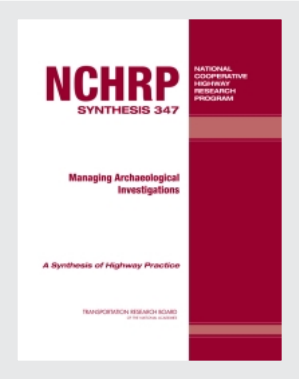

Managing Archaeological Investigations

DETAILS

56 pages | | PAPERBACK
ISBN 978-0-309-09750-5 | DOI 10.17226/13848

AUTHORS

Terry H Klein; Lynne Sebastian; Samantha M Ruscavage-Barz; Stephanie Ford; Joe E Watkins; Transportation Research Board

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP SYNTHESIS 347

Managing Archaeological Investigations

A Synthesis of Highway Practice

CONSULTANTS
TERRY H. KLEIN
LYNNE SEBASTIAN
SAMANTHA M. RUSCAVAGE-BARZ
STEPHANIE FORD
and
JOE E. WATKINS
SRI Foundation
Rio Rancho, New Mexico

SUBJECT AREAS
Planning and Administration and Energy and Environment

Research Sponsored by the American Association of State Highway and Transportation Officials
in Cooperation with the Federal Highway Administration

TRANSPORTATION RESEARCH BOARD

WASHINGTON, D.C.
2005
www.TRB.org

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

In recognition of these needs, the highway administrators of the American Association of State Highway and Transportation Officials initiated in 1962 an objective national highway research program employing modern scientific techniques. This program is supported on a continuing basis by funds from participating member states of the Association and it receives the full cooperation and support of the Federal Highway Administration, United States Department of Transportation.

The Transportation Research Board of the National Academies was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose as it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communications and cooperation with federal, state, and local governmental agencies, universities, and industry; its relationship to the National Research Council is an insurance of objectivity; it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

The program is developed on the basis of research needs identified by chief administrators of the highway and transportation departments and by committees of AASHTO. Each year, specific areas of research needs to be included in the program are proposed to the National Research Council and the Board by the American Association of State Highway and Transportation Officials. Research projects to fulfill these needs are defined by the Board, and qualified research agencies are selected from those that have submitted proposals. Administration and surveillance of research contracts are the responsibilities of the National Research Council and the Transportation Research Board.

The needs for highway research are many, and the National Cooperative Highway Research Program can make significant contributions to the solution of highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement rather than to substitute for or duplicate other highway research programs.

NOTE: The Transportation Research Board of the National Academies, the National Research Council, the Federal Highway Administration, the American Association of State Highway and Transportation Officials, and the individual states participating in the National Cooperative Highway Research Program do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the object of this report.

NCHRP SYNTHESIS 347

Project 20-5 FY 2003 (Topic 35-09)
ISSN 0547-5570
ISBN 0-309-09750-9
Library of Congress Control No. 2005926685

Price $17.00

NOTICE

The project that is the subject of this report was a part of the National Cooperative Highway Research Program conducted by the Transportation Research Board with the approval of the Governing Board of the National Research Council. Such approval reflects the Governing Board's judgment that the program concerned is of national importance and appropriate with respect to both the purposes and resources of the National Research Council.

The members of the technical committee selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and, while they have been accepted as appropriate by the technical committee, they are not necessarily those of the Transportation Research Board, the National Research Council, the American Association of State Highway and Transportation Officials, or the Federal Highway Administration, U.S. Department of Transportation.

Each report is reviewed and accepted for publication by the technical committee according to procedures established and monitored by the Transportation Research Board Executive Committee and the Governing Board of the National Research Council.

Published reports of the

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

are available from:

Transportation Research Board
Business Office
500 Fifth Street, NW
Washington, DC 20001

and can be ordered through the Internet at:

http://www.national-academies.org/trb/bookstore

Printed in the United States of America

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

The **National Academy of Sciences** is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. On the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Ralph J. Cicerone is president of the National Academy of Sciences.

The **National Academy of Engineering** was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. William A. Wulf is president of the National Academy of Engineering.

The **Institute of Medicine** was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, on its own initiative, to identify issues of medical care, research, and education. Dr. Harvey V. Fineberg is president of the Institute of Medicine.

The **National Research Council** was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both the Academies and the Institute of Medicine. Dr. Ralph J. Cicerone and Dr. William A. Wulf are chair and vice chair, respectively, of the National Research Council.

The **Transportation Research Board** is a division of the National Research Council, which serves the National Academy of Sciences and the National Academy of Engineering. The Board's mission is to promote innovation and progress in transportation through research. In an objective and interdisciplinary setting, the Board facilitates the sharing of information on transportation practice and policy by researchers and practitioners; stimulates research and offers research management services that promote technical excellence; provides expert advice on transportation policy and programs; and disseminates research results broadly and encourages their implementation. The Board's varied activities annually engage more than 5,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. **www.TRB.org**

www.national-academies.org

ACKNOWLEDGMENTS

The authors would like to thank Lisa Meyer and David Cushman, also of the SRI Foundation, for assistance in the synthesis research.

FOREWORD

By Staff
Transportation
Research Board

Highway administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to highway administrators and engineers. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire highway community, the American Association of State Highway and Transportation Officials—through the mechanism of the National Cooperative Highway Research Program—authorized the Transportation Research Board to undertake a continuing study. This study, NCHRP Project 20-5, "Synthesis of Information Related to Highway Problems," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an NCHRP report series, *Synthesis of Highway Practice.*

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

PREFACE

This synthesis report focuses on practices that improve archaeological investigations by both streamlining the overall transportation project delivery process and enhancing the stewardship of archaeological resources. The report examines practices that improve and maintain good communication and coordination at all stages of transportation programs, including that between agencies and Native Americans and efforts at public outreach. It also reviews internal state department of transportation (DOT) business practices, and examines effective and innovative practices for complying with Section 106 of the National Historic Preservation Act, the National Environmental Policy Act, and project design. The synthesis also examines pre-project planning efforts, including programmatic agreements, treatment guidance and specifications on specific archaeological resources, creative mitigation, and effective collection methods. In addition, problems and successes encountered when attempting to apply innovative approaches are discussed.

Information on effective practices was obtained through a literature search, including historic preservation, environmental streamlining, and state historic preservation office (SHPO) websites and surveys of state DOT archaeologists, FHWA state division offices, SHPOs, Native American tribes, and private-sector cultural resource management consultants working for DOTs.

A panel of experts in the subject area guided the work of organizing and evaluating the collected data and reviewed the final synthesis report. A consultant was engaged to collect and synthesize the information and to write the report. Both the consultant and the members of the oversight panel are acknowledged on the title page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

CONTENTS

MANAGING ARCHAEOLOGICAL INVESTIGATIONS

SUMMARY

This NCHRP synthesis report focuses on practices that improve the cost, timeliness, and public benefit of archaeological investigations, in addition to those that streamline the overall transportation project delivery process and enhance the stewardship of archaeological resources. Information on these effective practices was obtained through a literature search and a survey of a variety of agencies and organizations. The survey involved state departments of transportation (DOTs), FHWA state division offices, state historic preservation offices (SHPOs), Native American tribes, and cultural resource management firms. Thirty-four state DOTs, five FHWA offices, seven SHPOs, six tribes, and five cultural resource management firms responded to the survey.

