THE VIRGINIA DEPARTMENT OF TRANSPORTATION'S HISTORIC BRIDGE MANAGEMENT AND MAINTENANCE PLAN

M. Kerley, P.E.
Chief Engineer, Virginia Department of Transportation, U.S.A.
Mal.Kerley@VDOT.Virginia.gov
A. Miller
Senior Research Scientist, Virginia Transportation Research Council, U.S.A.
Ann.Miller@VDOT.Virginia.gov

ABSTRACT

The Virginia Department of Transportation (VDOT) maintains the third largest state maintained transportation network in the United States. In order to preserve Virginia's heritage as well as provide for today's mobility needs, VDOT has developed a Historic Bridge Management and Maintenance Plan. The development of the plan was a joint effort of core VDOT Divisions—Structure and Bridge; Environmental; and the VDOT Research Division, the Virginia Transportation Research Council (VTRC). VDOT, through VTRC, had previously documented the various types of older bridges in Virginia, and had identified the historically significant structures (those bridges eligible for the United States National Register of Historic Places). Once historic significance had been determined, the next logical step in dealing with these historic structures was the development of a management plan for each historic structure.

This project identified and considered the numerous issues (including legal, engineering, regulatory, financial, preservation and political issues) that arise concerning historic bridges. Different kinds of treatment, management, and maintenance options were also identified and evaluated. An historic bridge management database was specially developed and refined for this project. Specific recommendations were formulated for each one of Virginia's historic bridges under VDOT purview.

1. INTRODUCTION

The Virginia Department of Transportation (VDOT) maintains the third largest state maintained transportation network in the United States. In order to preserve Virginia's heritage as well as provide for today's mobility needs, VDOT has developed a Historic Bridge Management and Maintenance Plan. The development of the plan was a joint effort of core VDOT Divisions—Structure and Bridge; Environmental; and the VDOT Research Division, the Virginia Transportation Research Council (VTRC). This paper presents VDOT's Historic Bridge Management and Maintenance Plan.

2. DOCUMENTATION AND EVALUATION FOR HISTORIC SIGNIFICANCE

Over the past 30 years, the Virginia Department of Transportation (VDOT), through its research division, the Virginia Transportation Research Council (VTRC), has documented the various types of older bridges in Virginia. Thematic bridge studies completed by VTRC include those for Virginia's metal truss bridges and masonry and concrete arch bridges (originally undertaken in the 1970s and 1980s, and updated in the mid-1990s), non-arched concrete bridges, covered bridges, and movable span bridges (undertaken in the 1990s).

After the populations of each of these types of bridges were documented, these bridges were evaluated for historic significance through the Virginia Department of Historic Resources (the State Historic Preservation office) in cooperation with VDOT. ("Historic significance" indicates eligibility or listing on the U. S. National Register of Historic Places.)

The criteria for the National Register are established by U. S. federal regulations (36 CFR Part 60). To be eligible for the National Register, a property must possess both significance and integrity (i. e., the property not only must have a recognizable association with certain well-defined criteria regarding historical or structural importance, but must also be reasonably intact). National Register guidelines specify that for a property to qualify for the National Register it must meet one of the National Register Criteria for Evaluation by (1) being associated with an important historic context, and (2) retaining historic integrity of those features necessary to convey its significance. The National Register has four specific criteria for evaluation, as defined by 36 Code of Federal Regulations (CFR) Part 60 (National Park Service, 1995) [1]:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
B. That are associated with the lives of persons significant in our past; or
C. That embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. That have yielded, or may be likely to yield, information important in prehistory or history.

