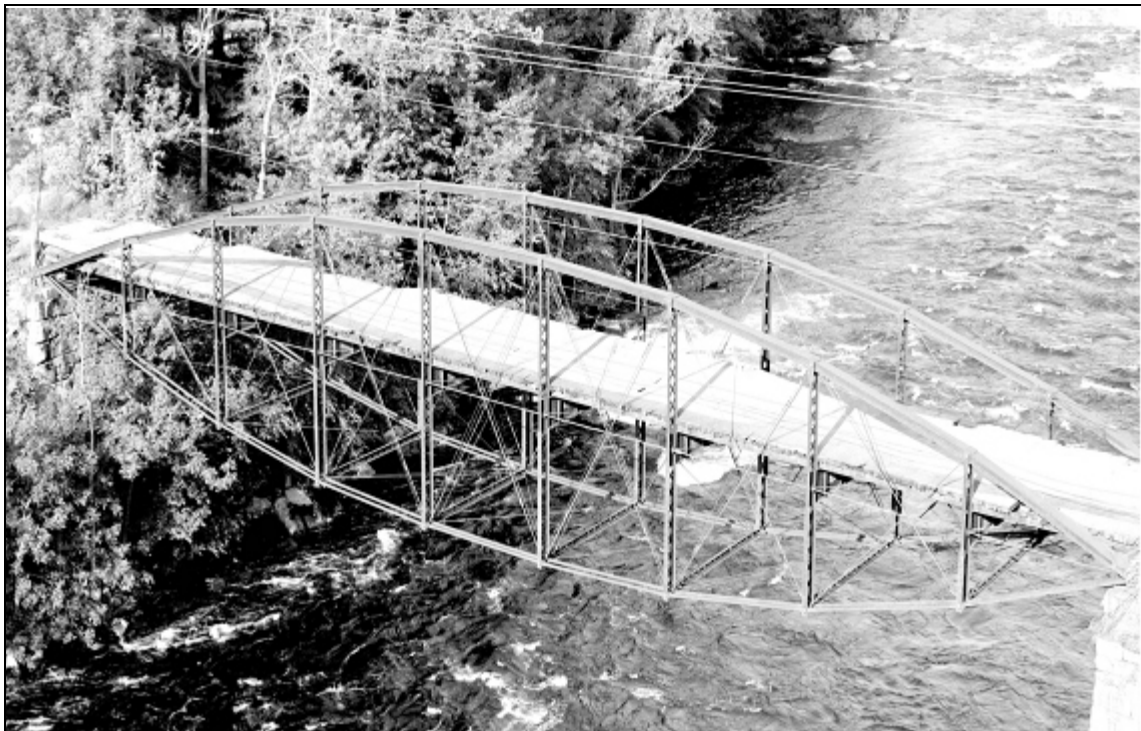


HISTORIC BRIDGES: A HERITAGE AT RISK
A Report on a Workshop on the Preservation and
Management of Historic Bridges
Washington, D.C.
December 3-4, 2003



by
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Note: The recommendations identified by participants at the December 2003 Washington, D.C. Workshop on Historic Bridges and presented in this report do not represent the official recommendations or opinions of the Federal Highway Administration, the Advisory Council on Historic Preservation, the National Park Service, any State Department of Transportation, the American Association of State Highway and Transportation Officials, the National Trust for Historic Preservation, or the National Conference of State Historic Preservation Officers.

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Cover Photograph: Bow Bridge (1885) spanning the Sacandaga River, Hadley (Saratoga County), New York. Photograph by Jet Lowe, Historic American Engineering Record photographer.

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INTRODUCTION

Since 1991, federal legislation has inspired an important transformation within the transportation community, broadening its mission from the traditional task of providing a safe and efficient highway system to acknowledging that these activities play a critical role in preserving our nation's natural and historical heritage.¹ Despite this cultural shift recent statistics suggest that half, if not more, of our Nation's historic bridges have been lost in the last twenty years - two decades in which transportation and preservation consciousness was at a high level. This is an alarming and sobering statistic. While we are not quite at the threshold of saving "the few surviving examples," we are fast approaching that point.

Clearly, the Historic Bridge Program (Section 144(o)) enacted in 1987 (in the Surface Transportation and Uniform Relocation Assistance Act (STURAA)) is not working to stem the loss of historic bridges. Hence, the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), the SRI Foundation, the National Trust for Historic Preservation (NTHP), and the Historic American Engineering Record (HAER) of the National Park Service (NPS) organized an invitation-only workshop of experts to articulate and define the issues confronting historic bridges. The workshop was held in Washington, D.C. on December 3-4, 2003. In the spirit of stewardship, streamlining, and sound environmental and historic bridge management, the goal of the workshop was to provide federal and state transportation agencies, the Congress, and the interested public with recommendations and solutions on how to preserve this heritage at risk. Specifically, the purpose of the workshop was to articulate and define efficient and economical strategies for historic bridge preservation and management.

This report summarizes the issues, initiatives and recommendations that came out of the Washington, D.C. workshop.

BACKGROUND

America's historic bridges date back as far as the 17th century (Frankford Avenue Bridge (1697), Philadelphia), and extend up to modern suspensions (George Washington Bridge (1931), New York), concrete (Rogue River Bridge (1932), Oregon), and moveable spans (Chicago Bascules, 1920s and 30s). Historic bridges also are the single most visible icon of highways and civil engineering art. Bridge building evolved over the last two hundred years, driving some of the most important developments in structural engineering design and material technology. Examples from all periods remain, but many have an uncertain future.

To this end, about twenty years ago, under direction from the Federal Highway Administration, most states began inventorying and identifying their historic bridges to determine which ones were eligible for listing on the National Register of Historic Places. This major first step is

¹ Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA).

nearing completion. Significant progress has also been made by increasing the awareness of transportation departments, Congress and the public on the value that bridges hold for the historic built environment and the quality of life in our communities and urban centers. One only has to look at the number of historic bridges that have been saved to realize the potential that bridges hold for creating a unique sense of place, identity and amenity, for both urban and rural landscapes. Rehabilitating historic bridges not only saves significant historic resources, but can be economically rewarding and a sound engineering practice. Some of the most innovative, cost effective engineering practices are represented by rehabilitated historic bridges. Despite these successes, recent statistics, as noted above, suggest that our historic bridges remain at risk.

