

NBIS MAINTENANCE INSPECTIONS

ILLINOIS DEPARTMENT OF TRANSPORTATION

All bridges with an opening of 6.1 meters (20.1 feet) or more, face to face of abutments, on roads open to public travel, will receive a Safety Inspection in accordance with the National Bridge Inspection Standards (NBIS). Coding of inventory and inspection items is according to the guidelines of the Illinois Structure Information System (ISIS) as indicated in the Structure Information and Procedure (SIP) Manual. The results will be recorded on the Illinois "Bridge Inspection Report", form BM-BIR. The BM-BIR will be kept on file by the agency responsible for inspection. For structures not maintained by IDOT, inspection results in the form of numerical condition and appraisal ratings will be reported to the District on the Inspection/Appraisal Report (R104). These forms are available from the District Office.

Inspection Interval

The NBIS inspection will be performed at intervals not to exceed two years except for structures meeting criteria allowing a four year interval. The criteria is as follows:

- Structures with Material and/or Type as follows must continue to be inspected at a 24-month interval:

<i>ITEM 43</i>	<i>MATERIAL</i>	<i>TYPE</i>
x03		Deck Girder
x08	All	Orthotropic Deck
x09	All	Deck Truss
x10	All	Thru & Pony Truss
x12	All	Thru Arch
x13	All	Suspension
x14	All	Stayed Girder
x15-x17	All	Movable
x24	All	Thru Girder
x28	All	Segmental Box Girder
x30 -x70	All	Specific Truss Types
x00	All	Other
8xx	Masonry	All
9xx	Aluminum, Wrought Iron, Cast Iron	All
0xx	Other or Varied	
311	Steel	Deck Arch
319	Steel	Culvert

- The condition appraisal for Deck, Superstructure and Substructure, or Culvert must be "7" or greater.
- The structure must be capable of carrying Illinois legal loads at the inventory (design) stress level. (Inventory Rating = HS18 or greater for bridges or HS15 or greater for concrete culverts under fill). Eligible structures must not require any legal load restrictions.
- Vertical clearance, over or under, must be 14'-0" or greater.
- The longest span in an eligible structure may not be over 100 feet.
- Bridges will not be considered for the 48-month NBIS inspection cycle immediately following construction, reconstruction, rehabilitation, or major repairs. Only after a Routine NBIS Inspection is performed on the normal 24-month cycle may a bridge qualify for the 48-month cycle. This inspection must be performed at least 12 months after the construction activity.
- All structures must have had one NBIS inspection since January 1, 1994.
- Annual Average Daily Traffic (AADT) must be 30,000 or less and Average Daily Truck Traffic (ADTT) must be 3000 or less (except culverts under two (2) feet or more of fill).

- The age of the structure may not exceed 50 years unless it has been reconstructed within the past 30 years.
- All structural members must possess load path redundancy; i.e. no truss or two girder type structures, tied arches, cable stayed, suspension, etc.
- The Scour Critical Analysis Rating must be "5" or higher.
- The bridge may not be on the list of Defense Highway Critical Facilities as indicated by an asterisk in the last, or 20th, field position of ISIS Item 6, Feature Crossed.
- The bridge may not be under the primary maintenance responsibility of a Federal agency.

Bridges with repair histories that indicate a strong probability of future problems should not be included among the candidates for the 4-year NBIS inspection interval. Such a determination may be made at the discretion of the individual with maintenance responsibility for any structures that otherwise fall under the eligibility guidelines. Experience with the types of structures meeting the eligibility criteria on both state and local systems gives no reason to expect such problems.

The eligibility of each structure will be reviewed following any revision of applicable inventory and inspection data. Any formerly eligible structures which no longer meet the inspection interval extension criteria will revert to a maximum 2-year interval.

The four-year inspection interval is optional, representing a *maximum* in no way precluding inspections at lesser intervals. Structures that are eligible for the 4-year NBIS inspection interval may, at the discretion of the agency with jurisdictional responsibility, be inspected at lesser intervals. Any such inspections will be entered into the ISIS by the Department. The maximum inspection interval will be kept at two years when a local agency informs the Department in writing that it wants all of its structures excluded from consideration for a four-year interval even though they may otherwise qualify.

