

Preserving Transportation's History

Introduction

ROBERT F. CRECCO

The United States of America is a young nation. Countries with cultures centuries old see it as having no real past, little or no architectural tradition, and only a rudimentary historic preservation program. Although it is true that this country has much to learn about historic preservation from other countries, Americans have come a long way in the last two decades or so in preserving the past.

The year 1991 marked the 25th Anniversary of the National Historic Preservation Act (NHPA). This act is the linchpin of the program created to preserve and protect America's heritage. Spurred by public concern for the environment and the loss of historic sites to urban renewal, the Interstate highway system, and other public works, Congress passed both the NHPA and the U.S. Department of Transportation Act in 1966. The DOT act features a further requirement that solely affects federal transportation projects for historic sites.

As the federal historic preservation program took shape, it led to significant changes in the structure of state and local government preservation programs. Succeeding federal legislation augmented protective institutions and measures such as the state historic preservation office, the need for state historic site inventories, and the role of local historic preservation organizations. Today all affected federal and state agencies plan for the preservation and protection of historic and archeological sites. Both federal and state departments of trans-

portation have in place procedures for developing environmental impact documents, identifying historic sites for inclusion in the National Register of Historic Places, and planning projects to avoid or mitigate impact on cultural resources.

The salient points of the national historic preservation program are discussed, along with historic and archeological planning in transportation and the concern for historic bridges, on the following pages. The appeal of bridges and railroad stations—especially those of historic interest—is strong, as is Americans' concern for their national heritage. At all levels, the transportation indus-

try is cognizant and supportive of measures to protect and preserve this inheritance.

In 25 years, the National Historic Preservation Program has helped preserve an extraordinary array of American historic and archeological resources. Consider that the National Register of Historic Places created by the NHPA has 58,000 listings covering more than 800,000 significant resources. Hundreds of these are transportation-associated resources such as light-houses, railroad stations, bridges, vessels, roads, canals, and even an airport terminal. National Historic Landmarks number 2,000 and more than 25,000 historic build-



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Resident archeologist at California's San Juan Capistrano Mission describes archeological excavations to participants in 1991 summer workshop of TRB's Committee on Historic and Archeological Preservation in Transportation.

ings and structures have been documented in the Library of Congress.

Departments involved in historic preservation under the U.S. Department of Transportation are the U.S. Coast Guard, Federal Aviation Administration, Federal Highway Administration, Federal Railroad Administration, Federal Transit Administration (formerly Urban Mass Transit Administration), and Maritime Administration. The highway program, which plays the largest role in historic preservation for the U.S. DOT, has far-ranging projects through state highway agencies that affect historic structures, sites, and archeological resources.

The Federal-Aid highway program is administered through a partnership between FHWA and state highway agencies (SHA). FHWA provides guidance and financial assistance and is responsible for certain key approvals; SHA initiate, plan, design, build, and operate highway projects. Historic and archeological preservation in the highway program are the responsibility of both FHWA and the states.

About TRB's Preservation Committee

TRB's Committee on Historic and Archeological Preservation in Transportation was formed in January 1990 from a subcommittee that presented sessions on historic preservation over a 10-year period at the TRB Annual Meeting.

The committee's scope is to consider the laws, regulations, policies, and procedures for the preservation of historic structures and archeological materials, information, and cultures. Committee members represent disciplines in history, architecture, archeology, engineering, environment, and planning.

In August 1990 the committee conducted a workshop in Wilmington, Delaware. Workshop discussions and presentations examined historic and scenic byways and how the beauty, amenities,

and quality of life of state roadways can be protected and the state's economic base increased. Historic bridges and plans for the maintenance and reuse of significant bridges for transportation not subject to federal protection were other topics discussed.

A second workshop was held in August 1991 in Irvine, California. The major topics of the western meeting were archeology and the protection of Native American graves.