THE WORKSHOP

Individuals involved with developing the 2003 workshop included Mary Ann Naber, Preservation Officer, Federal Highway Administration; Dan Costello, Senior Program Associate (retired), Department of Public Policy, National Trust for Historic Preservation; and Eric DeLony, Chief (retired), Historic American Engineering Record (HAER), National Park Service. The two day workshop was facilitated by Terry Klein, Executive Director, SRI Foundation, Rio Rancho, New Mexico. The workshop was convened under the premise that if you get thirty smart people together for a couple of days, some interesting ideas and innovative solutions will emerge. The invited experts included a blend of civil engineering educators, historic bridge scholars, and transportation, environmental and preservation professionals working at federal, state and municipal levels. See Appendix A for a list of the participants.

Prior to the workshop, a questionnaire was circulated to obtain general information on the nation's historic bridges, and to get some sense of how state Departments of Transportation (DOTs) are dealing with these historic resources. The questionnaire was sent to all 50 state DOTs, selected State Historic Preservation Officers (SHPOs), several consulting engineers experienced in historic bridge rehabilitation, a couple of civil engineering educators interested in the subject, and several non-engineering preservationists and historic bridge scholars. Thirty-seven DOTs responded, including the District of Columbia.

The intent of the questionnaire was to develop quantifiable information on the nation's historic bridges, confirm the issues enveloping historic bridges, and to help shape the agenda and discussion topics for the workshop.² While the responses confirmed the threat to the nation's

²The results of the questionnaire were corroborated by two recent studies: *Survey of Selected States with Historic Bridge Management Plans*, completed in June 2001 by Mead & Hunt and Allee King Rosen & Fleming, Inc. (AKRF), as part of a contract to survey the historic bridges and develop a management plan for New York State. Nine states (CT, GA, MT, NJ, OH, PA, TX, VT, VA) were queried as part of their study. The other is *A Comparative Summary of Statewide Historic Bridge Management Planning Efforts*, completed in March 2001, by Mitzi Rossillon, Renewable Technologies, Inc., of Butte, Montana, for the North Dakota Department of Transportation as part of a similar contract for that state. Two other relevant studies, both by William P. Chamberlin, PE (Retired), New York State Department of Transportation, are

historic bridges, it also revealed several innovative approaches to saving these historic spans. Analysis of the questionnaire responses is included in Appendix B.

The core of the workshop involved a group discussion on the problems associated with historic bridge preservation and management, leading to a consensus on the key components of these problems, followed by small breakout group discussions (brainstorming) to identify solutions to these problems. At the end of the second day, the breakout groups reconvened as one, presented their solutions, and agreed on a set of recommendations to streamline and enhance historic bridge preservation and management nationwide. The following is a summary of these recommendations.

RECOMMENDATIONS

1.) Mandate the Development of Historic Bridge Management Plans. Just about everything under the sun concerning historic bridges was touched on over the two days. There was, however, little debate or difference of opinion that the primary recommendation to FHWA, the Congress and the states, is to mandate the development of historic bridge management plans. The group felt that management plans are seminal to saving historic bridges, serving as the umbrella under which other actions, such as Programmatic Agreements (PAs), best practices examples, and improving data accessibility, would insure the preservation of the Nation's historic bridges. Management plans should be "bridge-specific" rather than a series of vague, general recommendations. Every attempt should be made to identify those bridges where rehabilitation/preservation is appropriate and feasible, and to develop specific treatments for these bridges. This recommendation logically follows completion of the statewide historic bridge inventories. As one participant succinctly stated, "Now that we have identified all these wonderful spans, what do we do with them?"

It was the consensus of the group that management plans would go far toward protecting historic bridges.

2.) Create a National Historic Bridge Task Force whose members would include representatives from all of the organizations represented at the workshop: National Conference of State Historic Preservation Officers (NCSHPO), DOTs, American Society of Civil Engineers (ASCE), National Association of County Engineers (NACE),³ bridge engineers, engineering

NCHRP Synthesis 275: Historic Highway Bridge Preservation Practices and, *Historic Bridges-Criteria for Decision Making: Synthesis of Highway Practice 101*, both published by the Transportation Research Board, National Research Council, Washington, DC, in 1999 and 1983 respectively.

³NACE was specifically identified as a vital constituent of the task force because it is imperative that county and municipal engineers are informed and knowledgeable of historic bridges. (It was pointed out that this should include county commissioners). So many historic bridges are located on county and municipal roads, a number of which are not part of state-aid or federal systems. Frederick (Maryland) County engineer, Ken Harwood, is preparing an article about

educators, and historic bridge preservationists. Most of the workshop participants volunteered to serve as the initial members of this Task Force

The Task Force would meet at selected national meetings, such as the annual or summer meetings of the Transportation Research Board (TRB) and similar venues (where possible), and through virtual meetings/conference calls to act on the recommendations of the workshop, to monitor the implementation of these recommendations, and to keep tabs on the state of the nation's historic bridges.

To this end, the group identified the need to develop a Task Force Mission Statement. This statement is based on the brainstorming ideas transcribed on flip charts during the workshop, and ASCE's policy statement on the rehabilitation of historic bridges approved by ASCE's Board of Direction at their annual meeting in November 2003 (See Appendix C for the ASCE policy statement). The Task Force mission statement is as follows:

The National Historic Bridge Task Force is a new alliance of engineers, historic preservation professionals and transportation planners that supports the preservation of historic bridges in the United States. The task force will work with public agencies and private interests to preserve significant bridges through:

- **Advocacy - providing a strong voice in support of policies and initiatives favorable to the preservation and management of historic bridges.**
- **Technical assistance - improving access to information, best practices and training on bridge rehabilitation, reuse and maintenance techniques.**
- **Education - by encouraging broader appreciation of the value of bridges as links to our cultural past and icons of transportation and engineering history.**

With current public interest in scenic highways and byways and strong federal and state support for these linear systems, it was suggested that bridge interests (e.g., the National Historic Bridge Task Force) need to seek out and link up with scenic highway and byway interests. For example, Oregon links design flexibility to bridges on scenic highways such as the Columbia River Gorge and Coastal Route 101. This is a logical suggestion since bridges are one of the indelible features of roads, and in some cases, form the single most visible icon of historic road systems.

