



Virginia Department of Transportation Historic Bridge Management and Maintenance Plan

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VDOT Historic Bridge Management and Maintenance Plan

55 historic bridges (eligible for the U. S. National Register of Historic Places) have been identified in Virginia.

The Management Plan identified and considered the numerous issues and treatment options relating to historic bridges.



Management Plan Option Categories

Repair and Maintain for Vehicular Use or for Adaptive Use.

Structural Upgrade.

Preventive Maintenance.

Transfer Ownership (On-Site or Off-Site).



Management Plan Option Categories

Discontinue or Abandon.

**Document, Dismantle, and Retain
for Vehicular Use or for Adaptive
Use.**

Document and Demolish.

Management Plan Recommendations

The recommendations in the management plan were adopted by the Virginia State Structure and Bridge Engineer.

Completed projects include several masonry arch bridges and metal trusses. Some representative examples follow:

Appomattox Co. Structure 1002

Single-span reinforced concrete T-beam structure, built 1930, approximately 33 feet (10.06 m.) long.



Appomattox Co. Structure 1002

A commemorative bridge near the Civil War surrender site at Appomattox Court House in Appomattox County.



Appomattox Co. Structure 1002

Has unique concrete decorative elements (stylized Union and Confederate flag motifs, obelisks).



Appomattox Co. Structure 1002

Widened from 30 feet (9.14 m.) to 38 feet (11.58 m.) in 1971 (rails were moved and reused; the end posts/ obelisks were replicated).



Appomattox County Structure 1002

Minor condition issues (some spalling and moisture seepage, minor cracking and delamination, scour); vegetation was encroaching on the bridge.



Recommendations for Appomattox County Structure 1002

Moving, abandoning, or demolition were not recommended. The structure had been widened; an upgrade was not necessary.



Recommendations for Appomattox County Structure 1002

Repair and maintain for vehicular use, with preventive maintenance as needed.



Recommendations for Appomattox County Structure 1002

Remove the asphalt overlay, evaluate/repair the deck, and install a new concrete overlay; clean drains, remove vegetation, repair spalled and delaminated areas, and address the scour problem.



Recommendations for Appomattox County Structure 1002

Transfer of ownership (to the National Park Service) could be a second option if the road is realigned in the future.

Valley Railroad Bridge

**Four-span masonry arch bridge,
former railroad bridge;
approximately 147 feet (44.81 m.)
long.**



Valley Railroad Bridge

Built in 1874; one of Virginia's largest 19th century masonry railroad bridge structures (railroad line was discontinued in 1942).



Valley Railroad Bridge

Preserved as a landscape element in the Interstate 81 right-of-way in Augusta County.





Valley Railroad Bridge

Unsuitable for traffic due to its location within the Interstate 81 right-of-way.

Condition issues included vegetation on the bridge, some areas of seepage through the arch, and corresponding loss of mortar.



Recommendations for Valley Railroad Bridge

Repair and maintain for adaptive use as a landscape feature, with subsequent preventive maintenance as needed.