All TRB members, practitioners, and interested parties are invited to join the committee's activities. For suggestions for topics for the July 23-25, 1992, Summer Workshop in Dubuque, Iowa, contact Committee Chairman Robert Crecco (telephone 301-345-9024).

Historic and Archeological Preservation

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The archeological side of the transportation historic and archeological program developed initially from a desire to protect archeological resources uncovered during highway construction and to provide for the study of recovered archeological materials. The first federal-state highway archeological excavation took place in 1954 before any government-wide legislation was in effect and before the creation of FHWA.

Officials of the New Mexico State Highway and Transportation Department and representatives of FHWA (then the Bureau of Public Roads) were concerned about the

loss of archeological materials caused by highway construction. They devised a plan to use highway crews to help the archeological staff of the New Mexico Museum excavate archeological resources in roadway construction. The plan resulted in the

excavation of stone and pottery artifacts and the investigation of the soil for clues about environmental conditions when the location was inhabited. The cost was minimal, and construction progress was not delayed. The plan served as a model for



Colonial period Post road. Archeologists contribute their techniques to the study of historic roads uncovered during highway construction.

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Congress and was incorporated into the Federal-Aid Highway Act of 1956 as a federally funded activity that the states could adopt. A dozen SHA did so within the decade.

Historic Preservation Legislation

With the passage of the National Historic Preservation Act in 1966, Congress set out a comprehensive approach to historic resources. Before a federal or federally aided project could proceed, the agency had to identify and evaluate all the resources that might be modified, damaged, or destroyed by the project. It also had to consider the effect the project might have on these resources. To assist federal agencies in performing these activities, Congress created the President's Advisory Council on Historic Preservation to review federal activities and directed the National Park Service to expand its National Register of Historic Places program to provide a mechanism to evaluate the historic, archeological, and architectural value of properties.

In 1966 Congress also passed legislation to create the Department of Transportation. Section 4(f) of this legislation required that historic resources (and parks, wildlife refuges, and so on) be protected unless it could be shown that there was no prudent or feasible alternative to their involvement in the transportation project. Although the DOT and NHP acts were passed by the same Congress, their historic preservation provisions took different approaches. The two acts provided positive consideration for historic, archeological, and architectural resources but used separate review processes. The DOT act [Section 4(f)] directed that avoidance of the historic resource be the first consideration. The NHPA (Section 106) stipulated a mitigation agreement as its goal of lessening impacts on historic resources.

The National Environmental Policy Act of 1969 charged federal agencies and some state agencies to evaluate the range of project-related impacts on the environment and involve the public in decision making. This act specifically called for agencies to adopt a multidisciplinary approach to deci-



Because of proximity of this historic site to road, the New Mexico State Highway and Transportation Department was able to encourage visitors to tour excavation.

Historic Preservation Enhancements of New Transportation Act

Legislation requires each state to spend no less than 10 percent of the funds it receives from the Surface Transportation Program (STP) on a new category of activities called transportation enhancements. These activities are defined for use with any project or the area to be served by the project. This new category of funding from STP requires the states to spend at least \$3 billion on enhancements during the act's six years.

Enhancement activities include

- Scenic and historic highway programs;
- Acquisition of scenic easements and scenic or historic sites;
- Historic preservation;

- Rehabilitation and operation of historic transportation buildings, structures, or facilities, including historic railroad facilities, bridges, and canals; and
- Archeological planning and research.

A historic preservation representative will be appointed to a 17-member Scenic Byways Advisory Committee to advise the U.S. Department of Transportation on the byways program that is funded at \$50 million for technical and financial assistance to the states. Another \$30 million will be provided during the next three years to existing state scenic byways programs for project grants.

sion making as it applied to the natural and the built (including historic, archeological, and architectural) environment. FHWA encouraged SHA to hire historians, archeologists, and architectural historians to develop procedures and ensure that appropriate input on historic and architectural resources be available to decision makers through environmental documents. This action ensured that historic and archeological resources would be adequately considered in the highway planning process.