3.) Develop a National Cooperative Highway Research Program (NCHRP) synthesis to explore the decision making process on rehabilitating or replacing historic bridges. DOTs need effective models and guidance for complying with the requirements of the National Environmental Policy Act (NEPA), Section 106 of the National Historic Preservation Act, and Section 4(f) of the Department of Transportation Act, when making the decision during the

this workshop that will be published in the National Association of County Engineer's newsletter.

project development process on whether or not a historic bridge will be rehabilitated or replaced.

Workshop participants will work to get the AASHTO Bridge Committee and the Standing Committee on the Environment (SCOE), NACE, ASCE, NCSHPO and other groups to show NCHRP their support for the synthesis. In addition, workshop participants from state DOTs will urge their respective agencies to support the synthesis proposal.

4.) Task Force would work to increase and enhance funding for historic bridge management and preservation, partnering with advocacy groups. Funding is essential to accomplish just about anything including the preservation of historic bridges. Funding to rehabilitate historic bridges has been available through the Highway Bridge Replacement and Rehabilitation Program (HBRRP), Transportation Enhancements, and Save America's Treasures grants. There are however constraints to using federal funds to rehabilitate historic bridges. Over the years, restrictions on the use of other Title 23 funds have stymied the use of these funds for bridge rehabilitation. For bridges that could be rehabilitated, but not remain in vehicular service, the amount of funding available through HBRRP was limited to the estimated cost of demolishing the bridge. Once these funds were drawn down, however, no other Title 23 funds, including Transportation Enhancement dollars, could be used. For example, preservationists working to save the 10th Street Bridge in Great Falls, Montana, successfully won a \$250,000 Save America's Treasures grant. The estimated costs of rehabilitation, however, came in over \$3 million resulting in a tremendous fund raising burden on a small preservation group. Workshop participants pointed out that while the estimated costs of demolition may assist towards relocating a bridge, once the bridge is relocated, there is no money left for rehabilitation.

Proposed language in the Administration's **Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003** (SAFETEA) provides some relief. Section 144(o)(4) of title 23, the *Historic Bridge Program*, would be amended by adding the words "200 percent" after "amount not to exceed," and replaces the word "title" with the limited section reference. This corrects a conflict with the use of transportation enhancement funds for bridge preservation and increases the allowable limits under the Highway Bridge Program.

The **National Historic Covered Bridge Preservation Program** has been extremely successful in helping save the Nation's covered bridges. Twenty-six million dollars has been appropriated over the last three years. A policy and funding strategy that was suggested by the workshop participants would be to extend the national covered bridge program to include other historic bridges, such as metal-truss spans.

5.) Develop a national glossary for historic bridges that would be posted on a clearing house web site. Data accessibility was identified as a critical need by all attending the workshop. Though many states are developing geographic information systems (GIS) for historic bridges and other cultural resources, the common language for discussing and describing historic bridges varies from state to state, thus making it difficult if not impossible to retrieve information on historic bridges through electronic databases. Workshop participants recommended the development of a glossary of terms, nomenclature, or key words describing

bridges that would be common to all states thus facilitating research and retrieval regardless of the state in which a bridge is located. Sources to be used to develop a common glossary describing historic bridges would include Pennsylvania DOT's historic bridge glossary; Lichtenstein Consulting Engineers' and the Louis Berger Group's *Techniques & Methodologies to Rehabilitate Historic Bridges on Low Volume Roads*, now in final editing and production; and HAER's Historic Truss Bridge Poster.

6.) Develop a National Context on Historic Bridges. The workshop participants reiterated the lack of a national historic context on historic bridges as a common and recurring problem thwarting the evaluation and treatment of historic bridges. As defined in the *Secretary of the Interior's Standards for Historic Preservation Planning*, a historic context is a "unit created for planning purposes that groups information on historic properties based on shared themes, specific time period and geographic area." Further, "a single historic context describes one or more aspects of the historic development of an area, considering history, architecture, archaeology, engineering, and culture; and identifies significant patterns that individual historic properties represent ..." It was suggested during the workshop that transportation funding could be used to develop a national historic bridge context so that information could be made available to all the states, facilitating the evaluation and treatment of historic bridges at both the state and national levels.⁴ It was pointed out that current cooperative efforts to develop computerized inventories and geographic information systems that map the location of historic bridges could be even more useful if they were tied to historic contexts.

To develop a historic context, the National Register recommends using the *multiple property documentation format*. The format calls for a statement explaining one or more historic contexts, the identification of associated property types, evaluation criteria to identify what characteristics a property must have to be eligible for the National Register under the historic context, a summary of identification and evaluation methods, and bibliographical references.⁵ The workshop participants recommended examining existing historic bridge surveys to see if there is enough information available to develop a historic context. Funding sources to develop a historic context for bridges might include FHWA or TRB research funding.

7.) Information Management. The need to organize all the data that have been collected as a result of the statewide historic bridge inventories over the past 20 years is recognized by all involved in bridge preservation and transportation projects. This was succinctly pointed out in a memo by James Garvin, New Hampshire State Architectural Historian, and circulated during the

⁴NCHRP has recently implemented Project 25-25, Task 15: **A Historic Context for Historic Bridge Types**. The goal of this 12-month study is to develop a historic context for the most common 50 historic bridges in the country.

⁵This recommendation reinforces similar recommendations made during the *National Forum on Assessing Significance for Transportation Programs* held in Washington, DC, May 23-25, 1999. The central concept woven through everything that happened at this forum was "historic context." The report from this forum, *Transportation Circular Number E-C055*, was published by TRB in August 2003.

workshop by New Hampshire DOT bridge engineer Dave Powelson.⁶

It should be noted that we really don't know how many "historic bridges" there are, or how many have been demolished. Information is, at best, anecdotal, not statistical. Therefore, it is very important to develop quantifiable information for completing any statistical analyses on the status of the nation's historic bridges. This report acknowledges this deficiency, recommending that one of the first goals of the Historic Bridge Task Force is to address this issue.

To this end, the workshop participants suggested examining existing statewide historic bridge surveys to determine how states can organize information on historic bridges in a meaningful manner. This effort would enable the development of management plans that would establish priorities for preservation based on a national historic bridge context. Together, these surveys represent a wealth of information and data, but it will take time and money to bring it all together. Should a national context be developed, it would be possible to compare and evaluate bridges on a regional or national basis. Funding could then be targeted toward bridges with the greatest historical significance or most feasible preservation priorities.