3. ELEMENTS OF THE HISTORIC BRIDGE MANAGEMENT AND MAINTENANCE PLAN

Once historic significance had been determined, the next logical step in dealing with these historic structures was the development of treatment and management recommendations for each historic structure. The Virginia historic bridge management project utilized the data already gathered by VTRC, along with technical information provided by VDOT central office and district personnel. Additional input was provided by the Virginia Historic Structures Task Group, an interagency, interdisciplinary committee charged with making recommendations for Virginia's historic transportation structures. The Task Group includes civil engineers, architectural historians, an archaeologist, and environmental scientists. The Task Group's

members are representatives of various state and federal agencies: VDOT, VTRC, the Federal Highway Administration, and the Virginia Department of Historic Resources (the State Historic Preservation office).

This historic bridge management project identified and considered the numerous issues (including legal, engineering, regulatory, financial, preservation and political issues) and variables that arise concerning the management and maintenance of historic bridges. The Task Group's then-liaison from the Virginia Department of Historic Resources worked with the Task Group in interpreting the U. S. National Park Service's *The Secretary of the Interior's Standards* for bridge repair, rehabilitation, and replacement situations (Morton, Hume, Weeks, and Jandl, 1992) [2].

Different kinds of treatment and management options were also identified and evaluated, and specific management recommendations were formulated for each one of Virginia's historic bridges under VDOT purview. An historic bridge management database was specially developed and refined for this project. This relational database, utilizing the Microsoft Access program, contained general information on each structure, and included a decision matrix allowing consideration of the variables noted above. This database also served to provide an electronic record of the structures and issues involved, as well as a record of the deliberations.

The final management plan included specific recommendations for each of Virginia's 55 National Register-eligible or National Register-listed bridges under VDOT purview. These include early- and mid-19th century masonry arch turnpike bridges, mid- and late-19th century wooden covered bridges, metal truss bridges ranging in age from 1870 to the 1930s, and early 20th century arched and non-arched reinforced concrete bridges. In the great majority (over 40) of these cases, it was feasible to preserve the structure on-site and under continued vehicular use. An additional 10 bridges have been or may soon be taken out of vehicular service; the recommendations supported their continued or potential adaptive use as footbridges and bicycle bridges in waysides or park settings.

The management of historic bridges is complicated by two primary types of issues: structural and funding issues. The structural standards and capacities of many, if not most, historic bridges belong to an earlier day. Bridges constructed for light traffic consisting of horse-drawn vehicles or early automobiles frequently have structures and dimensions that are inadequate (and often grossly inadequate) for the demands of modern traffic. In particular, early masonry, wooden truss, and metal truss bridges represent obsolete technologies and were often constructed via empirical knowledge and imperfect estimates of strength. Structural assessment and analysis of these structures may be difficult, repairs and replacement of deteriorated elements are difficult and expensive, and competent practitioners of early technologies are often difficult to locate. Some typical early construction and maintenance practices, notably the lead paint once routinely used on metal truss bridges, are now known to pose environmental hazards, and correction of such problems involves special procedures and considerable expense.

In addition to the higher costs often associated with certain types of maintenance and repair work on historic bridges, necessary work on historic bridges must compete with many other projects for a limited amount of transportation funding. Rehabilitation costs for an historic bridge can often approach or even exceed the cost of a new bridge. Even significant repairs

to a single historic bridge can often make major inroads upon a district or county bridge budget. Particularly in cases of historic bridges located on secondary roads, it is often difficult for county officials, who have input into the prioritizing of these projects, to agree to spend the majority of the yearly budget on one bridge when the same money would repair, upgrade, or even replace a number of other bridges. Accordingly, the Task Group strongly believed that a management plan for historic bridges should reflect the importance of preventive maintenance in addition to any necessary repairs or rehabilitation: ongoing preventive maintenance is important as an aspect of both responsible stewardship of an historic resource and responsible handling of public monies.

Two historic preservation items in the management plan are worthy of mention. Through several Memorandums of Agreement and a Programmatic Agreement in the 1990s, VDOT and the Virginia Department of Historic Resources (the state historic preservation office) established procedures regarding determination of historic significance and treatment of transportation structures, including procedures for resolving any disputes that may arise. The success of the interagency Historic Structures Task Group to date indicates that the system is working. Also, as noted previously, an interpretation of the *Secretary of the Interior's Standards*, tailored to bridges instead of the more usual buildings, was also composed as part of the historic bridge management plan.