The Federal-Aid Highway Act of 1970 provided federal funds for the replacement of bridges that were structurally deficient, deteriorated, or functionally obsolete. The Surface Transportation Assistance Act of 1978 amended the 1970 act by providing federal funds for the rehabilitation of bridges. The national concern for historic bridges was expressed in the Surface Transportation and Uniform Relocation Assistance Act of 1987. This legislation required all states to inventory bridges to determine their historic significance, extended the range of activities eligible for funding

involving historic bridges, required that historic bridges be made available for donation before demolition, and provided some funding to assist the new owners.

Growing public awareness of the contributions of ethnic and Native American groups has encouraged Congress to recognize this issue through the Native American Graves Protection and Repatriation Act of 1990. The act provides Native American groups, such as Hawaiians and Indian tribes, a voice and participation in the future study of prehistoric burials and the return of human remains and associated cultural materials that have been excavated from federal or tribal lands. State DOTs or state transportation agencies currently work with tribal governments and other Native American groups in early project planning and development. The act's requirements are still evolving and are expected to involve additional coordination by transportation agencies.

Investigations of Historic Resources

SHA use a variety of approaches to identify where historic, architectural, or archeological resources might be located within the project area. Some examples are checking federal, state, and university files on known resources, documentary investigations, and interviews with knowledgeable individuals. A walking survey of the project area is the first step in field work.

Archeological resources may require investigation through both surface examination and subsurface digging. Depending on the results of the reconnaissance survey, more intensive physical and documentary investigation may be needed to obtain a clearer picture of the type, nature, and scientific importance of the resource.

National Register of Historic Places Criteria

Criteria for eligibility in the National Register of Historic Places include resources that have integrity of location, design, setting, materials, workmanship, and association.

In addition they must

1. Be associated with events that have made a significant contribution to the nation's history;
2. Be associated with the lives of persons significant in the nation's history;
3. Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master; or
4. Have yielded or be likely to yield information important in prehistory or history.

When the resources are also important to the State Historic Preservation Plan and the study of history, architecture, archeology, engineering, or culture, a plan should be devised to avoid the resources or to mitigate the effect of the project. If buildings or bridges cannot be avoided, they may be moved instead of being recorded and demolished. When archeological resources cannot be avoided, excavation plans are developed to study the scientific evidence present. No matter what type of resource is involved, detailed plans are critical to success because they focus the effort on the qualities of the resource and permit the work to be completed before the start of construction activities.

Preservation Examples

The historic and archeological program of FHWA and SHA has encouraged a flexible, innovative approach. For example,

- A proposed highway was shifted 800 feet to protect an 18th-century farmstead near the Richmond National Battlefield Park in Virginia. The relocated road also served the needs of the park by providing for more efficient traffic movement, an improved entrance, and a buffer from adjacent uses.
- A highway project in St. John the Baptist Parish, Louisiana, affected an archeological campsite in Bayou Jasmine. Archeological investigations were performed surrounded by cofferdams to permit excavation in areas that would otherwise have been almost impossible to study.

The extensive peat cover provided excellent preservation of plant and animal remains, and scientists gained an understanding of how the inhabitants used the environment more than 1,000 years ago.

- The Route 82 swing span bridge, built in 1912 over the Connecticut River near Haddam and East Haddam, Connecticut, was identified as an excellent example of engineering technology and was associated with the Victorian architecture of the two communities it serves. Although the bridge was determined to be structurally deficient, bridge members were rehabilitated, electrical and mechanical components were replaced, and auxiliary members were strengthened to permit the bridge to remain in full service.

- The Washington state DOT used technology to preserve the Gray's River historic covered bridge. Structurally deficient members were replaced with laminated wood to retain the integrity of location, design, and setting.

Future Challenges

Historic preservation specialists and transportation planners and engineers will have to deal with the challenge of identifying and preserving significant historic and archeological resources. In addition, a number of new challenges will test the collective skills and abilities needed to create innovative solutions.