The literature review and survey identified a wide range of effective practices associated with the management of archaeological investigations. These practices fall into the following categories:

- Communication
- Internal Business Practices
- Project Delivery: Integrating Section 106, National Environmental Policy Act (NEPA), and Design
- Pre-Project Planning
- Innovative Approaches to Section 106 Steps

Effective practices to improve and maintain good communication among agencies include having regular meetings that review ongoing and future projects; participating in collaborative efforts; and establishing joint objectives, goals, and processes. Discussions and consultations held outside of the requirements of individual projects are an especially effective means of building trust and communication. This is certainly the case with tribal consultation, where general discussions on protocols and important issues are best held without the constraints and potential conflicts inherent in specific transportation projects. Good and continuous communication is critical, as poor communication results in conflict, mistrust, project delays, and increased project costs.

Internal business practices include the size and make-up of DOT staff, the structure of cultural resource management consultant contracting, and the location of decision-making authority. Some DOTs note, for example, that having on-call or master contracts with consultants results in rapid initiation of projects with minimal administrative paperwork. A few DOTs use universities or other sister state agencies to conduct archaeological investigations. The benefits of this approach include increased flexibility, decreased administrative and contractual burdens, and consistency in work. Several states also believed that using in-house staff resulted in more consistent work products and streamlined communication between archaeologists, project engineers, and planners.

Another important aspect of internal practices is the way in which archaeological investigations (and compliance with Section 106 of the National Historic Preservation Act) are integrated into project design and the NEPA decision-making process. If archaeological investigations are not appropriately integrated into the NEPA process and project design, delays and conflicts result. Several state DOTs and FHWA state division offices avoid these

problems, for example, by phasing archaeological investigations. Some states perform a sample survey of each project alternative (studied in detail in the NEPA process) to evaluate the potential of each to contain significant archaeological resources. Full identification surveys do not occur until the preferred alternative is selected.

Pre-project planning efforts establish frameworks and procedures that guide future project development and associated Section 106 reviews. These efforts include, but are not limited to, programmatic agreements, information technology/information management tools, and syntheses and treatment guidance for categories of archaeological resources. Programmatic agreements, in particular, reduce project costs and review time, allow greater flexibility in Section 106 compliance, focus Section 106 compliance on substantive issues and site types, and result in predictable project and preservation outcomes. These agreements are especially valuable for effectively integrating Section 106 compliance with the NEPA process. Information technology provides cost-effective ways to evaluate alternatives for transportation projects and to target survey and testing dollars on the areas where they will yield the most valuable information. Syntheses and treatment guidance provide frameworks for evaluating archaeological site significance and can predefine mitigation strategies for sites affected by transportation projects.

In addition to employing innovative approaches to pre-project planning, several DOTs apply project-specific practices that enhance and streamline archaeological investigations and the steps in the Section 106 process. These practices include the use of geophysical technology and creative mitigation. Geophysical techniques, which include the use of aerial photography, satellite imagery, and ground penetrating radar, are cost-effective ways of improving archaeological resource identification and evaluation efforts, and because they are nondestructive, they are appropriate for properties about which tribes have cultural or religious concerns.

A number of the states surveyed have turned the challenge of dealing with sites with limited information potential and sites that have no evaluative context (i.e., historic contexts) into opportunities for creative mitigation measures. By dealing expeditiously (or not at all) with these sites and then retaining and redirecting the funds that would have been spent on these sites, a number of DOTs have been able to fund historic contexts and other studies that are needed for better evaluation and management of sites that will be affected by future transportation projects.

One of the goals of this NCHRP study is to examine how agencies quantify the benefits of effective innovative practices. The questionnaires for DOTs and FHWA asked if they had quantified the benefits of implementing these practices and, if so, what measures they used—cost, timeliness of project delivery, number of sites avoided, or other factors. Unfortunately, very few states collect this type of information. Those that had such information described their ability to reduce costs as a result of implementing various innovative practices. These states continuously work to find better and more efficient ways of doing historic preservation compliance work; using such tools as programmatic agreements, smarter artifact collection strategies, and archaeological surveys that are postponed until they are genuinely needed during the NEPA and project design process.

Another goal of this study is to identify future research needs associated with improving the management of archaeological investigations. The questionnaires asked survey respondents to list the types of tools and research they would like to see in the future. Identified needs included historic context development; protocols for geophysical investigations; creation of a web-based repository or clearinghouse for archaeological information, data, and documentation; and a nationwide study on the use of site burial as a form of mitigation.

Additional specific research needs include synthesizing and evaluating previous archaeological investigations to better define significant archaeological resources and identify the

most effective methods to manage such resources; evaluating the public benefits of archaeological investigations; determining whether centralized or decentralized state DOT programs impact the effectiveness of archaeological investigations; evaluating the effectiveness of agency-generated manuals, guidance, and training; and quantifying the benefits of innovative, effective practices.

CHAPTER ONE

INTRODUCTION

BACKGROUND

In 1998, the U.S. Congress mandated, though passage of the Transportation Equity Act for the 21st Century (TEA-21), the streamlining of the environmental review process for transportation projects. This was followed in 2002 by a White House Executive Order (E.O. 13274, September 18, 2002) that emphasized "the importance of expedited transportation project delivery while being good stewards of the environment" (*1*). Environmental streamlining calls for improved environmental and regulatory review of federally linked projects. It involves the reduction and elimination of delays and unnecessary duplication in environmental procedures. Streamlining also calls for earlier and more efficient coordination among agencies involved in the environmental decision-making process to reduce conflicts and delays. Environmental "stewardship" directs transportation agencies to improve project delivery without compromising environmental protection. Stewardship improves the environmental quality of transportation decision making and also involves taking advantage of opportunities to enhance environmental protection (*2*).

One of the many environmental reviews performed as part of transportation project delivery is compliance with national historic preservation laws and regulations; in particular, Section 106 of the National Historic Preservation Act (NHPA). In a review of past historic preservation and transportation streamlining and stewardship efforts, Klein and Naber (*3*) identified several issues that are repeatedly raised during national transportation and historic preservation forums, meetings, and conferences. These include the need for

- Better access to, analysis of, and use of cultural resource data for making sound transportation decisions;
- Early and more efficient coordination among all parties involved in all stages and components of transportation programs;
- Early and more efficient coordination and integration of overlapping and at times conflicting regulatory and compliance procedures [i.e., Section 106 and the National Environmental Policy Act (NEPA)];
- Contextual information for evaluating resource significance, determining what the "context" is in context-sensitive solutions, and defining and meeting local and regional historic preservation goals, plans, purpose, and need;
- Constructive public input in the creation and use of this contextual information (tribal and minority communities in particular need to be partners in this effort);
- Clear principles and procedures for the role of Native American tribes in the Section 106 process; and
- Direct and tangible public benefit from historic preservation actions.

Several state departments of transportation (DOTs), state FHWA division offices, state historic preservation offices (SHPOs), and tribes have begun to address these needs in the context of archaeological investigations (*4*). To document how and to what extent agencies and tribes have dealt with these issues and needs, NCHRP funded a synthesis study that would pull together, in a single document, information on effective streamlining and stewardship practices involving archaeological investigations.