8.) Develop a Web Site on the management and preservation of historic bridges. The vision here is a national clearinghouse that would enable "one-stop shopping" for contacts, information, and technical resources on anything pertaining to historic bridges. One possible venue suggested for the web clearinghouse is Cleveland State University's, tentatively titled, "Wilbur J. and Sara R. Watson Bridge Rehabilitation Topics and News." Cleveland State University Libraries recently received the complete book collections of the bridge historian, Sara Ruth Watson and her father, the well-known bridge engineer Wilbur J. Watson, as well as a major endowment from the estate of Sara Watson, for the purpose of promoting scholarly activities on bridges. An advisory committee for the collection has recommended building and maintaining a reliable, state-of-the-art information resource on bridge rehabilitation. Bridge designers have a real need for a comprehensive, reliable information resource on bridge rehabilitation. Most civil engineering curricula do not provide academic courses on material degradation processes, nor on structural assessment and rehabilitation technologies. A state-of-the-art, accessible resource will improve engineers' ability to make decisions on rehabilitation versus replacement, especially for culturally important components of our built infrastructure. The website being proposed is important and relevant to bridge designers. It can be the lasting, influential legacy of two devoted "pontists", Wilbur J. and Sara R. Watson.

Another venue for the web site is the Historic Bridge Foundation, an organization founded in 1998 "that advocates for the preservation of cultural and engineering landmarks, and the

⁶Jim Garvin's memo is included as Appendix D. It should be pointed out that none of the State Historic Preservation Officers invited were able to attend or send representatives, the reason being on-going commitments and restrictions to travel outside of the state, though the Executive Director of the NCSHPO did attend the workshop. Workshop organizers were concerned that no SHPOs were able to attend the workshop. Effective historic bridge programs need the participation and interest of SHPOs.

communities and people that built them.” According to their web page, the Historic Bridge Foundation serves as a clearinghouse for information on the preservation of endangered bridges, provides assistance towards listing bridges on National Register of Historic Places, assistance on completing grant applications for bridge preservation projects, consults with public officials to devise reasonable alternatives to the demolition of historic bridges, and develops educational programs to promote awareness of historic bridges.

To develop such a web site, possible sources of funding include FHWA stewardship and streamlining funds or a grant from the National Center for Preservation Technology and Training (NCPTT). In addition to the obtaining funds to develop the web site, the workshop participants thought there needed to be an endowment to maintain the web site. Once it was up and running, it needs a web master and committee dedicated to updating and maintaining the content of the site. The committee could come from the proposed National Historic Bridge Task Force.

9.) Improve State DOT management and tracking of the status of historic bridges. (Use FHWA mandates similar to creation of statewide historic bridge inventories). The workshop participants agreed that data accessibility and the ability to better track information on the status of historic bridges is a critical need.⁷ This deficiency became evident through the questionnaire - the reason being that most of the inventories completed in the 1980s were paper-based, where the data were not tabulated into a computerized format. This is understandable since databases were not as sophisticated and user friendly twenty years ago as they are today.

A further illustration of this problem is that two states with perhaps the most significant populations of historic bridges - Pennsylvania and New York - could not tell the workshop organizers how many historic bridges had been lost in the last twenty years. Both states have only completed comprehensive, computerized surveys in the last few years. Though half the states are developing a GIS for managing data on historic bridges, the survey questionnaire results suggests that better record keeping and more easily accessible databases are key to managing historic bridges. This was identified as a long term effort. An excellent example of an innovative historic bridge GIS database is the program developed by Arkansas State Highway and Transportation Department.

Another poignant illustration of this problem was given by Jim Cooper, a bridge preservationist from Indiana. He stated that in Indiana, “[w]e have lost very few covered timber-truss structures in the last ten years (maybe 8 or 9 down to 92). We have lost probably two dozen National Register Eligible concrete structures in a decade. The rate is now accelerating. The losses are different for metal trusses: Over two-thirds of the metal bridges I surveyed in 1984 are now gone. I doubt that anyone at INDOT could, for example, report the data I have just provided here. No one there keeps track of such things...”

⁷This critical need also was identified by the 1999 “Forum on Assessing Historic Significance.” See *Transportation Research Circular No. E-C055*, p.14. The Mead & Hunt/AKRF survey confirmed that there are problems tracking costs of rehabilitating historic bridges.

States need minimal, but standardized, data entry to enable a system that could link all information, not just site locations, to a common geographic reference point. The information should be linked to site files, photographs, HAER reports, National Register nominations, etc. so that eventually, state information could be accessed at a national level to get a national or regional view of the status of historic bridges. Recording minimal data or information in a database should be done by cultural resource management staff of DOTs in order to maintain a consistent quality of information. State historic bridge management plans should include provisions for these types of management mechanism.

10.) Collection and distribution of technical guidance on historic bridge rehabilitation and maintenance. This was the last primary recommendation made during the workshop, and it is related to the other recommendations. This action item is linked to the NCHRP historic bridge rehabilitation synthesis, Item 2 above. The New Jersey DOT, Maryland State Highway Administration and Texas DOT have developed maintenance manuals for their historic bridges. These manuals would be posted on the proposed historic bridge web site. Another technical document that would be included in the web site is FHWA's *Techniques & Methodologies to Rehabilitate Historic Bridges on Low Volume Roads*, presently in draft form and being reviewed by the agency.

Once these and related documents are posted on the web site, a second step would be to see if there is a need to create some type of historic bridge engineering manual. Such a manual would also be posted on the web site. In addition to paper formats, it was pointed out by workshop participants that all of this information must be formatted as a CD and made available to historic bridge preservationists and engineers.

NEXT STEPS

Clearly, it is not possible to implement all of these recommendations at the same time, nor can one group of individuals, such as the National Historic Bridge Task Force, be responsible for carrying out all of these recommendations. One suggestion offered by workshop participants was to prioritize the recommendations and then form volunteer committees within the Task Force to work on a set of the recommendations. One group of workshop participants is already working on the development of a NCHRP synthesis problem statement to explore the decision making process on rehabilitation versus replacing historic bridges. It is hoped that this statement will be submitted to NCRHP by the fall of 2004. This ad hoc committee is also exploring other funding mechanisms if the study is not taken on by NCHRP.

The SRI Foundation will serve as the venue for continued and regular communication among Task Force members until another "home" for the Task Force is identified. After the release of this report, Task Force members will be contacted via email in order to create committees to begin to address the workshop recommendations, and to prioritize these efforts. If possible, Task Force committee members will meet at the various historic preservation and transportation meetings that occur throughout the year in order to begin to implement some of the workshop's

priority recommendations.