One issue, already mentioned, relates to the growing national concern for recognizing the contributions of ethnic and Native American groups to society. The challenge to the sciences of archeology, physical anthropology, and forensic anthropology is to balance respect for human remains with the desire to conduct scientific inquiry on health, nutrition, and environmental conditions of the past.

Another concern receiving attention is vandalism of historic and archeological resources. New techniques for resource protection and increased public awareness and education are needed to combat this activity.

An additional challenge is to develop techniques to protect archeological re-

sources and interpret them effectively and efficiently for the public. At the same time, the size and type of study sufficient for each archeological or historic resource should be reexamined. Although a great deal of information may be gained by extensive excavation, more emphasis should be placed on response to public and scientific needs.

Addressing concerns about the historical setting of cultural resources is also a priority. More cooperation among preservation and transportation planning groups is needed to determine what qualities make the setting or location of an area historic and what can be done to preserve it.

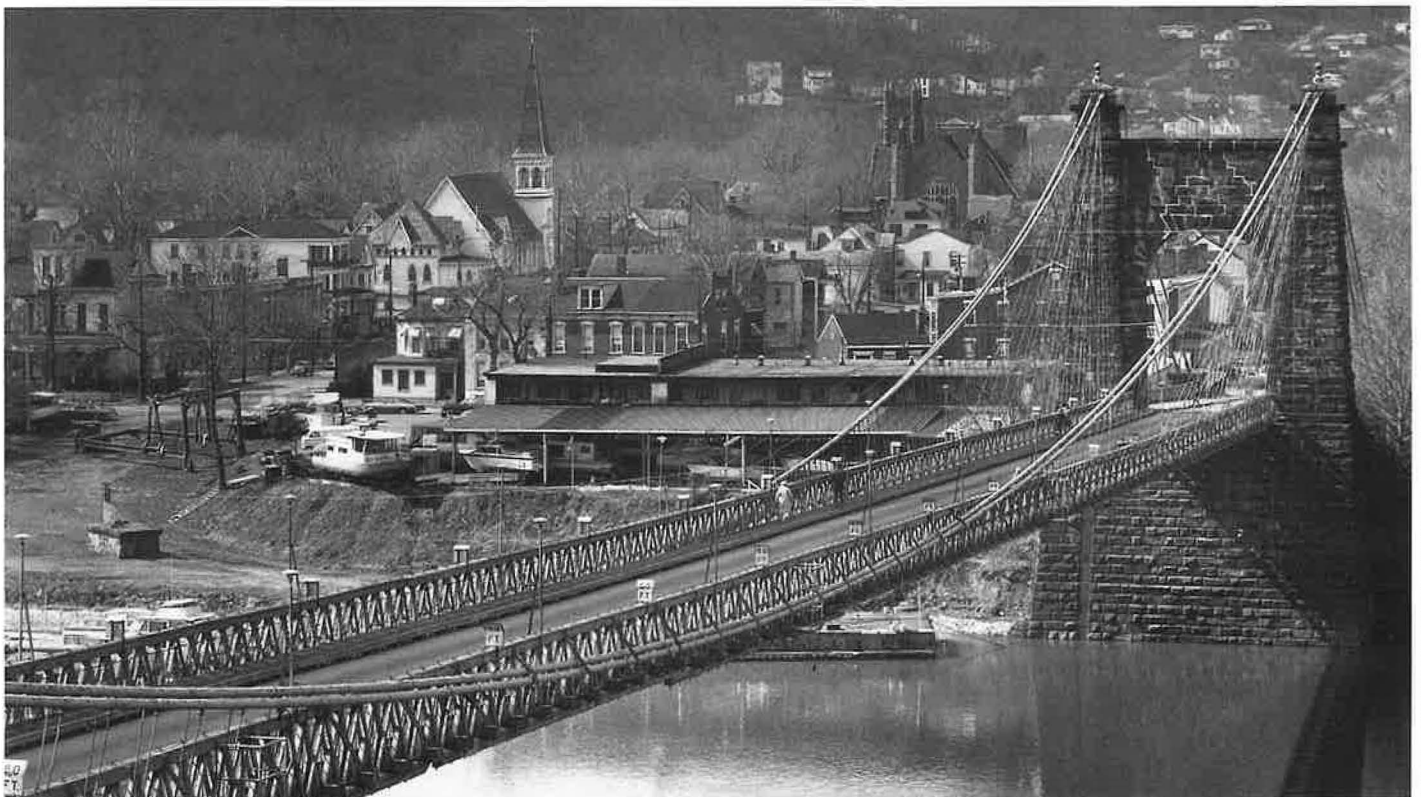


BOUCHER, HISTORIC AMERICAN ENGINEERING RECORD

Humpback Bridge near Covington, Virginia, in Shenandoah Valley. Built in 1857, this unusual covered bridge was spared by mutual agreement between opposing forces during the American Civil War.

Historic Bridges: Preservation Challenges

ERIC DeLONY and MICHAEL J. AUER



BARRETT, HISTORIC AMERICAN ENGINEERING RECORD

Wheeling Suspension Bridge in West Virginia, designed by Charles Ellet, Jr., was world's longest bridge when completed in 1849. Restoration in 1983 by West Virginia DOT won FHWA design award.

The appeal of bridges is universal. The Brooklyn Bridge became a symbol of the 19th century dream of progress, and it remains one of the best-known structures in the world. The Golden Gate Bridge defines a city. Less monumental bridges also have a place in popular affection. Covered bridges, like log cabins, hold a special place in the American imagination.

The 1989 report by the U.S. Secretary of Transportation to Congress cites a total of more than 575,000 highway bridges in the United States (1). As many as 50,000 of these are historic, according to a 1983 report by the Transportation Research Board (2). Currently, 1,520 bridges are listed in the National Register of Historic Places. Another 917 have been determined eligible for listing.