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Inspection Interval

The Routine NBIS Inspection will be performed at intervals not to exceed two years except for structures meeting criteria allowing a four-year interval. This criteria is described in that which follows.

The Federal Register dated October 12, 1993 provides a final rule which allows an increase in inspection intervals to a maximum of four-years for certain groups of structures. The inspection interval could be increased for certain types or groups of bridges where past inspection reports and favorable experience and analysis justifies the increased interval of inspection. *The purpose of this provision is to allow bridge inspectors to spend more of their inspection time on critical or problem structures and focus more of their efforts on major deterioration, fracture critical details, underwater inspections and scour critical bridges.*

FHWA Technical Advisory T 5140.21 dated September 16, 1988 addresses this increase in inspection interval for certain groups of bridges and provides guidance for identifying candidate structures that could be approved for inspection intervals of up to four-years. This Technical Advisory guidance applies to routine inspection only. All requirements relating to special inspections, such as underwater inspections or emergency scour inspection during floods, remain applicable.

In accordance with the Technical Advisory, we have developed criteria for selecting structures to be put on a four-year inspection interval. The four-year inspection interval is optional, representing a *maximum* in no way precluding inspections at lesser intervals. Structures that are eligible for the 4-year NBIS inspection interval may, at the discretion of the agency with jurisdictional responsibility, be inspected at lesser intervals. Any such inspections will be entered into the ISIS by the Department. However, the maximum inspection interval will be kept at two years when a local agency informs the Department in writing that it wants all of its structures excluded from consideration for a four-year interval even though they may otherwise qualify. The four-year inspection interval criteria is as follows:

1. Structure Condition and Appraisal Ratings

The NBI condition ratings for the candidate structures must be coded "7" or greater (or "N") for the following items:

- Item 58 - Deck
- Item 59 - Superstructure
- Item 60 - Substructure
- Item 62 - Culvert

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This criteria is more stringent than that suggested in the Technical Advisory which states that the selected condition ratings must be “6” or greater. We believe that this is the critical controlling criteria for the four-year inspection interval. A rating of “7” means that the particular item is in “Good Condition”. Experience has shown that structures with condition ratings this high do not have problems and maintenance requirements are very minimal. In addition, it is extremely unlikely, within a period of four-years, that any structure in such condition would deteriorate to a point where its structural capacity is affected, even under the most severe environmental and loading conditions.

2. Structure Type

We have excluded trusses, non-redundant girder type structures, tied arches, cable stayed, suspension, single box bridges and other unique structures from consideration for inspection interval extension. No structures containing fracture critical members or otherwise without load path redundancy may have a Routine NBIS Inspection greater than two years. Structure Material and/or Type codings and descriptions as recorded in the ISIS which are *excluded* from consideration for an extended inspection interval are presented in the following table:

TABLE OF STRUCTURE MATERIALS & TYPES EXCLUDED FROM CONSIDERATION FOR 4-YEAR NBIS INSPECTION INTERVAL			
ITEM 43			
IDOT	FHWA	ISIS MATERIAL	ISIS TYPE
_03	_03	All	Deck Girder
_08	_08	All	Orthotropic Deck
_09	_09	All	Deck Truss
_10	_10	All	Thru & Pony Truss
_12	_12	All	Thru Arch
_13	_13	All	Suspension
_14	_14	All	Stayed Girder
_15-17	_15-17	All	Movable
_24	_00	All	Thru Girder
_28	_21	All	Segmental Box Girder
_30 - 70	_10	All	Specific Truss Types
_00	_00	All	Other
8__	8__	Masonry	All
9__	9__	Aluminum,Wrought Iron, Cast Iron	All
0__	0__	Other or Varied	All
311	311	Steel	Deck Arch
319	319	Steel	Culvert

3. Load Capacity

To qualify for a four-year inspection interval, a structure must be capable of carrying Illinois legal loads at the inventory (design) stress level. Therefore, the Inventory Rating (Item 66) must

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be HS 18.0 or greater for bridges or HS 15.0 or greater for concrete culverts under fill. The Inventory Rating for culverts under fill is allowed to be lower since the fill material will help distribute loads. An eligible structure must not have a weight limit posting or otherwise be restricted to legal loads only. i.e. Bridge Posting Level (Item 70) must be coded "5".

