

Local Bridge Improvement Program Application NBI Score Table and Definitions

The LBIP application score has a cumulative total of 100 points maximum. This is a combination of 55 points for Regional Score and 45 points for the NBI score. The NBI Score that is listed with each eligible Poor bridge is the assigned value based on information collected by bridge inspection for each individual structure. All bridges included on the Poor eligibility list are in need of replacement or at minimum require a major rehabilitation, and this creates difficulty in selecting between the individual projects. The intent of this "NBI" score is to give counties or regions a fair comparative measure or score that can assist in determining Higher or Lower priority projects.

As previously stated, the NBI Score has a maximum value of 45 points, the higher the score the higher priority or perceived value of the project. It is based simply on structural components and structural condition ratings and measures as shown in the table below. Also, it was determined that additional points should be added to each county based on the percentage of Poor Square Footage of deck area in each separate region. The Poor Sq. Ft. points is a regional measure and does not affect the statewide comparison.

The published NBI Score for each structure already includes the Poor Sq. Ft. regional points. A maximum of 5 points are allowed for each county structure, but cannot adjust the NBI Score above the 45 maximum point cap. The stand-alone Regional scoring measures allows for the more subjective needs within each region. These potential 55 points have a sufficient impact to temper the NBI score even with the included Poor Sq. Ft. points. For example, the highest NBI score statewide is 41 points even with the inclusion of the max 5 points for Poor Sq. Ft. for that region.

NBI Score Table

Item	Potential NBI Score		
1	Poor List Eligible	Base Points	10
2	Fracture Critical	Inspection Required	pts 7
3	Poor 4-Deck	Poor Rating	pts 2
4	Poor 4-Super	Poor Rating	pts 4
5	Poor 4-Sub	Poor Rating	pts 4
6	Poor 4-Culvert	Poor Rating	pts 7
7	Scour ≤ 4	Poor Rating	pts 2
8	Timber Pile	Substructure Component	pts 3
9	Water Adq. ≤ 3	Observed Inspection	pt 1
10	Approach Rd ≤ 3	Observed Inspection	pt 1
11	Over RR	Feature	pt 1
12	Detour Length ≥ 8 miles	Reviewed Measurement	pts 2
13	Appvd Posting ≤ 15 Ton	Load Rating or Condition Rating Total pts 5 Max	pt 1
	Appvd Posting ≤ 5 Ton		pts 2
	Closed		pts 2

Item	Conditional NBI Score		
14	ADT ≥ 100 Outside of MPO Boundary	Observed Inspection	pts 2
		No Points given for MPO	pts -2
15	1 Lane Bridge	Reviewed Measurement	pt 1
		No points for Dead End Roads with ADT below 30	pt -1

Item	Potential NBI Deduction		
16	Low ADT ≤ 10	Observed Inspection	pts -2
17	Year Built	Inventory Reviewed	
		Newer than 25 years	pts -2
		Newer than 10 years	pts -5
	Year Reconstructed not considered	pt	0

Total NBI Score: 10 Base points plus potential 35 Scoring Points = 45 points Maximum Value

Poor Sq. Ft. Formula

$$\frac{\text{Total Sq. Ft. of Poor deck in a County}}{\text{Total Sq. Ft. of Poor deck for that Region}} = \text{Percentage for a County}$$

$$\text{Percentage for a County} \times \text{Number of Counties in that Region with Poor Sq. Ft.} \times 1.5 = \text{Points given up to 5 Total}$$

NBI Score Items and Definition

Item 1. All POOR List Eligible structures receive 10 Base Points: (10 points)

All bridges on the POOR List will receive an initial score of 10 points. This ensures no structure could ever receive a negative score.

Item 2. Fracture Critical: (7 points)

These structures require yearly inspection and add additional cost to the county for this inspection service. Also, these structures are typically old, and have no redundancy of support members based on their design. The rehabilitation and repair for these are costly and generally do not remove load posting or reduce the high cost of FC inspections. Seven points was considered a justifiable score when considering improved safety, reduced long term maintenance expense and the additional required inspections.

Item 3. POOR Deck: (2 Points)

As a separate item, the score for the deck was valued lower because the driving surface could be improved or replaced without the entire replacement cost of the structure, which are more frequently required by the other POOR rating items. For structures which use the deck as part of structural support, additional points will be included with other POOR rating items.

Item 4. POOR Superstructure: (4 Points)

The girders and/or slab reinforced materials are the main components for the structure's capacity, usually controlling the load posting and usually the single most costly item to replace. The repair of deteriorated or failing members can be limited by redundancy of the design of the structure. The score reflects a more complex rehabilitation requirement for safety improvement and likely on par with cost of a replacement structure.