Federal Bridge Program

Bridges may delight, but increasingly their condition alarms, and the need to address bridge safety is attracting widespread attention. The U.S. DOT estimates that about 238,000 bridges, or approximately 40 percent, are structurally deficient or functionally obsolete.

The current federal bridge inspection program was initiated after the collapse of the Point Pleasant Bridge over the Ohio River in 1967. Following the work of a Presidential Task Force, Congress passed legislation to enhance bridge safety. Legislation established a bridge inspection and replacement program, and later a rehabilitation program.

All inspected bridges are assigned a rating assessing their overall condition, which is needed to rank bridges for Highway Bridge Replacement and Rehabilitation Program funds (HBRRP). Points are given for the following factors:

- Structural adequacy or capacity,

- Serviceability and functional obsolescence: an assessment of geometric and traffic capacity,

- Essentiality for public use: frequency of use and importance in the highway system.

Bridges with unsatisfactory ratings are eligible for funds from the HBRRP for either rehabilitation or replacement. Many historic bridges fall into this category. Even when they are not structurally deficient, older bridges frequently receive low marks for serviceability, thus rating as functionally obsolete. Older bridges are often capable of supporting modern traffic, but may have poorly aligned approaches by today's stan-

public. Many historic bridges that do not meet AASHTO standards are able to handle lower levels of service. For example, AASHTO requires a 30-foot-wide deck, a width that is impossible to achieve on many historic bridges built for narrower one-lane roads. Yet one community, Allegan, Michigan, found a simple solution. After upgrading, the bridge was made one-way. Because other routes served the town, this solution worked well. Later, a traffic light was installed, and alternating two-way traffic was allowed on the one-lane bridge.

Historic bridge preservation is beginning to gain momentum. The centennial of the Brooklyn Bridge in 1983 and the 50th anniversary of the Golden Gate Bridge in

Bridges are symbols of progress at many levels:
crossing one is always a small ceremony,
ending in arrival at some place separated from where we were,
except by this slender link.