Several workshop participants planned on returning to their respective agencies to begin to implement some of the recommendations developed during the workshop. Therefore, individuals will also be advancing some of these recommendations in the context of their own agencies and organizations. These individual efforts will be tracked through regular communication among the Task Force members.

The SRI Foundation will also be showcasing the results of this workshop at annual transportation and historic preservation conferences and meetings throughout the year (e.g., the 2004 Historic Roads Conference, the 2004 annual meeting of AASHTO's Standing Committee on the Environment, and the 2004 summer workshop of TRB's Committee on Historic and Archaeological Preservation in Transportation). The goal is to network with agencies and individuals who can assist in advancing the workshop recommendations, in addition to bringing other professionals into the Task Force.

In summary, it is hoped that the recommendations presented in this report will assist in the preservation of the Nation's historic bridges. Implementation of these recommendations should result in more streamlined and efficient transportation policies and practices, and the rehabilitation and maintenance of our Nation's historic bridges. These efforts will in turn enhance the communities served by this important infrastructure.

APPENDIX A – LIST OF WORKSHOP PARTICIPANTS

**WORKSHOP ON THE MANAGEMENT AND PRESERVATION OF HISTORIC
BRIDGES IN THE UNITED STATES:
A HERITAGE AT RISK
DECEMBER 3 – 4, 2003,
WASHINGTON, D.C.**

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APPENDIX B – RESULTS OF QUESTIONNAIRE/SURVEY

HISTORIC BRIDGES: A HERITAGE at RISK
A Workshop on the Preservation and Management of Historic Bridges
Washington, D.C., December 3-4, 2003

ANALYSIS OF QUESTIONNAIRE

Prior to the workshop, we sent out a questionnaire to obtain general information on the nation's historic bridges, and to get some sense of how state Departments of Transportation (DOTs) are dealing with them. The questionnaire was sent to all 50 state DOTs, several consulting engineers experienced in historic bridge rehabilitation, a couple of civil engineering educators interested in the subject, and several non-engineering preservationists and historic bridge scholars. Thirty-seven DOTs responded, including the District of Columbia. The intent of the questionnaire was to develop quantifiable information on the nation's historic bridges, confirm the issues enveloping historic bridges, and to help shape the agenda and discussion topics for the workshop. We were extremely gratified to hear back from so many respondents. While the responses confirm the threat to the nation's historic bridges, they also reveal several innovative approaches to saving these historic spans. The following is an analysis and interpretation of the questionnaire. Please take time to review this analysis. Your interpretation of the responses will contribute to the success of the workshop.

QUESTIONS & RESPONSES

1.) Most states have completed statewide historic bridge inventories. Surface transportation legislation (STURAA) mandated completion of the inventories in 1987. How many bridges in your state are listed or have been determined eligible for the National Register?

Most states completed their initial surveys in the early-1980s with the Commonwealth of Virginia leading the pack. Subsequently, most states completed "upgrades" in the late-1990s incorporating post-WW II and pre-interstate era bridges. According to the responding DOTs (37 including the District of Columbia), there are 1,668 bridges listed and 6,014 bridges determined eligible for the National Register.

[Note: The National Register's database shows 2,300 listed-bridges for all fifty states, including Guam, Puerto Rico and the District of Columbia, and 841 bridges that have been determined eligible. There are eleven (11) bridges designated as National Historic Landmarks. The National Register explains that since formal determinations of eligibility (DOEs) come to the National Register in all shapes and forms, data on DOEs are inaccurate. The National Register is comfortable, however, with the accuracy of the number of bridges actually listed. It should be noted that there are discrepancies between the number of National Register-listed bridges reported by the state DOT's on the questionnaire and the National Register's database. The reasons for these differences are not clear at this time.]

2.) During a Colorado Preservation, Inc. conference two years ago, we learned that over half that state’s historic bridges had been lost in the last twenty years.

To learn whether this alarming statistic was consistent with the other states, we asked respondents to tell us how many historic bridges have been destroyed over a similar period of time. It seems that the loss of historic bridges may not be as grave as originally anticipated. For those states that have good hard data, the rate of attrition is more like 25% rather than 50%.

While most states have complied with STURAA, two states have no survey to date - Louisiana, and Utah, and the District of Columbia.

[Note: However, this percentage comes with several significant qualifications - one being that many of the earlier surveys only looked at state and federal-aid road bridges and not the locally and municipally owned bridges. Many of the unique, one-of-a-kind bowstring arches, metal trusses and early concrete spans are located on the secondary farm-to-market roads. Another reason to question this percentage is that many of the earlier surveys were “paper” inventories where the data were not tabulated in a computerized database. This is understandable since databases were not as sophisticated and user friendly twenty years ago as they are today. This brings into question the accuracy of data from some of the states. An illustration of this is that two of the states with significant populations of historic bridges - Pennsylvania and New York - can not tell us how many historic bridges have been lost in the last twenty years. Both states have only completed comprehensive, computerized surveys in the last few years. Virginia has no data on the fate of its historic bridge before 1990. The survey suggests that better record keeping and more easily managed databases are key to managing historic bridges.

Concerning the questionnaire, Jim Cooper, a bridge preservationist from Indiana, stated that in Indiana, “[w]e have lost very few covered timber-truss structures in the last ten years (maybe 8 or 9 down to 92). We have lost probably two dozen National Register Eligible concrete structures in a decade. The rate is now accelerating. The losses are different for metal trusses: Over two-thirds of the metal bridges I surveyed in 1984 are now gone. ... I doubt that anyone at INDOT could, for example, report the data I have just provided here. No one there keeps track of such things...”]

3.) Some states have implemented or are developing historic bridge management and preservation plans. Do you have a plan in place? Are you currently working on a plan?

Of the 37 states responding, 12 have management plans in place, and 14 are either working on or contemplating developing one. Wisconsin has a plan for its bascule bridges. Pennsylvania is working on a plan for its masonry arch bridges.

4.) Does the plan include provisions for routine maintenance?

Thirteen (13) of the states responding include maintenance as part of the plan.

5.) Several states have orphan bridge or adopt-a-bridge programs. If you have such a plan, how many bridges have successfully been saved or adopted on an annual basis since the program was implemented?