Another significant component of the management plan was the relational database and decision matrix developed specifically for the project. To compare the merits of the various preservation options and ultimately select the best plan, the Task Group needed a wealth of information at their disposal. This necessary information ranged from engineering data (including the description and condition of the structure, and the ability of the structure to function under modern loads and resist flood damage), to environmental hazards such as lead paint, to social issues such as customer satisfaction. The database was designed not only to store and retrieve information on the bridges themselves but to help streamline and document the Task Group's decision process and recommendations for bridge management.

The following management options and variables were considered for each bridge:

Management Option Categories

- *Repair and Maintain for Vehicular Use.* Make the improvements necessary to use the structure for vehicular use.
- *Structural Upgrade to DOT Standards.* Make necessary improvements to the structure to comply with DOT standards
- *Repair and Maintain for Adaptive Use*. Make the improvements necessary to use the structure for a purpose other than vehicular use on-system (e.g., footbridge or in a reduced load environment).
- *Transfer Ownership (On-Site)*. Leave the bridge in place but transfer the ownership and liability to another party.
- *Preventive Maintenance.* Do minor repairs and maintenance to keep the structure open and to avoid/minimize future deterioration.
- *Discontinue.* Take the structure off-system while maintaining the legal right of way.
- *Abandon.* Take the structure off-system and end the legal right of way.
- *Transfer Ownership (Off-Site)*. Give the structure to an interested party who will dismantle and relocate it.

- *Document and Retain for DOT Use.* Document the structure, dismantle it, and save it for future vehicular use by the DOT in another location.
- *Document and Retain for Adaptive Use*. Document the structure, dismantle it, and save it for future adaptive use.
- *Document and Demolish.* Document the structure and demolish it.

Variable Categories

- *On Site*. This indicates whether the structure would remain in its current location if the treatment option were selected.
- *Strengthens*. This indicates whether the treatment option would strengthen the bridge (i.e., increase the load capacity).
- *Structural Function*. This indicates whether the structure will continue to function as a bridge in the same way as it has historically if that treatment option is selected.
- *Sec. Standards*. This indicates whether this treatment option would be consistent with the Secretary of the Interior's Standards for Rehabilitation.
- *DOT Standards*. This indicates whether the treatment option would either maintain or bring the structure into compliance with DOT standards especially with regard to width of roadway and load capacity.
- *Approaches*. This indicates whether the treatment option would either maintain or bring the roadway approaches to the bridge into compliance with current DOT standards for sight distance and safety.
- *Hydraulic Opening*. This indicates whether the treatment option would either maintain or bring the hydraulic opening of the bridge to a size that would prevent damage in most flooding situations. This is, of course, not applicable where the bridge crosses a highway or a railroad.
- *Customer Satisfaction*. This indicates the level of satisfaction the treatment option would bring to the DOT, the preservation community, and local citizens.
- *Lead*. This indicates whether the treatment option will cause concerns for lead paint issues either at the time the option is taken or in the future.
- *Initial Cost*. This indicates a consensus on what the comparative costs of the treatment option would be. These estimates do not include the costs of a potential replacement structure.
- *Extended Cost*. This indicates a consensus on what the comparative costs of the future long-term cost of the treatment option would be. These estimates do not include the costs of a potential replacement structure.
- *New Structure*. This indicates whether a new structure would be necessary at that location if the treatment option were undertaken.
- *Tort Risk*. This indicates the comparative level of legal liability to the DOT if the option were chosen.
- *Other*. This indicates other, miscellaneous concerns specific to a particular bridge.
- *Plan Priority*. Finally, the level of priority for each treatment plan option was noted.

