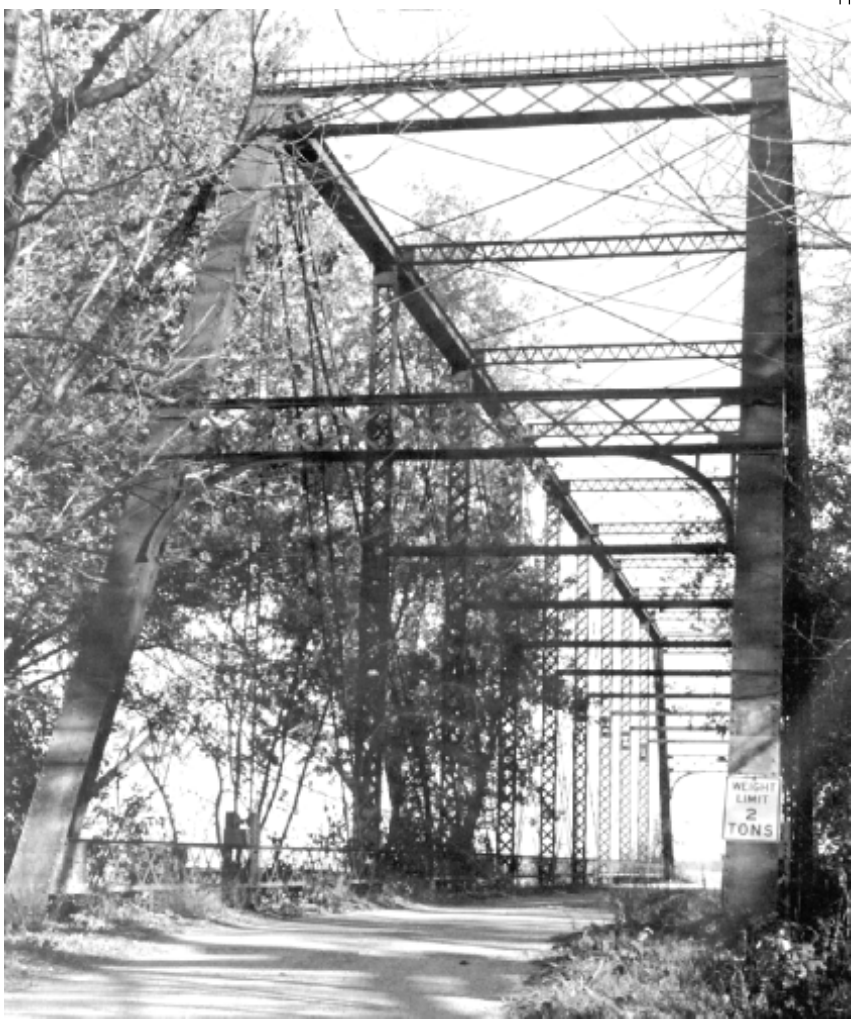
Guidelines for Assessing the Cultural Significance of Indiana's Extant Metal Bridges (1872-1942)



Indiana Department of Natural Resources
Division of Historic Preservation and Archaeology
Revised January, 1999

CATEGORY I: AUTOMATIC CONSIDERATION

Certain metal truss and plate girder bridges can be determined as significant without much ado. Every bridge which falls into at least **ONE** of the following categories will be considered Significant as long as the structure's trusses or load-bearing girders remain essentially intact.

(The decision for significance here overlooks certain structural and contextural dimensions, including the bridge's floor system, its substructure, and its current location)

A All structures designed and erected before 1900.

B All structures containing patented elements.

C All structures for which there are fewer than 18 known extant examples of its truss/girder type within its truss/girder form.

D All structures for which there are fewer than 18 known extant examples of fabrication by a builder.

E All structures already listed on the National Register or determined to be eligible by the DHPA. This includes structures listed as "NRC" in the inventory section of *Iron Monuments to Distant Posterity*. The published assessments follow the advice of the DHPA's Committee on Historic Bridges.

An explanation of the categories follows on the next page.

1) Structures designed and erected in the 19th century are becoming increasingly rare; fewer than 300 are still extant in Indiana. These early bridges are monuments to the growth of transportation in the state, as well as the industrial expansion of the late 19th century. They represent a number of early truss types, such as the Bowstring Arch and the Whipple. They are often built of wrought iron and contain decorative elements not found on later, more utilitarian bridges.

This 1870s Bowstring Arch truss represents the early days of metal bridge construction in Indiana.

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2) Patented elements are important because of their rarity. These include Phoenix columns, tubular arches, and company-held design patents, such as the Indiana Bridge Company's "Plate Leg Girder" and "Cantilever Leg Pony" designs.

The Phoenix Column is an example of a patented element found on some metal truss bridges.