—Andrew C. Lemer (3)

dards, carry only one lane of traffic, or have overhead lateral bracing systems that provide insufficient clearance for trucks.

For a number of reasons, then, historic bridges may be rated deficient and therefore eligible for rehabilitation funds or replacement. With such funds, some bridges could be repaired or rehabilitated while maintaining their historic character, but this is not often the case.

Nearly all projects using HBRRP funds must meet the standards of the American Association of State Highway and Transportation Officials, including those involving historic bridges. There are procedures for exempting bridges from these standards, but relatively few have received such exemptions.

Bridge Preservation

Despite difficulties, historic bridges have been preserved without endangering the

1987 drew public attention. Several state highway departments have now initiated historic bridge programs.

Ensuring the preservation of bridges usually requires widespread commitment. The local government must document the deficient or obsolete condition of the structure and costs of rehabilitation versus replacement. Such a study should also document the safety history of the bridge (i.e., the number and type of accidents that have occurred). This is especially important for structures rated functionally obsolete that are structurally sound. Often the record shows few or no accidents on a particular bridge.

Preservation alternatives for historic bridges include continued use for vehicular traffic or conversion to a new use. Continued use for traffic may require that a bridge be partially dismantled so that certain members can be inspected. Sound pieces can be reassembled and damaged or deteriorated pieces replaced. If the historic struc-

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tural system is weakened, it can be strengthened—sometimes in such a way that the new members do not show. In some rehabilitation cases, bridges may require geometric modification, which involves significant changes that can often be done without destroying the structure's historic character.

Other rehabilitation treatments can involve realignment of the bridge with approach roads. Still other solutions change the ways in which a bridge is used: converting a span to one-way traffic or lowering load limits. A final way to reuse a bridge for vehicular traffic is to move it. This is not practical for concrete or stone structures, but is a relatively straightforward matter for metal ones.

Keeping bridges in vehicular use is not always possible. However, they can still continue to serve when moved to bicycle paths and hiking trails. In some cases, a new bridge has been built beside the historic bridge, with the old one left to pedestrians and fishermen.

Few people wantonly destroy historic bridges. Their preservation in the United States requires the cooperation of transportation professionals with engineering expertise. Preservationists, architects, and historians cannot accomplish this alone. Bridges are engineered structures, and their successful rehabilitation requires the ingenuity of engineers.

Acknowledgments

The study by Chamberlin (2) served as the basis for this article. The authors also wish to acknowledge the help of the work by Jackson (4).

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DeLONY, HISTORIC AMERICAN ENGINEERING RECORD

Stonework being reassembled on Wilson's Bridge on Conococheague River near Hagerstown, Maryland. Scheduled for demolition following flood damage, this 1819 bridge was saved by efforts of team from Society for Industrial Archeology.

HAER Bridge Documentation Program

Since 1986, the Historic American Engineering Record (HAER) has worked with highway departments that have completed historic bridge inventories to document the most significant spans for the HAER collection at the Library of Congress. Since the establishment of HAER in 1969, more than 800 bridges have been documented. Highway departments find the HAER bridge documentation program to be a logical extension of their inventories. The documentation has also used a programmatic approach effectively. Instead of documenting structures on a bridge-by-bridge basis, packaging 20–30 bridges and recording them all at one time has proven productive. Recording costs are reduced from \$10,000 per bridge to \$2,000. The drawings, photographs, and reports produced by recording teams

are easily converted into exhibits and publications. The public education benefits of such recording projects can be considerable.

HAER is also documenting historic bridges in the National Park System. In the last three years, 43 bridges and other road-related structures were documented in the National Capital Region, including bridges along the George Washington Memorial Parkway in Washington, D.C., Colonial Memorial Parkway at Yorktown, and the C&O Canal in Maryland. In addition, 27 bridges on the Great Loop Road in Yellowstone National Park were recorded. The Valley Road, Tioga Pass Road, and 27 bridges, tunnels, and retaining walls in Yosemite National Park were recorded in summer 1991.

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