This synthesis was also designed to explore how agencies and tribes address the often problematic nature of archaeological work performed as part of FHWA's compliance with Section 106 of the NHPA. Section 106 of the act requires that federal agencies take into account the effects of their projects on properties listed in or eligible for listing in the National Register of Historic Places (NRHP), and provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the proposed project (Section 106 will be described in more detail later in this chapter). In a 2001 article in *CRM*, a magazine of the National Park Service, Barbara Little noted that

> During the mid-1990s, critics both within and outside the profession [of archaeology] raised questions about how public archaeological programs were carried out in the United States. Critics asserted that implementation of laws, regulations, guidelines, and standards were inconsistent; that laws and regulations were applied inappropriately; that costs of conducting archaeological investigations were too high and frequently provided little return on expenditures; and that decisions frequently were made to expedite administrative procedures rather than for appropriate treatment of significant archaeological properties (*5*, p. 21).

In 2000, ACHP staff archaeologists compiled a list of issues raised in public comments on proposed changes to the agency's 36 CFR Part 800 regulations; the regulations that implement Section 106 of NHPA (T. McCulloch, personal communication, 2004). The issues most directly related to archaeology were similar to those discussed by

Little (*5*), and also included the following observations and questions:

- How much identification is enough? According to whom?
- There is too much duplicative and redundant work, and poor use of existing data.
- There is not enough discrimination as to which archaeological resources are significant or valuable, or on what basis.
- Section 106 procedures inappropriately relegate archaeological resources to second class status.
- There should be a clear focus on creative, desirable outcomes for protection and enhancement of archaeological resources, and their related public benefit, rather than just process.
- The inappropriate "public subsidy" of archaeological research, especially costly excavation, is too routinized.

This synthesis report focuses on effective practices that address these and related issues by improving the cost-effectiveness, timeliness, management, and public benefit of archaeological investigations. These practices also streamline the overall project delivery process and enhance the stewardship of archaeological resources. Effective practices associated with the Section 106 process are generally conducted in the context of project-specific undertakings, often under the umbrella of the development of the NEPA process. State DOTs and other agencies, however, are also using approaches whereby information on and procedures for archaeological resource identification, evaluation, and treatment are established before project initiation. Many of these effective practices are new and innovative, moving beyond standard operating procedures. "Innovative" approaches are defined here as those that differ from or build and expand on standard methods found in existing federal and state guidelines for archaeology. These guidelines include the more than 20-year-old ACHP *Treatment of Archaeological Properties: A Handbook* (*6*), the 1983 *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (*7*), and the more recent 2000 *National Register Bulletin: Guidelines for Evaluating and Registering Archeological Properties* (*8*), in addition to the many individual standards and guidelines developed by SHPOs and some state DOTs.

These guidance documents and standards attempt to provide needed consistency and predictability in archaeological investigations conducted as part of compliance with Section 106. Over the years, however, state and federal procedures based on these standards and guidelines have become bureaucratic and inflexible and are out of sync with the changes that have occurred within archaeology and historic preservation (*5*,*9*–*13*). This is not the fault of the standards and guidelines per se, but is a result of the way in which historic preservation and transportation professionals have interpreted and applied them.

As a starting point in the development of this synthesis report, the potential range of effective practices to be documented through this study was identified. The following list of practices is based on the experiences of the topic panel members, the consultants, and various national studies that examined current historic preservation and transportation projects and programs (*3,4*).

- Programmatic approaches to Section 106 compliance.
- Creative mitigation (e.g., "off-site mitigation," which includes analysis of existing collections, development of local or regional archaeological or historical syntheses, preparation of nontechnical reports in lieu of or supplemental to site data recovery reports, etc.).
- Integration of tribal consultation into archaeological investigations.
- Integration of public outreach and education into archaeological investigations.
- Remote sensing.
- Use of geoarchaeological data as a planning and NRHP evaluation tool.
- Effective collection methods.
- Effective approaches to the growing curation problem.
- Flexible data recovery research designs.
- Use of sampling during site identification, evaluation, and data recovery.
- More effective use of information technology (IT) [e.g., Geographic Information Systems (GIS) and predictive modeling].
- Flexibility in contracting practices (e.g., cost-plus versus fixed-fee contracts and use of in-house staff as opposed to outsourcing).

The list also includes other practices that have an impact on the efficacy of archaeological resource management, including

- Building good relationships and trust among state DOTs and resource agencies, such as SHPOs.
- Integrating the Section 106 process with the steps in the NEPA process.
- Integrating the Section 106 process with the steps in the project design process.
- Funding of state DOT project review positions within SHPOs.
- Training to improve the skills of both agency and consultant staffs.

Information on effective practices was obtained through a literature search and a survey of state DOT archaeologists, FHWA state division office staff, SHPOs, Native American tribes, and private-sector cultural resource management (CRM) consultants working for DOTs. The aforementioned items were included in a survey questionnaire distributed to the agencies, tribes, and CRM firms. The questionnaire asked whether or not the agencies, tribes, and firms had experience implementing one or more of the listed practices. They were

also asked to describe the successes or problems encountered in implementing these practices. The listed items also served as the framework for the literature review.

As noted previously, this synthesis report documents effective practices as they relate to compliance with Section 106. For those readers who are not familiar with the Section 106 process, the following section briefly reviews the steps of the process. The ACHP's website provides a more detailed discussion on the steps in the Section 106 process (*14*). As many of the effective practices reviewed in this report are linked to the NEPA process, a brief description of this process is also provided. For a more detailed review of NEPA in the context of FHWA policy, see FHWA's NEPA Project Development website (*15*).

Section 106

Section 1 of the National Historic Preservation Act of 1966, as amended, states that "the spirit and direction of the Nation are founded upon and reflected in our historic heritage," and that this heritage should be preserved as part of our community life and development. The act goes on to state that the preservation of this irreplaceable heritage is in the public interest and there must be mechanisms in place to preserve this heritage in the face of development and growth, particularly when they are linked to federal actions. This balancing of what often appears to be opposing needs is the primary objective of NHPA and the regulations that implement Section 106 of the act (i.e., 36 CFR Part 800).

> It shall be the policy of the Federal Government . . . to . . . use measures, including financial and technical assistance, to foster conditions under which our modern society and our prehistoric and historic resources can exist in productive harmony. . . . (National Historic Preservation Act, Section 2).

> The Section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency officials and other parties with an interest in the effects of the undertaking on historic properties. . . . [36 CFR 800.1(a)].

Section 106 requires federal agencies to take into account the effects of their actions on historic properties. These actions include funding, permitting, and authorizing projects and programs, both on and off federal lands. "Historic properties" are sites, buildings, districts, structures, or objects listed in or eligible for listing in NRHP. The National Register is used as the standard for defining the significance of historic places, including archaeological sites. This section of the act also requires that ACHP be given an opportunity to comment on the federal agency's action in terms of its effects on historic properties. ACHP is an independent federal agency that advises the President and Congress on historic preservation matters, encourages the preservation of historic properties through review of federal agency programs and projects, and promotes the preservation of historic properties by providing training, developing guidance, and assisting the public.

The other participants in the Section 106 process include what are referred to as "consulting parties." These include SHPOs, who serve as the state's representative in the process, and tribal historic preservation officers (THPOs), who serve the same function as the SHPO, but on tribal lands. When an undertaking is on tribal lands, the federal agency consults with the THPO, and if a tribe has no THPO, the agency consults with a designated tribal representative and the appropriate SHPO. For undertakings off tribal lands, the agency consults with all federally recognized tribes that attach religious and cultural significance to properties that may be affected by the undertaking. The agency does this by consulting with the appropriate THPO, designated tribal representative (for tribes with no THPO), and the appropriate SHPO.

