the entire state. **Every effort should be made to avoid delinquencies.**

The Bureau of Bridges and Structures has a inspection crews on standby to inspect any bridge that looks like it might become at least four months delinquent. Upon completion of the inspections, invoices will be sent to any owner to cover the costs of this inspection.

**A final reminder for bridge owners:** please continue to use the Inspection Date Notification (IDN) system to document when inspections are completed so that the Bridge Management Unit can accurately track inspection progress.



## Resources for Local Public Agencies

A comprehensive overview of the National Bridge Inspection Program (NBIP) is located on the FHWA website at the following link: <https://www.fhwa.dot.gov/federal-aidessentials/catmod.cfm?id=87>. This module is one of several training modules designed to help Local agency professionals navigate the NBIP. The site is structured for busy agency staff who want further understanding of Federal policies, procedures, and practices. You will find quick answers, straight to the point, and presented in plain language to help you make the right decisions in successfully complying with the NBIS. The Federal-aid Essentials Web site also contains a resource library of informational videos regarding the Federal-aid Highway Program.

Other FHWA resources pertaining to the NBIS, including inspection manuals, policy and guidance, etc. is located on the FHWA website at the following link: <https://www.fhwa.dot.gov/bridge/nbis.cfm>

In addition, the IDOT Bureau of Bridges and Structures website contains the resources required to properly administer a Local Agency Bridge Inspection Program. The Bridge Management and Inspection Unit within the Bureau of Bridges and Structures oversees the Illinois Bridge Inspection Program. The Bridge Management and Inspection Unit website, located at the following link:

<http://www.idot.illinois.gov/doing-business/procurements/engineering-architectural-professional-services/Consultants-Resources/bridge-management-and-inspections>, contains tabs for Resources; Training; Webinars and Videos; Forms and NBI Subscription Service Announcement Archives. Below are examples of the information available.

Resources

- \* Current IDOT *Structural Services Manual*, which contains Official IDOT Bridge Inspection Policy
- \* Current IDOT *Structure Information and Procedure Manual*
- \* Illinois Certified NBIS Program Managers and Team Leaders
- \* Structure Information Management System (SIMS) databases

Training

- \* Current Bridge Inspection Courses hosted/ provided by IDOT

Webinars and Videos

- \* Calculating Section Loss in Steel Members
- \* Completing IDOT Inspection Forms
- \* Critical Finding Process

Forms

- \* All Forms related to Bridge Management and Inspection
- NBI Subscription Service Announcement Archives
- \* Archives from 11/15/2013 to Present

In order to have the most up to date IDOT Policy, updates to the NBIS, revisions to IDOT Manuals and Forms, and other information related to the NBIP, subscribe to the IDOT Bureau of Bridges and Structures NBI Subscription Service by sending a blank e-mail to the following: [subscribe-dot-nbi@lists.illinois.gov](mailto:subscribe-dot-nbi@lists.illinois.gov)

The Bridge Management and Inspection Unit can also be contacted at the following email address: [DOT.BBS.BridgeMgmt@illinois.gov](mailto:DOT.BBS.BridgeMgmt@illinois.gov)

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