Twelve (12) states indicated that they have a marketing, orphan, or adopt-a-bridge program. Tennessee was one of the first to aggressively promote such a program and, over the last 22 years, has marketed 24 bridges. For the other states, the number of bridges marketed ranges from 3-4 per year to somewhere between 1-5 per decade. South Dakota and Pennsylvania have found that its marketing programs are not very successful.

6.) To maintain its backcountry roads and New England townscapes, the state of Vermont has adopted in-state design standards for its roads and bridges. Does your state have in-state design standards?

Ten (10) of the 37 states noted that they have in-state standards. Three (3) states indicated they plan to develop such standards. Kentucky stated that it uses “context sensitive design” in dealing with historic bridges.

7.) Do you provide any special assistance to counties responsible for historic bridges?

Fifteen (15) states indicated that they provided assistance to county entities. This question was included because many historic bridges exist on local and municipal roads not falling under direct state jurisdiction, and local and county engineer play a significant role in preserving these resources.

8.) Most states adhere fairly closely to AASHTO standards. Does your state exercise any flexibility or have specific policies for dealing with historic bridges?

Responses indicate that a surprisingly high percentage (66%) of the states (23) stated that they exercise design flexibility in dealing with historic bridges. Oregon links design flexibility to bridges on scenic highways such as the Columbia River Gorge and Coastal Route 101.

9.) In general, does bridge replacement occur more often than bridge rehabilitation?

As suspected, 25 of the 37 state DOTs, including the District of Columbia, say that replacement far outweighs rehabilitation. Indiana DOT says that more bridges are replaced when paid for by federal funds. Maryland says that while more bridges were replaced in the past, it feels more will be rehabilitated in the future. Again, many states were not able to answer this question definitively because they are unable to track past actions involving historic bridges.

10.) Is there an engineer or staff within your agency who you would consider expert on rehabilitating historic bridges?

Twelve (12) states indicated that they have engineers or staff with expertise in historic bridges.

California - Dave Stow, PE
Connecticut - Timothy Fields, PE
Louisiana - Gill Gautreau, PE

Maryland - John Hudacek, PE
Michigan - Margaret Barondess
New Hampshire - Dave Powelson, PE
New Jersey - Lichtenstein Consulting Engineers
Oregon - Frank Nelson, PE
Texas - Charles Walker, PE
Vermont - Dave Hoyne, PE, Gilbert Newbury, PE
Virginia - Tom Lester, PE, Park Thompson, PE, Nick Nicholson, PE
West Virginia - Terry Bailey, PE

[Note: We would like to add two county engineers, to remind us of the role local engineers have in saving historic bridges: Frederick County, Maryland - Ken Harwood and Calhoun County, Michigan - Dennis Randolph, PE. Undoubtedly, there are more qualified individuals in both categories.]

11.) Do you have an education/information outreach program informing citizens of the state's historic bridges - that is, a way to obtain citizen and community input into the proposed rehabilitation or replacement of an historic bridge?

Twenty-one (21) of the states noted they had some form of educational outreach pertaining to historic bridges. Kentucky responded that it relied on the State Historic Preservation Officer (SHPO) for these services. Others relied on web sites and the normal Section 106 consultation process. Indiana has a special program informing Hoosiers of the state's covered bridges.

12.) Have you sponsored or funded the rehabilitation of an historic bridge in the last twenty years?

Every state that responded, with the exception of two (New Mexico and Utah), stated that they had rehabilitated an historic bridge sometime during the last twenty years. Few states could provide specifics on the costs or level of rehabilitation due to limited record keeping. States with significant populations of covered bridges specifically mentioned special programs dealing with these spans. The fact that most states have rehabilitated historic bridges indicates that some think that this is a viable engineering and economical alternative. Vermont stated that rehabilitation often resulted in substantial savings, as did the county engineer from Frederick County, Maryland.

Bridges rehabilitated ranged from massive structures such as the Cotter Bridge (1930) in Arkansas to simple through trusses, concrete slabs and arches. Particularly notable is the rehabilitation work that Oregon DOT has done on the large coastal bridges designed by state bridge engineer Conde McCullough, bridges on the Columbia River Gorge Scenic Highway, the state's covered bridges, and some of the major moveable spans over the Willamette River in Portland.

[Note: It is clear that there is no shortage of outstanding examples of historic bridge rehabilitation throughout the country. However, there is a paucity of case studies outlining rehabilitation techniques

and costs. FHWA contracted with the Louis Berger Group several years ago to produce a best practices handbook, but it has not been completed. Having case studies in-hand certainly would assist in and stimulate similar treatments in other parts of the country.]

13.) Speaking with individuals in state DOTs, there is concern of a "disconnect" between environmental and engineering interests and disciplines. Could you characterize the relationship between these two disciplines in your agency?

This is a touchy issue confirmed by many equivocal responses from the state DOTs. Though many states indicated that relationships were improving, eight states responded that there was a "disconnect." In some states, environmental and preservation interests were still perceived as "scapegoats," something extra and not necessary. Other respondents cited different value systems between the two disciplines as one of the reasons for this disconnect.

Despite the prevalence of engineering interests and the lack of interest to pursue alternative or non-traditional methods, many respondents said that relationships were improving because of better understanding of the respective disciplines. Some of the reasons for improvement included the intervention or mediation by the FHWA division office, change of leadership within the agency, the attitude of individual project managers, context sensitive design, and the integration of environmental and engineering disciplines within the same office. Vermont claimed that its historic bridge program helped instill a measure of pride among the engineers on staff.

14.) Funding, tort liability, and the lack of community interest have been cited as reasons for not rehabilitating historic bridges. Please confirm if these are true adding other reasons that have mitigated against preservation. Concerning liability, please differentiate between perception and actual cases where an historic bridge actually resulted in a successful law suit against the state or local authority.

14a.) Which of the following has been cited most frequently in your state as the reason for not rehabilitating historic bridges. If more than one reason has been cited with equal frequency, please check all the reasons: funding, tort liability, lack of community interest, other (please describe).

Twenty-nine (29) of the states responded that funding is the primary reason that historic bridges are not rehabilitated. Fifteen (15) states cited tort liability as a reason, and eleven (11) the lack of community interest.