4. Vertical Clearance

Structures with a high susceptibility to vehicular impact damage will not be eligible for the four-year inspection interval. Vertical clearance, over or under (indicated by Items 53A/B or 54B1/B2), must be 14' -0" or greater. A structure which fits this criteria but is known to have a history of repeated vehicular impact damage, will be removed from the list of structures eligible for a four-year inspection cycle.

5. Length of Longest Span

Length of Longest Span (Item 48) must be 100 feet or less for a structure to be eligible for a four-year inspection interval.

6. Average Annual Daily Traffic and Average Daily Truck Traffic

Average Annual Daily Traffic (AADT) is limited to 30,000 and the Average Daily Truck Traffic (ADTT) is limited to 3,000 for eligible structures except for culverts under two (2) feet or more of fill. These values were chosen to account for factors affecting fatigue related distress in addition to the criteria for structure material and type. Fatigue prone structures are not candidates for increased inspection intervals.

7. Age and Rehabilitation Considerations

A structure over 50 years old will not be eligible for the increased inspection interval unless it has been reconstructed or had a major rehabilitation within the previous 30 years.

Bridges will not be considered for the 48-month NBIS inspection cycle immediately following construction, reconstruction, rehabilitation, or major repairs. Only after a Routine NBIS Inspection is performed on the normal 24-month cycle may a bridge qualify for the 48-month cycle. This inspection must be performed at least 12 months after the construction activity. It was determined that after a structure is built and for two or three years after, distress due to construction problems, settlement and design flaws will show up and be corrected as necessary. At that time the structure will be placed in the four-year inspection category provided all other criteria are satisfied.

8. Base-line Inspection

Existing structures that are to be considered for a four-year inspection interval must have had at least one NBIS inspection after January 1, 1994. This criteria is provided to ensure that all candidate structures have a base-line inspection from which all other criteria provided in this policy can be reviewed and evaluated. This will enable inspectors to evaluate the structure with current inspection information so that the structure is not placed into the four-year category using inspection criteria that may have become obsolete due to possible changes in IDOT NBIS inspection policies.

9. Scour Susceptibility

For a structure to be eligible for the four-year inspection interval, Scour Critical Analysis Rating (Item 113), must be coded "5" or higher. This requirement will eliminate any structures that are classified as being scour critical or otherwise requiring annual monitoring for scour. In addition, if any candidate structure is subjected to unusual flooding, an inspection will be made

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immediately and the inspection interval may be adjusted as recommended to the Bureau of Bridges and Structures by the individual responsible for maintenance.

10. Critical Facilities

A candidate structure may not be on the list of Defense Highway Critical Facilities as indicated by an asterisk in the last, or 20th, field position of Feature Crossed (Item 6). This eliminates any structures on a designated defense highway that is considered to be a critical facility.

11. Federal Agency Structures

A candidate structure may not be the principal maintenance responsibility of any Federal Agency. Such structures are indicated in the ISIS by a Maintenance Responsibility (Item 21) coded "0" in the first position with "5", "F", "G" or "H" in the second, or by any of these codes in the first position. The Federal coding for these structures would be "62" through "70".

12. Inspection Interval Re-evaluation

The inspection interval of all NBIS bridges will be re-evaluated annually. If conditions have changed to a point where all of the criteria provided above are not satisfied, the inspection interval will automatically be revised to not exceed two years. Individuals responsible for maintenance may recommend to the Bureau of Bridges and Structures that the inspection interval be reduced to or kept at two years or less for any structures that otherwise fall under the eligibility guidelines if extenuating circumstances exist. One example of this is a history of repeated vehicular impact damage.

13. Overloads

Significant frequency of use by permit overloads is directly related to the ADTT. The ADTT restriction on candidate structures precludes the occurrence of an unacceptably high volume of overloads.

14. Repair History

Bridges with repair histories that indicate a strong probability of future problems will not be included among the candidates for the four-year NBIS inspection interval. Such a determination will be made at the discretion of the individual responsible for maintenance for any structures that otherwise fall under the eligibility guidelines. Experience on both the state and local systems gives no reason to expect such problems among structures meeting the eligibility criteria.