

Conclusion

The following summary statements regarding structural characteristics for metal truss bridges, key periods of significance for metal truss bridges in Maryland, and the earliest known documented examples of metal truss bridges in the state are based solely on documentary research.

Metal truss bridges (see Figures 8 through 12 and Plates 5 through 7) comprise two parallel trusses and a floor system supported on a concrete or masonry substructure. Each metal truss consists of individual components connected in a series of triangles. The particular type of metal truss bridge is defined by the arrangement of individual members, and the way in which those members are stressed (compression or tension); a wide variety of configurations is possible, many of which were proprietary, or patented variants, such as the commonly known Pratt and Warren types.

Individual members form the horizontal portions of the truss, called top and bottom chords, and the vertical and diagonal web members. The verticals and diagonals are connected to the top and bottom chords at joints (pin connections or rivet connections are possible). Minor web components may include sub-struts or sub-ties. Members may be in tension or compression, depending on the variety of truss (see Figures 9 through 12).

Other basic components include the portal, stringers, floorbeams, and deck. Portal bracing provides lateral bracing for the two parallel trusses at the top of the end posts. Stringers are longitudinal members which transmit loads to the floorbeams, which in turn transmit loads to the trusses at each panel point (joint connection) where the floor beams, the chord, and the verticals and diagonals are connected.

In addition to proprietary types, metal truss bridges are categorized by the relationship of the roadway to the truss. Simply stated, if the truss system rises above the roadway or deck level but does not include overhead portal bracing, the bridge is termed a pony, or half-through truss. If portal bracing connects the trusses, the span is a through truss. If the truss system is located entirely beneath the deck, the bridge is called a deck truss.

Key periods of significance for metal truss bridges in Maryland, as indicated by documentary research, include *1840-1860*, the transitional period from timber trusses through iron-and-timber structures to all-metal trusses during which early metal truss designs (Pratt, Howe and others) were patented and B&O bridge builders Benjamin Latrobe and Wendell Bollman introduced the Bollman truss (1851); *1860-1900*, the era of metal truss bridge popularization for railroad and highway use, and the movement toward all-steel trusses rather than iron bridges; and *1900-1960*, the period in which metal truss spans for highway use were

increasingly standardized under the impetus of organizations such as the American Society of Civil Engineers, and also the era when the modern metal girder bridge, which could be readily widened, gradually replaced the metal truss bridge for all but monumental spans and their approaches (the 1940 Governor Harry Nice Bridge over the Potomac River, the 1940 Thomas Hatem Bridge over the Susquehanna, the 1952 Chesapeake Bay Bridge, and several western Maryland bridges featuring Wichert truss systems employed combinations of deck trusses and through metal trusses).

The earliest known documented examples of metal truss bridges in Maryland are the nationally significant Bollman Truss Bridge in Savage (1869; moved 1887) and iron bowstring trusses and Pratt trusses in Frederick County dating to the 1870s. Documentation exists that metal truss bridges were employed on the B&O Railroad, Northern Central Railroad, and in Baltimore City during the 1850s and 1860s. As thorough surveys of existing truss bridges in all Maryland counties have not been performed, information about early construction dates for this type of bridge is greatly skewed toward those counties where prior surveys have taken place.

Based solely on prior survey information and research, it appears that the unique Bollman Truss at Savage is the earliest extant metal truss bridge in Maryland and the only surviving example of its type in the United States. Prior survey information similarly indicates that metal truss "firsts" in Maryland may include the Poffenberger Road Bridge over Catoctin Creek, a Double-Intersection Pratt Truss built circa 1878 (MHT F-2-5); the Crum Road Bridge over Israel Creek, a bowstring pony truss built circa 1875 (MHT F-8-2); and the Four Points Bridge over Tom's Creek (MHT F-6-7), a Pratt through truss built in 1876. These conclusions, however, as well as a securely dated chronology of extant early metal truss bridges in Maryland, must necessarily be verified through field survey.

Judging from documentary research, twentieth century developments in metal truss fabrication and use, such as employment of riveted connections rather than pin-connection, are well represented in Maryland. The earliest Wichert trusses known to have been built in Maryland were incorporated into a 1,020-foot-long bridge between Washington County, Maryland, and Shepherdstown, West Virginia, in 1937-1939 by the Maryland State Roads Commission in cooperation with West Virginia authorities.