[Note: Preservationists working on the 10th Street Bridge in Great Falls, Montana discussed with Eric DeLony the problem associated with restrictions on the use of federal funds when restoring historic bridges. Though this issue was not on the questionnaire, it is a significant enough issue to include in this analysis. As noted on FHWA's *Re:NEPA* web page (this past spring), Federal funds may be utilized if the deficient aspects of the bridge are no longer deficient after the project. If the bridge is taken out of motorized vehicle use, funds up to the cost of demolition may be used for preservation (23 U.S.C. 144(o)).]

14b.) If you checked “tort liability,” how many lawsuits involving historic bridges have been successfully brought against your agency over the past five years? Number of cases.

No state could identify a single instance when it was sued because someone lost a life, personal property or experienced an injury due to a deficient historic bridge. Tort liability will always be a concern, but this survey brings into question the use of tort liability as a reason for not rehabilitating an historic bridge.

Other reasons noted by the respondents included safety, capacity, service life, poor condition, functional and structural obsolescence, geometrics, AASHTO standards, maintenance, future costs, school buses, emergency and farm vehicles, and comparative costs between old and new structures.

15.) On the other hand, what has been the fundamental reason(s) that historic bridges have been saved?

By far, community interest was the primary factor, noted by thirty-one (31) of the states. Thirteen (13) cited flexible design standards and three mentioned adopt-a-bridge programs. Nine (9) states cited their historic bridge management plans as the reason bridges were saved.

Many states cited the Section 106 compliance process. One reason cited for successful rehabilitation involved someone on the DOT staff or a focused, passionate citizen or citizen’s group willing to make a conscience effort to save a bridge. Other reasons mentioned included SHPO interest, the availability of transportation enhancement funding, and the obvious cost effectiveness of rehabilitation.

Innovative Programs: Please provide any additional comments you may have on your bridge program. Does your state have a program that you would consider innovative in dealing with historic bridges? For example, Virginia and Texas have come up with specific bridge management plans that guarantee the preservation of selected bridges. Oregon DOT has an in-house SWAT team responsible for the inspection and maintenance of its legacy of Conde McCullough coastal bridges.

Arkansas has developed a GIS system to manage, market and mitigate impacts to its historic bridges. California cited its seismic retrofit programmatic agreement following the Loma Prieta earthquake. Rehabilitation of the fifteen City Beautiful bridges, designed by city engineer Merrill Butler, spanning the Los Angeles River in downtown Los Angeles is an outstanding example of this program. Connecticut has design guidelines that protect the rustic, Art Deco and Modern bridges on the Merritt Parkway. Georgia cited its covered bridge program; and this would probably hold true for other states with significant populations of covered bridges. Though the Georgia program started before the National Covered Bridge Preservation Program went into effect three years ago, the national program has been extremely important for

preserving the nation's covered bridges.

Michigan cited the Calhoun County Bridge Park, the first in the country. Ohio has one of the oldest historic bridge programs in the country, having initiated one twenty-six years ago in addition to having a programmatic agreement in place for the last ten years. Oregon has its in-house SWAT team for historic bridge maintenance who are responsible for the cathodic protection of the McCullough coastal bridges, historic bridges on the Columbia River Gorge Scenic Highway and the state's covered bridge program. Pennsylvania cited its stone-arch bridge program as a pilot for dealing with its other historic bridge types. Tennessee cited its twenty year old marketing program. Texas has developed an in-house Historic Bridge Team and has funded the rehabilitation of ten bridges. TxDOT has also produced an historic bridge manual, is exploring a scenic bypass program so that bridges can remain in vehicular use on scenic byways, and has a program that requires a maintenance agreement with bridge owners when a bridge is set aside for non-vehicular use. Virginia has a comprehensive management plan for its sixty three (63) National Register listed and eligible bridges, and the plan includes regular maintenance. It also has a "RRR," Rural Rustic Roads program, whereby minimal rehabilitation is done on rural bridges other than making sure the bridges are safe. The management plan constitutes a public statement of VDOT's intentions to manage and preserve the state's historic bridges. West Virginia cited its covered bridge program. Vermont has what is most likely the most comprehensive programmatic agreement and historic bridge management program in the country.

Most states responding to the questionnaire (24), however, did not feel they had any innovative programs.

[Note: We should also mention that several counties have outstanding historic bridge management programs, such as Frederick County, Maryland; Calhoun County, Michigan; Hunterdon County, New Jersey; and Ashtabula County, Ohio. These are ones that are best known though there probably are others.]

**APPENDIX C – AMERICAN SOCIETY OF CIVIL ENGINEERS POLICY
STATEMENT ON HISTORIC BRIDGES**

Policy Statement
American Society of Civil Engineers

REHABILITATION of HISTORIC BRIDGES

Policy:

The American Society of Civil Engineers (ASCE) supports the maintenance, repair and rehabilitation of historic bridges preferably in continued vehicular use, and when that is not possible, some alternative transportation means such as a pedestrian or bike bridge.

Rationale:

Historic bridges are important links to our past, serve as safe and vital transportation routes in the present, and can represent significant resources for the future. Rehabilitation maintains these important engineering structures in service and can represent significant cost savings. Bridges are the single most visible icon of the civil engineer's art. By demonstrating interest in the rehabilitation and reuse of historic bridges, the civil engineering profession acknowledges concern with these resources and an awareness of the historic built environment.

Justification:

Many historic bridges can still serve the nation's transportation needs given appropriate repair, maintenance and flexibility in interpreting transportation standards as suggested by national transportation policy. Due to perceived functional obsolescence, lack of cyclical maintenance, and any funding priority, historic bridges are a heritage at risk. Over half the historic bridges of the United States have been destroyed during the last twenty years - a startling and alarming statistic. Certainly no one can argue that outstanding and representative examples of the nation's historic bridges shouldn't be preserved.

Vehicular use is the best preservation because it keeps the bridge in highway maintenance, inspection and funding programs. When not possible to continue in vehicular use on primary roads, consideration must be given to relocating historic bridges to roads receiving lighter volumes of traffic or alternative means of transportation such as hiking trails and bikeways. America is developing a comprehensive network of scenic highways and byways. Tandem to this is a network of hiking trails and bikeways. Maintaining and relocating historic bridges to these systems sustains the scale, character and feeling of these historic, recreational and scenic corridors.

There is growing public interest in historic bridges. Citizens groups throughout the country are working to save historic bridges. We, as civil engineers, need to help lead and support these efforts. Bridges are engineered resources thus requiring the skills of engineers. There is little chance that the historic bridges of the United States can be saved without the interest and skills of engineers, until they become part of everyday transportation policy, receive the support of transportation officials at all levels, and the continued interests of citizen groups.