Using the database and related management matrix, the Task Group discussed the various issues and options for each bridge and evaluated and ranked management recommendation options. For some bridges, only one option was feasible; for other bridges, several options were possible, and these were ranked numerically in order of feasibility (as determined via use of the matrix, with 1 as the highest ranking). In some cases, two options were

recommended equally; in keeping with the Task Group's philosophy, "Preventive Maintenance" was frequently recommended equally with other options. If an option was "not applicable," "not recommended," or determined to be "not feasible" by the Task Group, this was stated in lieu of a numerical rating.

The recommendations in the management plan were adopted and are being used by the Virginia State Structure and Bridge Engineer. Some 30% of these historic structures have previously or are currently undergoing rehabilitation. Completed rehabilitation projects include several masonry arch bridges and metal trusses.

4. REPRESENTATIVE EXAMPLES

The following are representative examples of the application of the plan. These include:

- a non-arched concrete bridge which has remained under vehicular traffic;
- a through Pratt steel truss bridge which has been fully rehabilitated and returned to full vehicular use;
- a stone masonry arched railroad bridge which does not carry traffic but serves as a landscape feature; and
- a concrete arched bridge which, due to very severe concrete deterioration, is recommended for demolition.

Figure 1 – Detail of concrete railing and obelisks, Appomattox County Structure No. 1002

4.1. Appomattox County Structure # 1002

Appomattox County Structure No. 1002 is a single-span reinforced concrete T-beam structure [104], built in 1930 with a 1971 widening, carrying Rt. 24 crossing the Appomattox River in Appomattox County, Virginia (Figure 1). The structure is approximately 33 feet (10.06

m.) long. It is historically significant on a number of points: as a commemorative bridge specifically designed and built for use in the vicinity of the Civil War surrender site at Appomattox Court House, for its association with one of the first waysides (roadside parks) in Virginia, and for its decorative elements. This structure has unique cast concrete rails incorporating stylized Union and Confederate flag motifs, with endposts topped with obelisks. The bridge, which was designed by Virginia State Bridge Engineer William R. Glidden, antedates the national park at Appomattox by five years, and was originally intended as part of a memorial wayside. When the bridge was widened from 30 feet (9.14 m.) to 38 feet (11.58 m.) in 1971, the rails were moved and reused, and the end posts and obelisks were replicated.

This structure was included in the non-arched concrete bridge survey prepared by the VTRC (Miller, McGeehan, and Clark 1996) [3], and was recommended as eligible for listing in the National Register of Historic Places by the Historic Structures Task Group in November 1995, a determination confirmed by the Virginia SHPO and VDOT's Commissioner by agreement dated October 23, 1997. Subsequently, a formal National Register nomination was written by VDOT cultural resource staff, and the structure was listed on the Virginia Landmarks Register and the National Register of Historic Places in 2005.

Condition issues were relatively minor for this bridge at the time that the Management Plan was formulated. There were some spalling and moisture seepage in the bottom deck. Cracks were present in the breast wall and in the T-beams. There was a small amount of spalling on the railposts. There was scour in the channel and under the footing. Additionally, there was scaling of the breast wall and delamination in the endwall. The wearing surface was delaminated. Vegetation was encroaching on the bridge.

Management Plan Recommended Treatment: Due to its concrete construction, location, and unique decorative design, moving the structure to another location or abandoning it were not considered options. Demolition was not recommended. The structure had already been widened; an upgrade to DOT standards was not necessary. The recommended management options for this structure were, in order of preference:

1) Repair and maintain for vehicular use, with subsequent preventive maintenance as needed. Immediate repair recommendations were to remove the asphalt overlay, evaluate and repair the deck, install a new concrete overlay, clean drains, remove vegetation, repair spalled and delaminated areas, and address the scour problem. Hydrologic and hydraulic analysis was recommended.
2) Transfer of ownership was not considered a feasible option under present conditions. However, it was noted that Rt. 24 to be realigned in the future, and in the event of interest in acquiring the bridge on the part of the National Park Service, this could be considered as a second option.