Item 5. POOR Substructure: (4 Points)

The substructure is the foundation of the structure and absorbs capacity loads that are transferred from the superstructure but also must withstand the effects of flooding and scour conditions. The support components of the substructure are sometimes unknown or composed of timber pile due to structure's age. The substructure supports the entire structure and when repairs are not practical, the structure must be replaced or closed.

Item 6. POOR Culvert: (7 Points)

NBI length culverts have a single Poor condition rating item, in comparison, a bridge has 3 potential POOR condition ratings items. The score of 7 indicates the overall condition evaluation of the culvert as a weighted average in lieu of Deck, Substructure and Superstructure. This score generally places culverts in a medium priority in comparison to all structures statewide.

Item 7. SCOUR: (2 Points)

Scour in a scoring context is not an item by itself, but it contributes to the structure's vulnerability to be undermined and cause localized or structural failure. It also can indicate the structure length is not an appropriate length to handle the stream crossing.

Item 8. Timber Pile: (3 Points)

A structure with timber pile may appear to have a stable foundation, but localized deterioration just below the timber surface can greatly diminish the structural capacity of the pile. Increased emphasis on this item and the elevated score are in line with the department's focus to reduce the number of timber piling structures statewide.

Item 9. Waterway Adequacy: (1 Point)

This item is a current inspection appraisal for waterways that overtop a structure and the impact to traffic delays. A point will be added when this inventory item coded is equal to or less than 3. This item is subject to FHWA changes to NBI Inventory process.

Item 10. Approach Roadway Alignment: (1 Point)

This item identifies those bridges with inadequate alignment or sight distance issue for the approach roadway. A bad alignment causes a reduction in speed for traffic to navigate the approaching structure. A point will be added when this inventory item coded is equal to or less than 3. This item is subject to FHWA changes to NBI Inventory process.

Item 11. Over Railroad: (1 Point)

These structures can require additional coordination with the Railroad to complete required bridge inspections. A single point will be added for this reason.

Item 12. Detour Length over 8 Miles: (2 Points)

The additional travel time for the traveling public that would result from an unexpected closure of these bridges is viewed as a significant delay. Two points will be added for structures with 8 or more miles of detour.

Item 13. Approved Posting and Closed Posting: (Maximum 5 Points)

The Load ratings and condition ratings can be impacted or influenced by Superstructure and Substructure condition. Structures with a Load Posting of 15 Tons and down to 6 Tons will receive a single point. Those structures with a Load posting of 5 Tons and below will receive another 2 points for a total of 3 points. All structures closed by the inspection process will receive an additional 2 points for a maximum of 5 points total. Example: 1 point total for 15 Ton and lower, 3 points total for 5 Tons and lower & Closed by inspection will receive 5 points as the maximum.

Item 14. Average Daily Traffic (ADT) of 100 or more: (2 Points)

Outside of an MPO, local structures on roadways with an ADT of 100 or more are considered to have significant traffic in comparison to other local structures. These structures will receive 2 points for this higher-than-average ADT.

Inside of an MPO, a significant number of local structures have an ADT over 100 and this number of structures would simply devalue this measure statewide. No points will be deducted for MPO structure with an ADT below 100, but no additional points will be added for those structures with an ADT 100 and above. This measure will simply not apply to structures within MPO boundaries, because of the availability of other funding sources which exist and adequately address their population.

Item 15. One Lane Bridge: (1 Point)

In general, narrow bridges or 1 lane bridges usually function adequately for Dead End or No Outlet roadways, because of their low ADT and these bridges usually match the roadway width. All remaining 1 lane bridges that are not located on a Dead-End roadway will receive a single point. This 1 point will also be given to Dead end roadways with an ADT of 30 and higher. This is in consideration for neighborhoods with a single access point one lane bridge, since these usually have a higher ADT.

Item 16. Low (ADT): Deduction (-2 Points)

Very low ADT roadways that may only serve a single family or farm can be viewed as lower priority based on this recorded ADT. The Regional score by its function and ability can determine a structure has a significant value or purpose and increase the priority for that project. For statewide consideration, two points will be deducted for this item if it is reported equal or less than 10 ADT.

Item 17. Year Built (AGE): Deduction (-5 Maximum Points)

No Reconstruction dates were considered in this deduction.

POOR eligible listed structures that are less than or equal to 25 years old will receive a 2-point deduction from their NBI score. New structures should be designed and built to provide an expected "service life" for a twenty-five-year period.

POOR eligible listed structures that are less than or equal to 10 years old will receive a 5-point deduction from their NBI score. The Ten-year rule is no longer in place with this new funding, but the department still considers this to be a valuable measure.