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3) "Truss/Girder type" refers to the truss system used to carry the structure's loads. These include the Pratt, Warren, Camelback, and Parker trusses, as well as Plate Girders and their varients.

"Truss/Girder form" refers to the type of truss used for the bridge. The three Truss/Girder forms are:

--Through truss: the top chords rise above the roadway and connect to each other.

--Pony truss: the top chords rise above the roadway but not as high as a Through truss, and they are not connected to each other.

--Deck truss: the roadway crosses above the top chord

Warren pony trusses (above) are fairly common in Indiana; Warren deck trusses (below) are not. Fewer than 10 Warren decks remain today.

4) As the number of metal bridges declines, more and more structures built by smaller fabricators and out-of-state bridge companies vanish. A bridge constructed by a known builder is uncommon enough; a bridge built by a little-known builder is quite significant. Some rare examples of in-state and out-of-state bridge builders are shown here. In 1987, 25 bridges by these four firms existed in Indiana. Today, there are only 12.

Smith Bridge Company, Toledo OH: 2 remaining

Converse Bridge Company, Chattanooga, TN: 1 remaining

Attica Bridge Company, Attica IN: 6 remaining

Oregonia Bridge Company, Lebanon OH: 3 remaining

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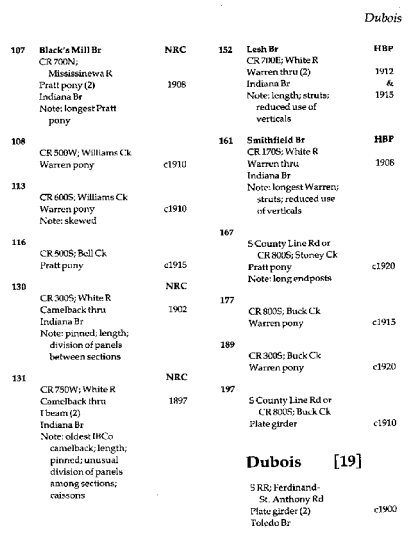
5) The 1987 book *Iron Monuments to Distant Posterity: Indiana's Metal Bridges 1870-1930* by Dr. Jim Cooper was the first published inventory of the state's surviving metal bridges. A Historic Bridge Committee drew up a list of National Register-eligible bridges at that time, and those structures were noted with an "NRC" notation in the book's inventory section.

From time to time, the DHPA reviews additional bridges and declares them to be eligible. This is often done as part of the Section 106 review process.



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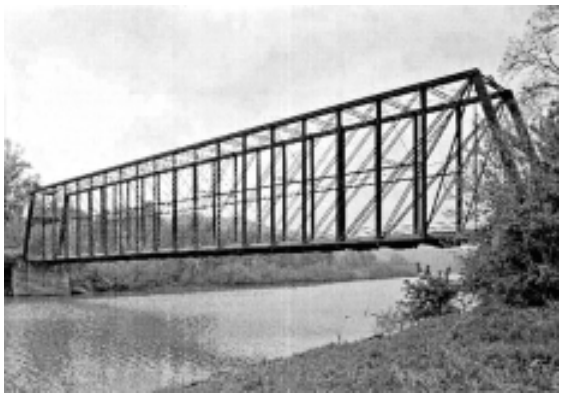
107	**Black's Mill Br** CR 700N; Mississinewa R Pratt pony (2) Indiana Br Note: longest Pratt pony	**NRC** 1908	152	**Lesh Br** CR 700E; White R Warren thru (2) Indiana Br Note: length; struts reduced use of verticals	**HBP** 1912 & 1915
108	CR 500W; Williams Ck Warren pony	c1910	161	**Smithfield Br** CR 1700S; White R Warren thru Indiana Br Note: longest Warren; struts; reduced use of verticals	**HBP** 1908
113	CR 600S; Williams Ck Warren pony Note: skewed	c1910	167	S County Line Rd or CR 800S; Stoney Ck Pratt pony Note: long endposts	c1920
116	CR 500S; Bell Ck Pratt puny	c1915	177	CR 800S; Buck Ck Warren pony	c1915
130	CR 300S; White R Camelback thru Indiana Br Note: pinned; length; division of panels between sections	**NRC** 1902	189	CR 300S; Buck Ck Warren pony	c1920
131	CR 750W; White R Camelback thru I beam (2) Indiana Br Note: oldest IBCo camelback; length; pinned; unusual division of panels among sections; caissons	**NRC** 1897	197	S County Line Rd or CR 800S; Buck Ck Plate girder	c1910