Figure 2 – The rehabilitated Goshen Bridge

4.2. Rockbridge County Structure No. 6145

Known familiarly as the Goshen Bridge, Rockbridge County Structure No. 6145 is a two-span steel Pratt through truss, built in 1890 by the Groton Bridge Co., carrying Rt. 746 crossing the Calfpasture River near Goshen, Virginia (Figure 2). This structure is approximately 261 feet (79.55 m.) long overall; the trusses are approximately 139 feet (42.37 m.) and 121 feet (36.88 m.) long. Originally designed and constructed for the planned industrial community of Goshen, this bridge has a number of points of historical significance: it is associated with an early planned industrial community; it is one of Virginia's earliest multi-span truss bridges; it is built on a skew; and it is an early multimodal bridge. As originally designed, the structure included a lane for vehicular traffic and a lane for streetcars, as well as a cantilevered sidewalk. Rockbridge County Structure No. 6145 was included in the initial metal truss survey report prepared by the VTRC (Deibler 1975) [4] and the more recent update (Miller and Clark 1997) [5]. It has also been recorded to Historic American Engineering Record Standards (HAER No. VA-102). The structure was placed on the Virginia Landmarks Register in 1977, and on the National Register of Historic Places in 1978.

By the end of the 1990s, this structure had numerous areas of corrosion and section loss to steel members. Piers were missing mortar and substructure stones in various locations. The roller bearing devices were frozen and some were displaced. In addition, debris was present on the bridge seats, connections and between stringers. Only one lane was open to vehicular traffic; the other lane, which was originally planned as a streetcar lane, had not had decking for at least 50 years; there was attendant corrosion of the exposed members. There was strong local and regional support for rehabilitating the structure rather than replacing it with a new bridge. VDOT's Staunton District Structure and Bridge office, after studying the situation, made the decision to undertake the design and construction project, and to do much of the work in-house in order to develop strong expertise in working with historic metal truss bridges.

Management Plan Recommended Treatment: The Task Group concurred with the plan to rehabilitate this bridge. Members of the Task Group assisted the Staunton District Structure and Bridge office in planning the necessary upgrades and rehabilitation in order to preserve the structure's historic integrity.

In 2001-2002, a full rehabilitation of this structure was undertaken by VDOT through its Staunton District Structure and Bridge office. The stone piers were cleaned, repaired and repointed as needed, using a compatible mortar mix (i.e., with both lime and Portland cement components, instead of pure Portland cement content). 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.

Due to a large amount of severe deterioration in the truss members, a particularly large number of members (over 100) had to be replaced. Section loss, active corrosion, and pack rust necessitated the replacement of all end posts, hip verticals, upper chord members, counters, and pins. Nearly all elements were replaced in kind. The few exceptions included the loop-welded eye bars and counters: due to a tendency to fail, this technology has long been prohibited, and changes in these elements had to be made to comply with current American Association of State Highway and Transportation Officials (AASHTO) standards. 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.

Following disassembly of the truss, original elements were taken off-site for removal of lead paint under controlled conditions. Subsequently, all of the structural steel, including the bolts and bearings, was galvanized. Following galvanization, the truss elements were then reassembled. The original members were connected with rivets; in the absence of modern professional riveting gangs, tension control bolts, placed with the round head on the visible face of the structure, were used in the reconstruction of the bridge.

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

Figure 3 – The Valley Railroad Bridge

4.3. Augusta County (No VDOT Structure Number) Valley Railroad Bridge

Known familiarly as the Valley Railroad Bridge, this structure is a four-span masonry arch bridge, crossing Folly Mills Creek just west of Interstate 81, south of the city of Staunton in Augusta County (Figure 3). The structure is approximately 147 feet (44.81 m.) long. Built in 1874 to carry rail traffic on the Valley Railroad, this large multi-span masonry arch bridge is one of the largest and most visible 19th century masonry railroad bridge structures in Virginia. The railroad line was discontinued in 1942, and the tracks were taken up. The bridge is now preserved as a landscape element adjacent to Interstate 81. The Valley Railroad Bridge was included in the initial arch bridge survey report prepared by the VTRC (Spero 1984) [6] and the more recent update (Miller and Clark 2000) [7]. The bridge was listed on the Virginia Landmarks Register and the National Register of Historic Places in 1974.