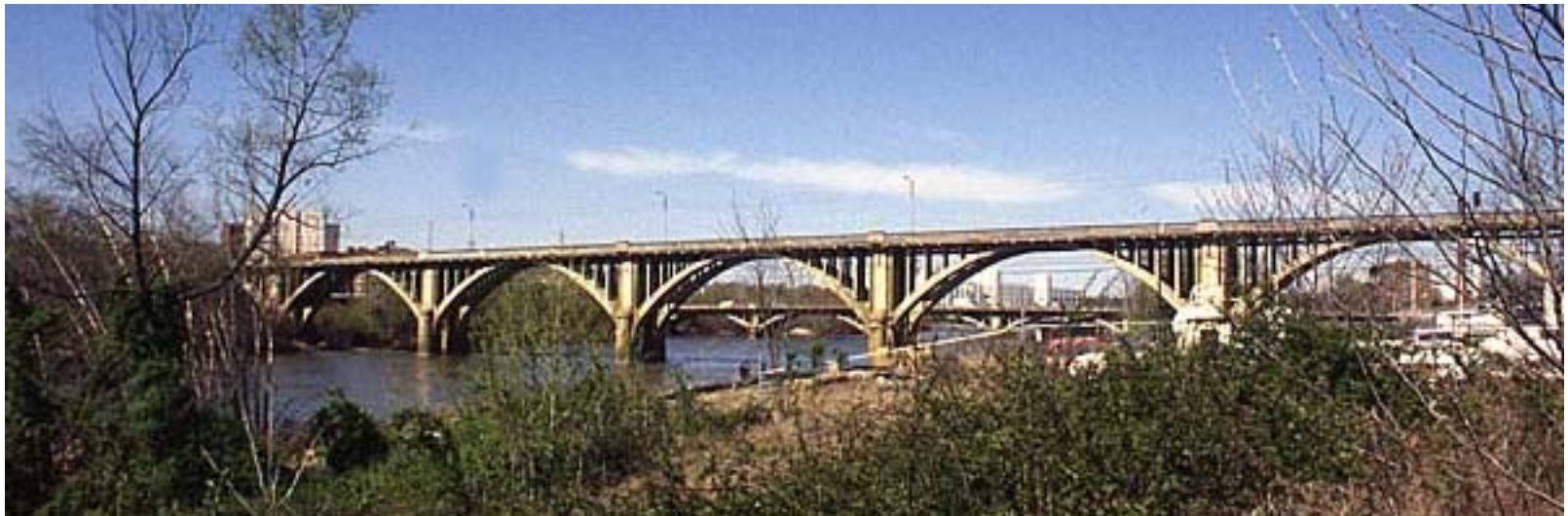


Recommendations for Valley Railroad Bridge

Remove vegetation; repair or monitor cracks as necessary; monitor and maintain the streambed; minimize seepage through the structure.

Worsham Street Bridge

Ten-span concrete arch bridge, designed by the noted bridge engineer Daniel B. Luten, built in 1928, carries Worsham Street over the Dan River in the City of Danville.



Worsham Street Bridge

Approximately 1151 feet (350.83 m.) long; span length varies and some spans are asymmetrical.





Worsham Street Bridge

The concrete is failing, apparently due to poor mixture and/or placement at the time of original construction. Despite numerous repairs, there are extensive areas of deteriorated and delaminating concrete. Large pieces of concrete have fallen from the bridge.



Worsham Street Bridge

Deck, wearing surface, spandrel beams, floor beams, spandrel columns and floor beam cantilevers are in very poor condition.

The arches, piers, and abutments are in fair condition. The bridge has been closed to traffic.



Recommendations for Worsham Street Bridge

Document and demolish was the most feasible option due to the extreme degree of deterioration in this structure. Other options will be extremely expensive and will require extensive rebuilding.



Recommendations for Worsham Street Bridge

Preservation of this bridge would entail a near-complete rebuilding of the structure. This would be a copy of the bridge, not a rehabilitation. The city government has voted to demolish the bridge.

Goshen Bridge

Two-span steel Pratt through truss, built 1890, approximately 261 feet (79.55 m.) long overall



Goshen Bridge

Trusses are approximately 139 feet (42.37 m.) and 121 feet (36.88 m.) long





Goshen Bridge

Designed and built for the early planned industrial community of Goshen in Rockbridge County.

One of Virginia's earliest multi-span truss bridges; built on a skew; an early multimodal bridge.

Goshen Bridge

There were numerous areas of corrosion and section loss to steel members. Piers were missing mortar and some substructure stones.



Goshen Bridge

Roller bearing devices were frozen and some were displaced. Debris was present on the bridge seats, connections and between stringers.



Goshen Bridge

Only one lane was open to vehicular traffic; the other lane (originally planned as a streetcar lane) had not had decking for at least 50 years.





Goshen Bridge

There was strong local and regional support for rehabilitating the structure rather than replacing it with a new bridge.



Goshen Bridge

The Management Plan supported the plan to rehabilitate this bridge. VDOT did much of the work in-house in order to develop expertise in working with historic metal truss bridges.



Goshen Bridge Rehabilitation

In 2001-2002, a full rehabilitation of this structure was undertaken by VDOT.

The stone piers were cleaned, repaired and repointed as needed, using a compatible mortar mix.



Goshen Bridge Rehabilitation

The truss was disassembled, and the members were repaired or replaced in kind as needed.

Radiographic and ultrasonic testing were required to ensure the suitability of the fracture-critical members designated for reuse.



Goshen Bridge Rehabilitation

Due to section loss, severe active corrosion, and pack rust, all end posts, hip verticals, upper chord members, counters, and pins had to be replaced.

Nearly all elements were replaced in kind.

Goshen Bridge Rehabilitation

Loop-welded eye bars and counters, which are prone to failure and have been prohibited, were not replaced in-kind.



Goshen Bridge Rehabilitation

Changes in these elements were made to comply with current American Association of State Highway and Transportation Officials (AASHTO) standards.





Goshen Bridge Rehabilitation

Due to corrosion concerns, laminated elastomeric pads were used in the expansion bearings.

Glued laminated timber deck panels replaced the original nail-laminated plank deck.



Goshen Bridge Rehabilitation

Original truss elements were taken off-site for removal of lead paint under controlled conditions.

Goshen Bridge Rehabilitation

All of the structural steel, including the bolts and bearings, was galvanized.



Goshen Bridge Rehabilitation

The truss elements were reassembled.





Goshen Bridge Rehabilitation

Tension control bolts, placed with the round head on the visible face of the structure, were used in the reconstruction of the bridge to replace rivets.

Goshen Bridge Rehabilitation

The bridge was restored for two lanes of vehicular traffic, and included the capacity to carry emergency vehicles. It was reopened in July, 2002.





Conclusion

Some 30% of Virginia's historic bridges have already undergone or are currently undergoing rehabilitation under Virginia Department of Transportation (VDOT) Historic Bridge Management and Maintenance Plan.



Conclusion

VDOT continues to support this plan and is moving forward with additional rehabilitation projects.