Additional consulting parties include, but are not limited to, local governments; nonfederal applicants for federal funds, permits, or licenses; and individuals and organizations with a demonstrated legal or economic interest or concern about historic properties that may be affected by the undertaking. The agency also has an obligation to inform and involve the public. State DOTs are generally involved in the Section 106 process as applicants for federal funds, permits, or approvals.

The regulations at 36 CFR Part 800 establish the process through which federal agencies can meet their responsibilities under Section 106. This process consists of four steps. In Step 1, the agency initiates the Section 106 process by first determining if its action is an undertaking that falls under the purview of Section 106, and whether or not the action has the potential to affect historic properties. If the action is an undertaking that has the potential to affect historic properties, then the agency initiates consultation with the appropriate SHPO, THPO (if appropriate), and other consulting parties.

The second step involves the identification of historic properties within a project's area of potential effects. This is the area within which a project may directly or indirectly cause changes in the character or use of historic properties, if such properties exist. Because many properties have not been identified and evaluated for National Register listing, agencies must make a reasonable and good faith effort to identify such properties within the area of potential effects and then evaluate their eligibility for listing. When an unevaluated property is found, the agency evaluates the property using the four National Register criteria:

1. Criterion A is associated with events that have made a significant contribution to broad patterns of history.
2. Criterion B is associated with the lives of persons significant in the past.

3. Criterion C embodies the distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic values; or represents a significant and distinguishable entity whose components lack individual distinction.
4. Criterion D has yielded or may likely yield information important in prehistory or history.

When the SHPO (or THPO if the property is on tribal lands) concurs with the agency's evaluation, the property is treated, for the purposes of Section 106, as eligible for listing in NRHP.

If no historic properties are found in the area of potential effects, or if properties are found but the project will not affect the properties, the agency makes a finding of "no historic properties affected." This finding is made in consultation with the Section 106 consulting parties. A finding of "no historic properties affected" completes the Section 106 process.

If there are historic properties within the area of potential effects and the agency determines that its project may affect one or more of these properties, the federal agency evaluates the nature of these effects. This is step three in the Section 106 process, and as with all steps in the process, is done in consultation with the consulting parties, particularly the SHPO (or THPO if the undertaking is on tribal lands). The agency determines if its project will diminish those qualities that make the properties eligible for listing in the National Register. If the project will diminish these qualities, the agency makes a finding of "adverse effect"; if not, the agency makes a finding of "no adverse effect." A finding of no adverse effect completes the Section 106 process.

In step four, the agency works with the Section 106 parties to resolve any adverse effects on historic properties. Resolution of adverse effects may involve redesigning a project to avoid or minimize impacts to properties. If avoidance is not possible, then the agency will implement actions to mitigate these effects. For archaeological sites, this is usually accomplished through site excavation. These excavations are referred to as archaeological data recovery, as the important data contained within the site is recovered before the site is affected. Actions to resolve adverse effects are codified in a Memorandum of Agreement (MOA), which is a legally binding agreement among the federal agency, SHPOs and/or THPOs, ACHP, and the consulting parties invited to sign the document. Once the agreement is signed by all appropriate parties, the Section 106 process is completed. The agency's Section 106 responsibilities are fulfilled when the MOA's stipulations are implemented.

NEPA

The National Environmental Policy Act of 1969 requires federal agencies to balance development and environmental protection. To comply with the act, agency decision makers must be fully informed about the environmental consequences of their decisions to approve, finance, permit, or license a project. They must also solicit input from and inform the public about the proposed project, the environmental consequences of the proposed action, and the ultimate agency decision about how the project will proceed.

The results of the NEPA decision-making process are disclosed through an environmental document.

> [D]ocumenting the NEPA process provides for complete disclosure to the public; allows others an opportunity to provide input and comment on proposals, alternatives, and environmental impacts; and provides the appropriate information for the decision maker to make a reasoned choice among alternatives (*15*).

The federal Council for Environmental Quality oversees the national NEPA program and promulgated the regulations implementing the act (i.e., 40 CFR Part 1500). Each federal agency also has its own set of regulations stipulating how the agency is to comply with its NEPA responsibilities, within the context of that agency's mission. FHWA's policies and procedures for implementing NEPA and Council for Environmental Quality regulations are found in 23 CFR Part 771. FHWA manages the NEPA project development and decision-making process "as an 'umbrella,' under which all applicable environmental laws, executive orders, and regulations are considered and addressed prior to the final project decision and document approval" (*15*).

The FHWA's compliance with Section 106 of the NHPA is generally accomplished under the NEPA umbrella. This is done by integrating the steps in the Section 106 process with the steps associated with the NEPA process.

Federal actions range from small to very large, complex projects, each resulting in different types of environmental impacts. To account for this range of impacts, NEPA defines three classes of actions and documentation levels:

1. An Environmental Impact Statement (EIS) is prepared when an action is likely to cause significant impacts to the environment.
2. Categorical Exclusions (CEs) are issued for actions that do not individually or cumulatively have a significant effect on the environment (*15*).
3. An Environmental Assessment (EA) is prepared for actions in which the significance of the environmental impact is not clearly established. Should environmental analysis and interagency review during the EA process find a project to have no significant impacts on the quality of the environment, a Finding of No Significant Impact (FONSI) is issued.

CEs are generally used for actions that, based on the agency's experience, will have little or no environmental impact. FHWA's NEPA regulations provide a list of such

actions. At times, the preparation of an EA results in a finding that the proposed action will have a significant impact on the environment. In these cases, the federal agency will file a public Notice of Intent to prepare an EIS and will proceed with the development of the EIS.

SYNTHESIS RESEARCH METHODS

Information on effective practices discussed in this report was obtained through a literature search and a survey of a variety of agencies, organizations, and tribes. Sources consulted during the literature search included the FHWA's historic preservation website, FHWA's environmental streamlining websites, and the websites of individual state DOTs and SHPOs. Other sources included TRB reports and documents.

The literature search was followed by a survey of state DOT archaeologists and FHWA state division office staff, tribal representatives, SHPOs, and CRM firms. The survey was conducted from April 2004 to September 2004. The questionnaires used in this survey can be found in Appendix A. Some respondents preferred to be interviewed, rather than complete and submit the questionnaire. Interviews were conducted by telephone, and at times involved multiple members of an agency's staff. The survey questionnaire provided the structure for these interviews. An important part of the survey was obtaining information on the benefits of practices in terms of time, cost, and enhanced archaeological resource conservation. Every attempt was made, therefore, to obtain quantitative information on time and cost savings resulting from the use of these practices.

DOT participation was solicited through the Association of Transportation Archaeologists e-mail group of all state DOT archaeological staff, maintained by Kevin Cunningham of the Delaware DOT. This was followed-up by direct e-mail requests to the heads of all DOT environmental divisions. FHWA staff was contacted directly, using a list of division offices recommended by FHWA headquarters. A total of 34 state DOTs and 5 FHWA offices responded to requests to participate in this study.

Separate questionnaires were developed for SHPOs and consultants (see Appendix A). An inquiry was sent out to SHPOs through the National Conference of State Historic Preservation Officers (NCSHPO) listserve. The posting on the listserve was followed-up with direct e-mails to deputy SHPOs of each office or the individual overseeing Section 106 compliance. Seven SHPOs responded. The low SHPO response can be attributed to recent reductions in SHPO funds and staff. SHPOs do not have time to respond to the multiple surveys that are continually sent to their offices given reduction in staff and, in some cases, increased workload within these offices (N. Schamu, National Conference of SHPOs, personal communication, 2004).