The Valley Railroad Bridge and its approaches carry no traffic of any kind; the structure is located within the right-of-way for Interstate 81; right-of-way ownership for this structure is not applicable. There are grass, weeds, vines, bushes and small trees growing on the old roadway and various other areas of the bridge. The bases of two piers along the creek have concrete aprons added as a stabilization measure. There are some areas of seepage through the arch, and corresponding loss of mortar; some repointing has been done with Portland cement.

Management Plan Recommended Treatment: Although unsuitable for use as a vehicular or pedestrian bridge due to its location in the Interstate 81 right-of-way, the Valley Railroad Bridge is one of the most visible, and popular, historic bridges in Virginia. Due to its location, material and appearance, it is a striking landscape feature, and it is seen and remarked upon by thousands of drivers every day. A condition assessment in the near future would be helpful to fully identify current and potential problems and needs. A structure number should be assigned and the structure should be placed on a regular inspection schedule. Once the structure is inventoried within HTRIS, VDOT can use state maintenance funds to work on a bridge asset, albeit out-of-active service. This attractive and highly visible historic bridge should be considered a candidate for a transportation enhancement grant. Due to its masonry construction and location, moving the structure to another location is not an option. Other usual options such as upgrade to DOT standards, transferring ownership, etc. are not applicable in the case of this structure, which will not carry either vehicular or foot traffic. The recommended management options for this structure are to repair and maintain for adaptive use (i.e., its continuing role as a landscape feature), with subsequent preventive maintenance as needed. Immediate maintenance recommendations are to remove the vegetation from the bridge. The grass on the roadbed is not a serious encroachment, but the vines, bushes and trees should be removed to prevent further damage to the structure. A structural assessment should be made of the cracks in the bridge, these should be repaired or monitored as necessary; an appropriate mortar mix [part-lime, not pure Portland cement] should be used for repointing. Monitoring and maintenance of the streambed should be continued. In order to minimize seepage through the structure, the roadway should be evaluated for the most effective sealing and drainage methods (possibly an impermeable clay liner and drainage pipe inserted into the roadway to promote runoff). Interpretive signage regarding the bridge

should be placed at flanking rest areas. The feasibility of interesting an “Adopt-A-Highway” group in this bridge should be examined.

