



Historic Bridge Foundation Facebook Archives

Did You Know...

...Installing a narrower deck on a bridge for pedestrian use can reduce costs and increase bridge load capacity?

Pedestrian bridges have their load capacity calculated in pounds per square foot (PSF). Under modern guidelines, pedestrian spans are generally designed for 85-95 PSF. This means, for example, that a 100-foot bridge with a 20-foot roadway has an area of 2,000 square feet, and with a live load requirement at 90PSF, it must support 180,000 pounds (90 tons). However, the same bridge with only a 10-foot walkway would have an area of 1,000 square feet and at 90PSF and would only have to support 90,000 pounds (45 tons). In addition, with a narrower deck, the dead load on the bridge would be reduced. Thus, a historic bridge that was incapable of supporting 90PSF at its original width might be better able to handle the load with a narrower deck.

The simplest method of providing a narrow deck is simply to install the narrow deck on the historic bridge with no alterations to the superstructure. This is also the best option in terms of maintaining the historic integrity of the bridge since the overall bridge retains its original dimensions despite the narrow deck. However, in some cases the actual superstructure might be narrowed as well, particularly with relocated bridges where there is a desire to reduce abutment costs by using a narrower bridge. With truss bridges, the process of narrowing a superstructure is easiest and least detrimental to the historic integrity of pony truss bridges, since narrowing a pony truss does not require altering any overhead bracing as is the case with a through truss. However, in both cases, the more a bridge superstructure is narrowed, the greater it changes the feel of the bridge. In contrast, simply placing a narrow deck on a bridge that maintains its original width tends to retain the overall feel of the bridge, and in some cases, the narrow walkway may reveal parts of the bridge for better viewing and interpretation by bridge users.

For the tiny community of Bentonsport, Iowa, the installation of a narrow deck on top of a deteriorated existing deck may have been the only financially feasible option for reopening this bridge to pedestrian use in a community of only 40 residents. In 1994, at a cost of just over \$100,000 (relatively small for a bridge of this size), the 730-foot long through truss bridge dated to 1883 had a walkway added to it with funds raised through donations from foundations and individual plank donors.



The TR-2 Bridge Over Nith River in Oxford County, Ontario is an abandoned highway through truss that had a narrow steel deck installed on it to create a crossing for a rural trail system.



The Bentonsport Bridge in Iowa with its narrow pedestrian deck added on top of the previous vehicular deck.



The Laymon Road Bridge, a historic cast and wrought iron bowstring in Wilmington, Ohio was moved to a park setting and the superstructure was made narrower as part of this relocation.



The Rush's Mill Bridge in Berks County, Pennsylvania is a rare 1869 cast iron Howe pony truss that was narrowed significantly to a 7.5 foot width when it was relocated onto a trail.



Yorktown Park Bridge – The Yorktown Park Bridge in Yorktown, Indiana is a rivet-connected pony truss bridge that was moved onto a trail. The superstructure was narrowed slightly, from 16 to 12 feet as part of the relocation.