The CRM consultant community was contacted through the American Cultural Resource Association's (ACRA) "MembersOnly" listserve. Consultants who are not ACRA members but were recommended by the NCHRP Topic Panel and DOTs and FHWA offices participating in this study were also contacted. Five CRM firms responded.

Twelve Native American tribes were also contacted to participate in this study. This list of tribes was created based on recommendations from state DOT and FHWA division office staff, and the SRI Foundation's tribal consultant, Dr. Joe Watkins. Dr. Watkins is a member of the Choctaw Nation and, at the time of this report, an Associate Professor of Anthropology at the University of New Mexico. Six of the 12 tribes responded to the survey. The interviews of tribal representatives involved only one question: Can you describe for us a DOT project, in which you were directly involved, where the archaeological investigations went really well from a tribal point of view, and resulted in a new, innovative way of dealing with tribal issues associated with archaeological sites?

Results from the interviews and survey questionnaires were compiled. Transcriptions of the interviews were sent to the respondents for review and comment. In addition, each survey respondent and individual interviewed was given an opportunity to review the report sections that were based on their responses.

The work plan for this study included a preliminary synthesis report outline. This outline focused on the four steps of the Section 106 process. It was anticipated that the survey responses would focus on effective practices to streamline and enhance the four steps. However, this was not the case. Rather, the survey respondents focused on the following four topics, which in general are used uniformly across the country:

1. Communication (including tribal consultation and engaging the public),
2. Internal business practices and project delivery,
3. Pre-project planning, and
4. Innovative approaches to Section 106 steps.

Interestingly, a similar change in focus occurred during a February 2004 historic preservation and transportation conference held in Santa Fe, New Mexico. The primary objective of this conference was to develop effective strategies that enhance and streamline Section 106 compliance and transportation project delivery.

The focus of the conference, identified in consultation with the conference sponsors, was originally an exploration of how to improve the integration of the four steps in the Section 106 process and the transportation project delivery process. The conference products were to include recommendations on how to improve this integration. As discussions proceeded, the conference's focus shifted from the specifics of the Section 106 process to the following topics,

which subsequently served as the foundation for the conference's recommended action plans:

- Pre-project planning—integrating cultural and natural resources early in pre-project planning and programming, re-energizing the development and appropriate use of historic contexts, and examining pre-project planning models.
- Improving the Section 106 process and project delivery—improving mitigation efforts, creating consistent approaches for assessing National Register eligibility and project effects, and developing state-based streamlining agreements.
- Communication—enhancing public benefits, developing guidance on tribal consultation, and emphasizing context-sensitive design in terms of historic preservation.
- Funding—fully funding the Historic Preservation Fund, setting aside FHWA grant program funds for historic preservation offices (HPOs), and presenting examples and evidence on the value of pre-planning to agency leaders.
- IT/information management systems—creating a model DOT information clearinghouse website, designing a model project activity tracking program, and fostering and improving tribal IT.

A preliminary draft of the conference recommendations and the action plans are presented in Appendix C.

ORGANIZATION OF REPORT

As demonstrated by the synthesis survey responses and the 2004 Santa Fe conference, communication (both internal and external to state DOTs) is critical to the success and effectiveness of archaeological investigations (*15*). Chapter two, therefore, examines practices that improve and maintain good communication, including communication between agencies and Native American tribes and efforts to engage the public. Another factor that influences the effectiveness of archaeological investigations (and Section 106 compliance) is the nature of internal state DOT business practices, which include the structure and function of archaeological divisions within a DOT. Chapter three reviews internal business practices within state DOTs. This chapter also examines effective and innovative practices to integrating Section 106, NEPA, and project design, particularly in terms of the timing and level of effort for archaeological investigations during the project development process. Chapter four focuses on nonproject-specific efforts that streamline future project delivery and review. These pre-project planning efforts include programmatic agreements (PAs), IT/information management tools (such as GIS databases and computerized archaeological predictive models), and syntheses and treatment guidance on specific categories of archaeological resources. Chapter five examines practices that improve the basic steps in the Section 106 process. These practices include the use of geophysical methods as a tool for archaeological resource identification and NRHP evaluation, flexible and staged data recovery strategies, and creative approaches to resolving adverse effects on archaeological sites. As part of the survey, each person was asked to describe the obstacles they encountered when they tried to implement an innovative approach. These obstacles are reviewed in chapter six. The results of this synthesis study are summarized in chapter seven, focusing on areas of future research and needs identified by the state DOTs, FHWA, SHPOs, tribal representatives, and private-sector firms.

CHAPTER TWO

COMMUNICATION

FHWA's May 2004 *Success in Streamlining* newsletter notes that

> Common to many of these streamlining methods is the need for interagency cooperation. When agencies have strong working relationships based on mutual trust and open communication, they are better able to effectively negotiate differences, make compromises, and reach agreements. However, when one party is hesitant to trust the other, working relationships break down (*16*).

Communication is clearly one of the most important factors in environmental streamlining and stewardship efforts, especially those associated with the Section 106 process. The core of Section 106 is a consultative process that balances historic preservation concerns with project delivery needs. This consultation process, which involves structured and continual interaction among state DOTs, FHWA, SHPOs, tribes, and the general public, requires good communication among the parties to be successful.

Given the importance of communication, this synthesis report begins with a discussion of effective practices that promote and maintain good communication among the Section 106 parties involved in managing archaeological investigations. The discussion first examines relationships among state DOTs, SHPOs, and FHWA, then reviews effective practices associated with tribal consultation and public outreach.

RELATIONSHIPS AMONG AGENCIES

> The key is just communication and constant communication. Make sure everyone stays in communication (from interview with Paul Graham, Ohio DOT, 2004).

Of the 34 DOTs responding to the survey questionnaire, the majority reported that their relationships with their respective SHPOs were good. Two of the DOTs stated that their relationship was poor, whereas two noted that it was mixed. The negative and mixed state DOT responses provide a view of what to avoid when working toward effective approaches to communication. The primary conflict between these agencies is differing interpretations of the letter and intent of Section 106 and 36 CFR Part 800. The view of some DOTs is that the SHPO's goal is to conduct archaeological research on everything, in addition to asking for levels of effort that the state DOTs find unreasonable and unnecessary. For example, one DOT noted that the main point of conflict involves decisions about what constitutes adequate archaeological testing, particularly when dealing with sites that appear to have very limited research value. Another DOT complained that SHPO staff micromanage every DOT archaeological project, straining the two agencies' relationship.

Most DOTs have a good relationship with their respective FHWA state division offices. Two DOTs noted that their relationship with FHWA was strained; however, both agencies have good relations with their SHPOs. Another DOT characterized its relationship as good, but not of the same caliber as its relationship with the SHPO. A fourth DOT stated that their division office was a "non-player" in terms of cultural resource decision making. Most saw the division offices as supportive and also a source for guidance on national streamlining and stewardship initiatives. The two reports of strained relationships identified the cause as new out-of-state staff working in the FHWA division office. The new staff did not understand local situations and existing working arrangements with the SHPO. New staff also assumed that every project would be problematic. As a result, FHWA required investigations that were too extensive or believed to be unnecessary by the DOTs, simply as a way to avoid all possible problems in the future, even though such problems had not occurred on past projects. One DOT noted that a point of conflict with FHWA was a lack of consistency in FHWA's requirements.