	SRR; Ferdinand-St. Anthony Rd Plate girder (2) Toledo Br	c1900



Laughery Creek Bridge (1878) in Dearborn County

CATEGORY II: POINT SYSTEM OF SIGNIFICANCE

A 20th century metal truss or plate girder bridge that is not automatically determined as Significant under Category I should be determined Significant if the structure score **7** or more on the following scale:

1)	**+4**	for a structure whose trusses or load bearing girders remain essentially intact.
2)	**+1**	for a structure designed and built between 1900 and 1917.
3)	**+1**	for a structure seated on a cut-stone, metal, or timber substructure.
4)	**+1**	for an unusually long or wide span or structure.
5)	**+1**	for a structure built on a skew.
6)	**+1**	for unusual features in structural design.
7)	**+1**	for unusual features in fabrication.
8)	**+1**	for a structure built by an Indiana fabricator.
9)	**+1**	for decorative elements.
10)	**+1**	for a location on an important transportation route.
11)	**+1**	for an unusually important community setting.
12)	**+1**	extant plans or detailed specifications for the structure exist.
13)	**+1**	for a structure for which there are fewer extant examples (of the truss/girder type within the truss/girder form) than there are counties in the region (region defined as the county in which the structure is located and all contiguous counties)

Deductions:

14)	**-1**	substantial repairs to truss/girder members not consistent with original form of fabrication.
15)	**-1**	replacement member not in-kind with original.
16)	**-1**	repairs which have altered or defeated original truss action.

An explanation of the categories follows on the next page.

The guidelines outlined in **II** should be treated as rules-of-thumb which will generally prevail but for which reasonable exceptions may be made. Judgement needs to leaven arbitrarily-approved rules. There may, indeed, be persuasive reasons why a particular bridge which attains 7 points should *not* be determined Significant, and there are surely some cases where a bridge rating below the cutoff ought to be found Significant. Exceptions, however, should be rare enough to prove the exception rather than the rule.

1) Most of Indiana's bridges fall into this category. Only a few bridges have had their trusses seriously modified or damaged. Those that have lose 4 points and nearly all chances of making the 7-point requirement for significance.

This small county bridge's trusses have suffered serious damage.

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2) The years from 1900 to 1917 represent the zenith of Indiana's metal bridge building. Bridges built before 1900 are rare; by 1917 concrete was replacing iron as the material of choice for bridge building. These years also saw many changes in fabrication (all-riveted spans), design (Warren and Parker trusses), and the influence of the automobile (heavier and stronger spans).

Two bridges from the same county: a 1900 Pratt pony (Above) and a 1917 Warren pony (below)

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3) Cut-stone abutments were commonly used on 19th century bridges, but by the 20th century they were becoming rare as concrete abutments became the standard. Metal caissons and piers offered a quick way of supporting a bridge where conditions permitted. Heavy timbers were often used as foundation piling but occasionally they were used to support the entire bridge. Like stone, metal and timber abutments became rare sights in the concrete era.

An example of metal caissons used to support an Indiana bridge.

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4) Unusual size in bridges can vary from type to type, and from state to state. In Indiana, bridges which exceed normal expectations for size are noted in the bridge inventory. These are the bridges which receive a point in this category.

This plate girder viaduct is one of Indiana's longest and highest spans.

5) Fewer than 15% of Indiana's surviving metal bridges are built on a skew or angle. Skewed bridges represented an additional engineering challenge to the designer and are a testament to their skills.

A 1935 Warren through truss built on a 36 degree skew.

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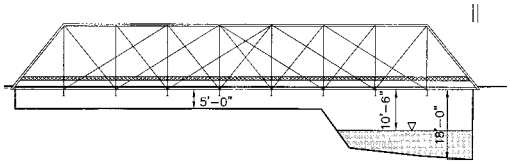
6) Unusual features in design include variations on truss types (hybrids), and modifications made by the engineer or builder that would not normally be found on this type of structure.



Some design variations: a Whipple hybrid (above) and a Warren pony/bedstead combination (below)

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7) Unusual features in fabrication include structural members that are crafted, or are attached to each other, in an unusual way.

This 1916 Parker through truss was field-riveted, a tricky and unusual job for such a long truss.

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8) Bridges that were locally designed and built carry a greater significance to state history than bridges shipped in from somewhere else. Some local bridge builders catered to a relatively small market, while others sold their spans across the country. About 17% of Indiana's surviving metal bridges are known to have been the product of local builders.

The staff and plant of the Rochester Bridge Company of Rochester, Indiana, circa 1910.

9) Decorative elements include portal decoration, finials, decorative nameplates, iron scrollwork, and latticed guardrails.