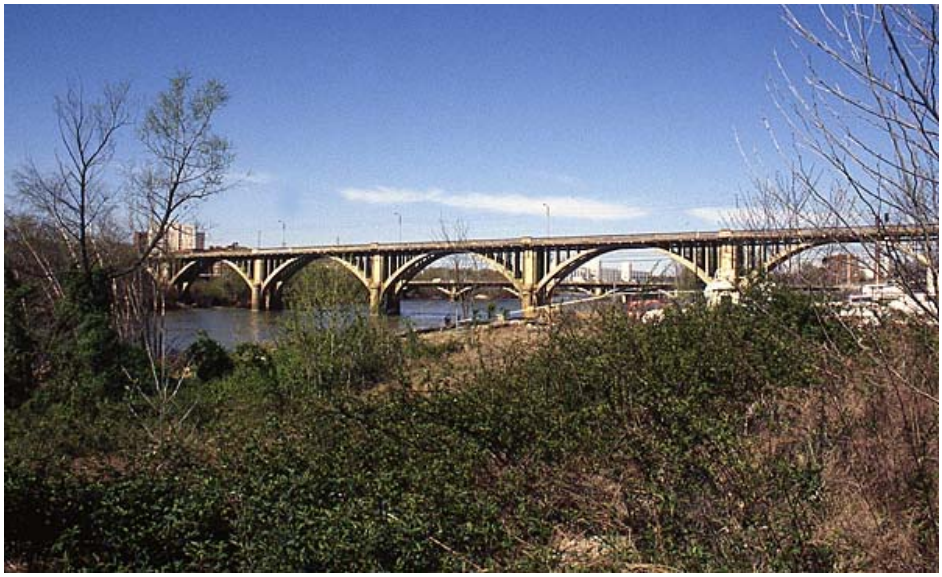

Figure 4 – Worsham Street Bridge

4.4. City of Danville Structure No. 8006

Known locally as the Worsham Street Bridge, City of Danville Structure No. 8006 is a ten-span concrete arch bridge with decorative molded balusters on the railing (Figure 4). The six central spans are open spandrel arches; flanking these are spans that are half open spandrel and half closed spandrel; the end (approach) spans are closed spandrel arches. Designed by the noted and prolific bridge engineer Daniel B. Luten, who specialized in arched concrete bridges, the Worsham Street Bridge was built in 1928. The Atlantic Bridge Company was the contractor. The bridge carries Worsham St. crossing Dan River. The bridge is approximately 1151 feet (350.83 m.) long; a number of the spans are asymmetrical, and spans differ in length. This structure is significant as a good example of a large urban Luten-designed bridge. City of Danville Structure No. 8006 was included in the initial arch bridge survey report prepared by the VTRC (Spero 1984) and the more recent update (Miller and Clark 2000). The structure was recommended as eligible for listing in the National Register of Historic Places by the Historic Structures Task Group in May 1998, a determination confirmed by the Virginia State Historic Preservation Officer and VDOT’s Commissioner by agreement dated September 5, 2000.

This structure is within the limits of the City of Danville. The city owns and maintains the structure. The concrete is failing, apparently as a result of poor mixture and/or placement at the time of original construction. Despite numerous repairs, by the end of the 1990s this bridge was in very poor condition, with extensive areas of deteriorated and delaminating concrete, and the east side (approx. 4.5 feet [1.37 m.] width) of the bridge had been closed to traffic. Subsequently, after a number of large pieces of concrete fell from the bridge, the bridge was completely closed to traffic. It remains closed, and has continued to deteriorate.

The 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.

Management Plan Recommended Treatment: Due to its concrete construction and location, its poor condition, and because the city owns and maintains this bridge, moving the structure to another location, abandoning it, or transferring ownership are not options. Recommended management options for this structure, in order of preference, are:

1) Document and demolish. Due to the extreme degree of deterioration in this structure, the Task Group recommends this as the most feasible option. The following options, while possible, will be extremely expensive and will require extensive rebuilding, and in many cases, considerable alteration, of the structure.
2) Repair and maintain for adaptive use.
3) Repair and maintain for vehicular use.
4) Upgrade to DOT standards.
5) Preventive maintenance: the degree of deterioration makes this difficult to justify as an attractive option.

Although local historic preservation groups have lobbied the city government to preserve and restore the structure, it has been impossible to determine a structurally-feasible and economically-feasible plan. Preservation of this bridge would entail a near-complete rebuilding of the structure, and this would effectively be the construction of a copy of the bridge, not a restoration of the structure. The city of Danville government recently has voted to demolish the bridge.

5. CONCLUSION

The above-mentioned four bridges and their treatments are representative examples of the application of the Virginia Department of Transportation (VDOT) Historic Bridge Management and Maintenance Plan. Nearly 20 bridges have already undergone or are currently undergoing rehabilitation according to the plan. VDOT continues to support this plan and is moving forward with planning additional rehabilitation projects for the historic bridges under its purview.

A number of reports on the documentation and management of historic bridges are available through the Virginia Transportation Research Council (VTRC) website. These include *A Management Plan for Historic Bridges in Virginia*, *Best Practices for the Rehabilitation and Moving of Historic Metal Truss Bridges*, and *History of Early Bridge Specifications: A Reprint of a Paper by J. N. Clary*. These reports may be downloaded from the publications section of the VTRC website at http://vtrc.virginiadot.org/PUBS.aspx

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