Five of the seven responding SHPOs reported that they have good relationships with their respective DOTs. One SHPO noted that although the relationship with the DOT was good it could be improved with more regularly scheduled meetings. This would require, however, that both the SHPO and DOT make such meetings a higher priority. Another SHPO stated that its relationship with the DOT was improving as a result of two new DOT-funded positions within the SHPO. SHPO staff now had the time and ability to meet regularly with the DOT, FHWA, and its consultants to discuss program and project issues. One SHPO characterized its relationship with the DOT as not particularly good, owing to mutual mistrust and ongoing "turf wars" between the agencies. This SHPO has the same problem with its state FHWA division office.

The relationship between SHPOs and their respective FHWA division offices is more variable, depending on whether the SHPO routinely interacts with FHWA. Three of the SHPO respondents do not have regular interaction with FHWA division offices. One SHPO participates in monthly meetings with FHWA and DOT. These meetings help maintain a strong working relationship between the agencies. Two SHPOs report good relationships between the agencies, and one SHPO has a poor relationship, owing to mistrust between the agencies (as discussed earlier). The Kentucky FHWA division office noted that as a result of decreasing agency budgets and their concerns about the cost and scope of archaeological investigations, its' relationship with the SHPO had become strained. As a means to resolve conflict between the agencies, the division office will be meeting with the SHPO and state DOT to discuss a range of alternative approaches for archaeological studies. They will also review how other states are dealing with these issues.

Based on the survey questionnaire responses, effective practices to counter or prevent poor interagency relations include

- Having regular meetings that review ongoing and future projects;
- Participating in collaborative efforts, such as joint training;
- Establishing joint objectives, goals, and processes; and
- Having upper management support and directives to improve and maintain good relations.

Such practices are also highlighted in an on-line "how-to" tool kit for developing programmatic agreements. The tool kit is posted on the AASHTO Center for Environmental Excellence website (*17*). The tool kit also provides some additional practices for building trust and improving communication, such as

- Avoiding obvious trust killers,
- Expressing appreciation,
- Being professional,
- Investing in your staff's knowledge, and
- Investing time and effort in building relationships.

Three of the DOTs responding to the survey noted that they have regular meetings with their respective SHPOs to discuss projects and programs, particularly those that may be controversial. Five other DOTs reported that they have frequent discussions with the SHPO through telephone calls, e-mail, and periodic meetings. These discussions address levels of effort for surveys and National Register evaluations, the results of these evaluations, and approaches to resolving adverse effects on significant archaeological sites. When conflicts do occur, these meetings are used as the means to address any problems and, if necessary, these issues can be elevated to upper management. Several of the DOTs noted that although they do not always agree with the SHPO's views, these disagreements are understood to be professional disagreements, not personal.

New South Associates, Inc., a Georgia CRM firm, noted that collaborative efforts among DOTs and SHPOs often resulted in improved working relationships among the DOT, SHPO, and consultants hired to assist in these efforts. The development of historic contexts for archaeological resources was described as one such collaborative effort.

The attitude of a DOT is also important. The Texas DOT (TxDOT) noted that its agency is enthusiastic about compliance with the law and regulations, and that they are not the enemy. The agency is also being more proactive in doing their job, thus earning the respect of the SHPO by "doing the right thing." The need for improved relationships was forced on both agencies by a large increase in the number of projects. The two agencies had to communicate more effectively to deal with the increasing work load.

The Iowa DOT formally codified their responsibilities and those of the SHPO as collaborators in Section 106 compliance. The Iowa DOT, FHWA, and SHPO held a partnering workshop in 1997, and all of the participants signed a charter to form a Cultural Interchange Team (CIT) that worked to resolve process issues among the agencies. If the CIT cannot immediately resolve a process issue that is brought to the team, the issue is taken to the CIT members' supervisors for suggestions and/or instructions. These suggestions or instructions are brought back to the CIT during its next meeting. If there is still no agreement, then the CIT members take the issue to their agency's upper management for resolution. The Iowa DOT noted that "as the partnership progressed and the number of issues declined, meeting frequency was decreased from the initial monthly to bi-monthly, and recently to quarterly." In addition, the agency stated that issues are rarely elevated beyond the team.

TRIBAL CONSULTATION AND ARCHAEOLOGICAL INVESTIGATIONS

Tribal consultation is an evolving field with special legal issues (e.g., government-to-government relationships, tribal sovereignty, and federal agency trust responsibilities), and successful consultation requires an awareness of the different world views and cultural traditions of the parties involved. As is evident from the survey responses, and from a recently posted AASHTO website on tribal consultation (*18*), many state DOTs have taken to heart the need to improve their tribal consultation efforts, particularly with regard to archaeological investigations. The Oregon DOT has quarterly meetings with three of the state's tribes, and annual meetings with others, to review project schedules and provide a regular forum for discussing upcoming projects. These regular meetings are in addition to case-by-case project consultations. The Wisconsin DOT has a Native Ameri-

can liaison committee consisting of 11 state tribes and 4 DOT representatives. The committee, which meets two to three times a year, discusses concerns of both the DOTs and the tribes. One important issue that was resolved by this liaison committee was the development of a protocol for the treatment of burials encountered during archaeological studies. The committee also provided an opportunity to build trust with the tribes through face-to-face communication.

To streamline the consultation process, some FHWA division offices (e.g., Colorado, Oklahoma, Pennsylvania, Washington State, and Wyoming) have assigned certain tribal consultation activities to the state DOT. This delegation of activities is always done in close consultation with the tribes, and FHWA ultimately remains responsible for government-to-government consultation efforts. This delegation to the state DOTs has resulted in improved and continuous communication with the tribes, because state DOT staff is usually larger than FHWA's, and DOTs have the expertise in both tribal consultation and archaeological investigations. The FHWA state division offices often do not have this expertise in-house.

The primary effective practices associated with tribal consultation, highlighted in the literature review and survey, include

- PAs,
- Memoranda of understanding (MOUs),
- Pre-project consultation, and
- Tribal summits and conferences.

TxDOT has PAs with 12 tribes, 10 located outside the state and 2 in-state. The PAs stipulate when the DOT is to consult with a tribe and which types of projects require consultation. For example, under the PA with the Tonkawa Tribe (*4*), the DOT directly coordinates with the tribe on behalf of FHWA, with FHWA approving all outcomes. The agency contacts the tribe only when a site with Native American artifacts has been found in an area of concern to the tribe. The PA also clarifies for the tribe TxDOT's consultation process on evaluating National Register eligibility, effects assessments and mitigation, and clarifies for the agency tribal preferences for consultation about discoveries of human remains. Traveling outside of the state, TxDOT met with the tribe to initiate the development of this PA. The use of this PA reduces and focuses consultation on projects truly of concern to the tribe. Before the PA, TxDOT consulted annually with the Tonkawa Tribe on each of the department's approximately 1,000 projects (*4*). A copy of this PA and other example agreements between DOTs and tribes are available on AASHTO's website on tribal consultation (*18*).

The Minnesota and Rhode Island DOTs have PAs with tribes similar to the ones in Texas. The Rhode Island DOT PA with the Narragansett THPO applies to transportation undertakings that have "no effect" on historic properties (*4*). The Louisiana DOT has a PA with the Caddo Nation for projects in those parishes identified as areas of concern to the Caddo Nation. The development of this PA resulted from the Louisiana DOT's participation in the Advisory Council's Pilot Study for Tribal Consultation (which has been cancelled and was not completed). During this study, Louisiana identified the parishes within the state that had the potential to contain properties of concern to federally recognized tribes.