Decorative elements range from elaborate ironwork (above) to simple finials (left)

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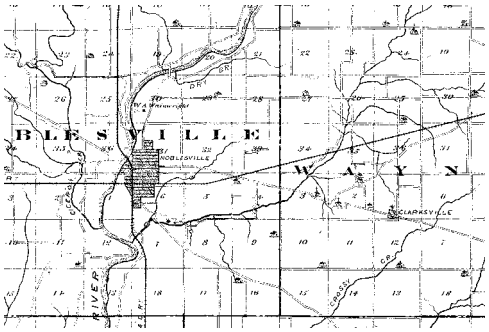
10) An important transportation route can be established in several ways:

—The structure replaced an earlier span at that same crossing. A bridge which replaces a well-used river ford might also be considered an important transportation link.

—The structure was built on a current or former state highway.

—The road on which the structure is located was noted in the *1876 Illustrated Historical Atlas of the State of Indiana*.



Above: The 1876 Indiana State Atlas.
Below: An iron bridge replaces an earlier span at an important transportation site.

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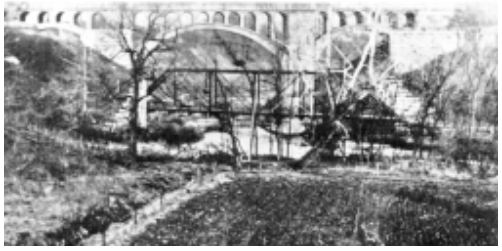
11) Important community setting can be established if:

—The structure is located close enough to be integral to major governmental, religious, educational, or commercial operations.

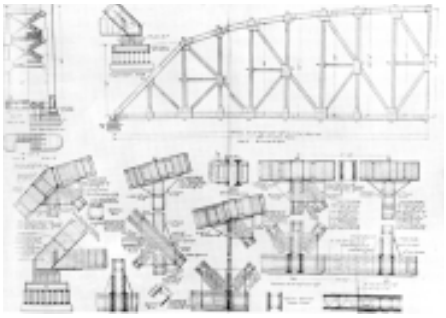
—The structure is the site of a major event or remembrance.

—The structure is the subject of local folklore.



Twin Bridges in Hendricks County are a subject of local folklore.

12) Plans and drawings of bridges add additional documentation to the structure, and give it a greater historic significance. Bridge plans may be kept in a variety of places, including the State Highway Department, local universities, and the State Historical Society. Some bridge builders are still in business and may retain their old plans.



Detailed plans provide historic documentation of a structure and contribute to its significance.

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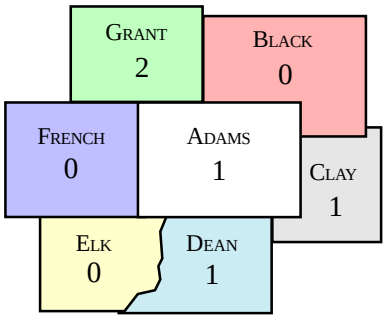
13) This category helps to determine the scarcity of a bridge type in a specific area. For example, if there is 1 Pratt through truss in Adams county (see map, right), and 4 Pratt through trusses in the surrounding counties, there are a total of five Pratt through trusses in the "region". Since there are a total of seven counties in the same "region", a point is awarded to the Adams County Pratt bridge.



Example
Total counties in region: 7
Total bridges in region: 5
(1 point awarded)

Tioga Bridge (1890) in White County, Indiana

Deductions:

Certain characteristics detract from the significance of the bridge and result in the subtraction of points.

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14) Bridge repairs which vary significantly in appearance to the original members would merit the subtraction of a point. Significant evidence of welding repairs and re-connections (as opposed to the original pins, bolts, or rivets) would also be cause for the loss of a point.

Sloppy welding repairs to this bridge make a poor substitute for proper craftsmanship.

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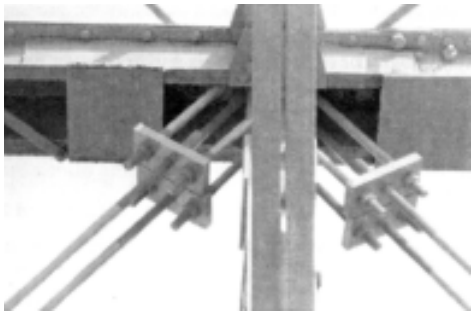
15) Replacement of crafted members with I-beams and other modern versions which look nothing like their original counterparts damage the structure's significance. The replacement of iron members with modern steel is less noticeable, *if* the replacement member is designed to match the original piece.



This bridge has been "repaired" by replacing the diagonals with metal rods.

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16) Occasionally a bridge will be completely modified so that although the original trusses exist, they serve little or no purpose in carrying the loads placed on the bridge. This often happens when I-beams are placed under a truss to boost its load rating.

This Cantilever leg pony bridge was reinforced with a Kingpost arch, reducing the original trusses to little more than guardrails.