**APPENDIX D – MEMORANDUM/LETTER FROM JAMES GARVIN, STATE
ARCHITECTURAL HISTORIAN, NEW HAMPSHIRE**

From: James Garvin [<mailto:jgarvin@nhdhr.state.nh.us>]
Sent: Sunday, November 30, 2003 6:34 PM

To: Dave Powelson

Subject: **Historic Bridge Workshop.**

Thank you for your commitment to attend this important workshop and for being willing to present a New Hampshire perspective there. Eric DeLony (the nation's leading proponent of historic bridge preservation and the founder of the Historic American Engineering Record) will be a leading participant at this conference. As we were discussing the problems of preserving the Shelburne Bridge with Eric this summer, as well as DOT's successes in rehabilitating the Orford-Fairlee Bridge and the Woodsville-Wells River Bridge, it became clear that many of the problems we face in New Hampshire are encountered nationwide. 1. The first problem is lack of a national program for the preservation of historic bridges, with funding. Although we set aside historic bridges under Section 4(f) of the Transportation Act of 1966, we have no follow-up federal assistance in ensuring the permanent preservation of set-aside spans as engineering monuments. Rather, in New Hampshire at least, we let these bypassed bridges languish and deteriorate for fifteen or twenty years, until the public becomes disgruntled at their shabby appearance and worried about their potential for injuring someone, or until they became structurally unsound. Then, when the bridges are perceived locally as a nuisance rather than a historical asset, we take steps that are weighted toward removing these structures rather than preserving them. If the nation's historic bridges are regarded under federal law as parts of our national engineering legacy, we need a federal funding program that will ensure the preservation and interpretation of those bridges that we designate as historic and that we set aside for preservation. Such a federal program need not constitute automatic funding for every set-aside bridge. Rather, like the "Save America's Treasures" program of the National Park Service, federal assistance could take the form of a competitive, matching grants program, requiring state and local initiative to win a federal grant. But right now, there is no open process by which states can seek federal aid in fulfilling a federal preservation mandate. It is true that local entities may seek funding for bridge preservation as Transportation Enhancements under TEA-21 or SAFETEA, but only a minority of local communities are sufficiently aware of their engineering legacy, or sufficiently sophisticated in grantsmanship, to undertake the time-consuming and costly preparation of a Transportation Enhancement grant proposal by themselves. Similarly, all states are urged by federal law to develop a preservation program for their historic bridges. When a state DOT and a state historic preservation office designate a bridge as historic, in partnership with the Federal Highway Administration, the preservation of that bridge becomes a state responsibility as well as a federal mandate. Yet, as I understood Mr. DeLony's remarks, few states have summoned the will to set aside dedicated funding, or to create a bridge preservation trust fund, to assist in the preservation of historic bridges. Rather, once bypassed, such bridges tend to be treated as local problems. And local communities are usually not guided to state and federal sources of technical assistance and funding for the preservation of such spans. In short, we need well-publicized and adequately-funded grants programs for the preservation of our historic bridges. 2. The second problem is inadequate

information on the nation's legacy of historic bridges.

One goal of the December 3-4 workshop is to determine "the number of bridges that realistically can be preserved nationwide." It would be irresponsible to set an arbitrary number of bridges to be preserved nationwide until we have a full inventory of the nation's historic bridges. At present, it is virtually impossible to conduct a nationwide survey of surviving bridge types in order to assess the relative rarity of a given span in a given state. Many states (including New Hampshire) have not updated their historic bridge surveys for almost twenty years. In New Hampshire, we have lost some 50% of some categories of bridges, such as low Warren trusses, since these spans were first inventoried in 1985. As I learned from Eric DeLony last July, many states (including New Hampshire) have not digitized their bridge surveys nor made them available on-line. Thus, there is no available national database of the historic bridges of the United States. Some states, like Maryland, have done exemplary jobs of posting their historic bridge inventories and their state bridge histories on-line. Others have nothing available except on paper. When I was preparing the National Register nomination for the Shelburne Bridge this fall, I needed to discover the number of multiple-span, pin-connected, high Pratt truss bridges in the United States. It was only through painstaking correspondence with various DOTs and SHPOs, and through the kindness of many bridge historians nationwide, that I was able to put the Shelburne Bridge in a national context and demonstrate its national level of significance for the National Register. In short, we need a federal mandate (and federal assistance) for a re-survey of the nation's historic bridges, and we need a mechanism to make the findings of that national survey nationally available. Only with that information can we gauge the magnitude of the problem that this conference will address, and reach consensus on the number of historic bridges than can or should be preserved nationwide--and which bridges, in which states, those should be.

3. A third problem is the lack of enforceable preservation easements on preserved bridges. Each state needs a watchdog agency to receive and monitor preservation easements on bridges in which substantial public funding has been invested. The "Save America's Treasures" program, for example, requires that the recipient of federal funding grant at least a fifty-year preservation easement on the preserved property to an approved preservation organization in the appropriate state. This half-century of oversight will protect the public's investment in that property. Once substantial federal or state funding is invested in the nation's historic bridges, that investment needs similarly to be protected by the granting of long-term or perpetual preservation easements on the preserved spans. As this conference develops its Action Plan, I sincerely hope that this plan will re-focus the FHWA, the state DOTs, and the state SHPOs on a renewed charge to update and assess the nation's legacy of historic bridges and make that assessment available nationwide, on-line. I hope that the conference will remind Congressional participants that information is purely academic in the absence of tools to act upon that information. We need a financial commitment to the preservation of our national engineering legacy, and a well-publicized mechanism by which state and local agencies can compete for the funds to protect that legacy for future generations. We need long-term surveillance over the structures that are preserved through public funding.

Again, many thanks for participating in the Washington conference and for inviting comments from your colleagues in New Hampshire.

Sincerely,

James L. Garvin, PhD, State Architectural Historian, New Hampshire Division of Historical Resources, 19 Pillsbury Street (P. O. Box 2043), Concord, NH 03302-2043 (603) 271-6436 (voice) (603) 271-3433 (Fax)

cc: James Moore; Mark Richardson; Dave Hall NH division FHWA (E-mail); Bill Hauser; Joyce McKay; Dennis Danna; Harry Kinter; Matt Leahy