The Georgia DOT has developed MOUs with 7 of the 15 nonresident tribes that have historical or cultural links with the state. The MOUs specify when the tribes are to be consulted and what types of documents and reports the tribes want to review. The MOUs were developed through correspondence and telephone calls with the tribes, as well as through meetings with some of the tribes. The DOT also contacts all tribes quarterly to see if the consultation process is working well and meeting the tribes' needs. Participating tribes receive the state's Transportation Improvement Plan each year and are given an opportunity to comment on the plan, indicating which projects may be of concern to them. The Georgia DOT notes that these MOUs have saved the department money and time, reducing the amount of documentation sent to the tribes and streamlining what the agency needs to do in terms of tribal consultation. Other states that have MOUs with tribes include Iowa and Oklahoma.

Development of MOUs with Iowa's nonresident tribes came out of a conference held in Ames, Iowa, in May 2001, which focused on consultation issues and needs. The DOT provided lodging, meals, and mileage reimbursement for conference participants. Approximately one-third of the 27 invited tribes attended the conference. A follow-up seminar was held to provide tribes with information about Iowa DOT's planning and construction processes. This seminar included a field trip to two ongoing archaeology data recovery projects. Similar tribal summits have been held across the country in Idaho, Minnesota, New Mexico, Pennsylvania, and Washington State. In September 2003, the Pennsylvania FHWA and DOT hosted an Intertribal Summit on Section 106 issues. The primary goal of the summit was to establish a foundation for future consultation with nonresident, federally recognized tribes who had ancestral lands in Pennsylvania (*18*).

Georgia DOT's New Echota Traditional Cultural Property Study is an example of a proactive, pre-project tribal consultation that involved archaeological investigations (*18*). New Echota was the first capitol of the Cherokee Nation, dating from 1825 to 1838. This site is a National Historic Landmark. The Georgia DOT had long-term plans to replace two bridges and conduct road improvements near New Echota. In anticipation of these future projects, FHWA implemented a study to assess the site's traditional cultural significance. Historical research, archaeological investigations, and ethnographic studies were used to define this potential traditional cultural property. The study involved extensive consultation

with three federally recognized Cherokee tribal governments. The three tribal governments were appreciative of the proactive consultation and, as a result, developed a good working relationship with the DOT and FHWA.

Another example of the Georgia DOT's innovative tribal consultation efforts involves a roadway widening project through the Etowah Valley Historic District in Bartow County. The DOT and FHWA determined that the proposed project would not adversely affect the district. The Eastern Band of the Cherokee Indians (EBCI), however, believed that the district could be indirectly affected by increased residential development resulting from the road widening. The EBCI (who reside in North Carolina) was willing to accept the proposed improvements provided the county implement a plan to limit development in the historic district or develop a plan to minimize impacts to archaeological resources in the district. Because of EBCI concerns, the DOT made a commitment to facilitate development of an MOA between Bartow County, the EBCI, and the Muscogee (Creek) Nation of Oklahoma, requiring archaeological surveys on all new private development within the historic district. The county also amended its zoning ordinance to recognize both the importance of the Etowah Valley Historic District and the need for archaeological survey and tribal consultation before any private development activities. The long-term preservation benefits of the MOA and zoning ordinance amendment extend well beyond the immediate road improvement project, and serve as examples of how innovative approaches to consultation can be successfully incorporated into the project development process.

The literature search and survey highlighted several additional innovative approaches to tribal consultation. For example, for one project, the Pennsylvania FHWA division office created a limited-access website that reports on the status of ongoing excavations that involved burials. Access is limited to ACHP, tribes, SHPO, DOT, and FHWA. The website allows key parties to have immediate and equal access to the results of fieldwork. FHWA also promptly posts meeting minutes on the website. FHWA notes that the website has been very effective and streamlines the consultation process. In another example, the California Department of Transportation (Caltrans) regularly requests Native American input on all phases of archaeological investigations. In some cases, reports or chapters in reports are written by tribal members and incorporate traditional knowledge and contemporary ethnohistories, linking archaeology to present day tribal descendants.

As noted in chapter one, several tribes were contacted about this synthesis study, and six responded. Robert Cast, THPO of the Caddo Nation of Oklahoma, provided one example project. Cast notes that the development of the PA between TxDOT and the Caddo Nation was triggered by a pending archeological project at a cemetery associated with the Caddo, located in the right-of-way (ROW) of a widening project. TxDOT did not anticipate that any burials remained because of extensive avocational and professional excavations at this site in the past. As part of the consultation process, the Caddo commented on the project's effect on the site and on the resulting mitigation effort (additional burials sites were found). The tribe also suggested wording for a Texas Historical Commission state highway marker near the site to commemorate the Caddo that had lived in the area. As part of the mitigation effort, the Caddo were provided the opportunity to perform all necessary ceremonies at the cemetery. Currently, the Caddo are in the process of negotiating an agreement with the state and the U.S. Army Corps of Engineers (USACE) for the reburial of the remains at a set-aside Caddo cemetery on USACE property. The tribe considers this project an excellent example of successful consultation.

Cast also described the tribe's relationship with the Arkansas Highway Department and FHWA.

> The folks that work for these two agencies are unique. From the very beginning of our consultations with them, they have gone far above and beyond what may have been required for the Section 106 process. They have involved the Nation in training workshops, face-to face meetings (here at the tribal complex and there), on-site tours of the highway projects and archaeological sites that may be impacted, and have always asked for our input at every juncture of the process (R. Cast, personal communication, 2004).

The Shoshone–Bannock Tribe in Idaho also stressed the importance of continuous and effective communication. On the Bear River Bridge Replacement project, FHWA, Idaho DOT, and the tribe's Cultural Resources Office communicated by means of letters, telephone conversations, and meetings throughout the duration of the project. The tribe's cultural resources staff also met with multiple departments within the agency, in addition to the project's archaeological contractor. The tribe noted that this continual communication resulted in the agencies becoming more sensitive to and respectful of the traditions and history of the Shoshone–Bannock Tribe.

The Wichita and Affiliated Tribes of Oklahoma described their involvement with the Kansas DOT on a project in Arkansas City, Kansas. The tribe's historic preservation representative, Virgil Swift, noted that the project involved an archaeological site to be affected by a highway and levee improvement along the Arkansas River. The Kansas DOT initially met with the Wichita Tribe at the Tribal Complex in Anadarko, Oklahoma, to address Wichita tribal issues. Not all tribal issues were addressed by the DOT, however, because of the many competing interests involved with the project, and Swift felt that the agency did not live up to some agreements that were made with the tribe. In general, however, the Wichita Tribe believed that its concerns were met. The tribe sees the project as a success, because the project was completed, it helped the economy of the Arkansas City area, and

the archaeology done on the site will help strengthen the archaeological and historical fabric of the area. Swift noted that the DOT tried their best to meet the many demands of the multiple groups involved.

The Confederated Tribes of the Umatilla Indian Reservation in Oregon developed a good, cooperative relationship with the Oregon DOT as a result of the inadvertent destruction by that agency of an archaeological site 8 years before. After the site had been destroyed, the tribe monitored the balance of the project to prevent further archaeological site destruction. The tribe also negotiated with the DOT to perform more "traditional use area" identification efforts. Currently, the tribe and DOT are working closely together on a number of bridge projects that have the potential to affect important archaeological sites. One valuable result of this collaboration is the willingness of the DOT to use ethnographic research during initial National Register eligibility evaluations. The tribe feels that this approach is a less destructive method for assessing potential archaeological site significance.

During the Arizona State Road 85 project between Gila Bend and Buckeye, the Gila River Indian Community (GRIC) consulted with the Arizona DOT to minimize impacts to resources of value to the tribe. Previous cultural resource surveys identified 47 prehistoric and historic trails running across the existing highway. Inventories conducted by GRIC's Cultural Resource Management Program showed that many of the trails were traditional cultural properties. GRIC's Cultural Resource Management Program mapped and recorded a sample of the trails on either side of the highway to assist in evaluating potential impacts from proposed road improvements. As a result, 49 miles of trails were examined, and the results of this study were used to create an exhibit at the tribe's new heritage facility.

Russell Townsend, the EBCI's THPO, provided another case from Tennessee that illustrates how an initially negative situation resulted in a more collaborative relationship between a tribe and a DOT. The Tennessee DOT began a road widening project in the late 1990s, but never consulted with the tribe. Construction was eventually halted owing to tribal concerns. The EBCI, FHWA, and Tennessee DOT subsequently executed an MOA outlining how archaeological investigations would be conducted, and required that human remains be left in place. A cement cap would be placed over the remains to protect them from heavy equipment. Since this project, the Tennessee DOT has begun to work more closely with the EBCI. The tribe now sends representatives and traditional leaders to Tennessee to rebury materials encountered on agency projects. The tribe, FHWA, and Tennessee DOT are also meeting more regularly. These meetings are used to review the status of ongoing projects. The EBCI attributes these improved relations with the Tennessee DOT to three factors: increased FHWA involvement with the DOT on tribal issues, tribal pressure during the above-mentioned project, and programmatic approaches to consultation.

ENGAGING THE PUBLIC

The majority of the DOTs' public outreach efforts are project-specific and often ad hoc, involving the development of a temporary exhibit on an excavation, a brochure, site tours, or public lectures. A few states, however, have strategically placed public outreach as an important component of their archaeological investigations.

The Pennsylvania DOT (PennDOT) regularly publishes, through the Department's *Byways to the Past* series, small, publicly oriented booklets on its archaeological data recovery projects. The DOT also has a *Byways to the Past Technical Publication Series*. The latter distributes the results of PennDOT-sponsored research in archaeology, including large-scale data recovery projects, to professional archaeologists and the interested public. The reports in this series are distributed on CDs. In the past, the Delaware DOT has printed and distributed 500 copies of its archaeological reports for both the public and professionals. Currently, the Delaware DOT is focusing on distributing reports through the Internet and the use of CDs.

The New Jersey DOT, in consultation with the SHPO, created a publicly oriented website reporting on all phases of an archaeological data recovery within the Raritan Landing Archaeological Historic District, near New Brunswick, New Jersey. The website was continually updated as the project generated new information. This website experienced approximately 57,000 visits during the 4-year project. The New Jersey SHPO noted that this and similar websites are popular with the general public and with professional and avocational archaeologists. The primary data recovery report for the Raritan Landing project is being written in a public-friendly narrative form in contrast with the normal, voluminous, jargon-filled technical report. Technical information is provided in stand-alone reports for both professional archaeologists and the interested public.

Caltrans has produced documentary videos as part of several major data recovery projects. One example is "Privies to the Past," a documentary on historic archaeology in West Oakland. This video was produced as part of the rebuilding of the Cypress Freeway after an earthquake. A second example is "The Obsidian Trail," a video on the archaeology of the Owens Valley, with special emphasis on information gained from the study of obsidian artifacts. This video was produced in conjunction with a series of mitigation projects for the widening of Highway 395. Both videos have been shown nationally on public broadcasting stations.

Some DOTs also publish small, publicly oriented booklets as part of their data recovery efforts. Two examples are

the booklets on Boston's "Big Dig" (*19*) and an introduction to Vermont archaeology based on archaeological work along the Chittenden County Circumferential Highway (*20*). The creation of publications and other public outreach efforts are often included in the Section 106 agreement documents and budgets associated with data recovery projects. These types of publications share the results of publicly funded archaeology with the public, demonstrating to the public the value of this work.

TxDOT's public outreach efforts have been very successful; so successful that the SHPO strongly endorses the inclusion of public outreach as an integral part of all data recovery projects in the state. One of the DOT's key public outreach efforts was the development of two history modules for use in schools, based on transportation-related data recovery projects. Each of the agencies' data recovery projects includes contract deliverables that feed information into the modules. The DOT has also funded the authoring of manuscripts for professional and avocational publications (these publications are included as one of the deliverables for data recovery projects).

The Georgia DOT has created "educational trunks" on archaeology for high school and 8th grade students, and the agency is in the process of developing one for 4th graders. The DOT is also in the process of developing an African–American archaeology educational trunk for high school students. Funding for these trunks comes from data recovery projects, and they are given to county school systems where the projects take place. These trunks are also available on loan from the DOT to other county school districts throughout the state and the Southeast region. Consultants performing the data recovery projects developed the trunks.

Another example of outreach to school children is the West Virginia DOT's "Kids Dig Reed," an educational website on the Reed Farmstead property. This interactive website includes a history of the property, information on the property's archaeology and artifacts, games, and a place for children to submit questions about archaeology (*21*). The North Dakota DOT is using Transportation Enhancement funds to produce an educational video and curriculum based on a data recovery project at an earthlodge village near Bismarck. This public outreach effort also includes interpretive displays at the Mandan Public Library.

A few DOTs also seek the active involvement of the public during archaeological investigations. On a bridge replacement project that affected a circa 3000–750 B.C. site, the Missouri DOT invited local citizens to participate in parts of the site's data recovery. More than 400 people, including students, participated in the excavation. As a result, the local community learned about the history of the site and why the DOT was involved in such historic preservation efforts (*4*).

SUMMARY

Good, consistent communication among parties is clearly the key to productive archaeological investigations. Effective communication practices include

- Having regular meetings that review ongoing and future projects;
- Participating in collaborative, proactive efforts;
- Establishing joint objectives, goals, and processes; and
- Having upper management support and directives to improve and maintain good relations.

Discussions and consultations held outside of the requirements of individual projects are an effective means of building trust and communication. This is certainly the case with tribal consultation, where general discussions on protocols and important issues are best held without the constraints and potential conflicts inherent in specific transportation projects. As discussed, several FHWA offices, state DOTs, and tribes have codified these protocols in MOUs and PAs.

Poor communication among agencies and between agencies and tribes results in conflict, mistrust, project delays, and increased project costs. Practices that improve and maintain good communication, however, take time and a commitment from all parties involved. They also require activities that are not linked to specific projects. It is often difficult for DOT staff to participate in nonproject-specific activities given scheduling constraints and agency priorities. DOT, SHPO, FHWA, and tribal representative responses to the NCHRP synthesis survey demonstrate, however, the long-term benefits of these nonproject-specific efforts.

Few states have strategically placed public outreach as an important component of their archaeological investigations. Rather, the majority of public outreach efforts are project-specific and often ad hoc. The survey responses did not provide specific information on why this was the case. It can be inferred from the responses, however, that the need to keep project costs low is most likely the primary reason (see chapter six).

CHAPTER THREE

INTERNAL BUSINESS PRACTICES AND PROJECT DELIVERY

It became evident from the DOT survey responses that internal business practices within a transportation agency have an impact on an agency's ability to streamline the management of archaeological investigations and to enhance the results of these efforts. Internal practices include the size and make-up of DOT staff, the structure of consultant contracting, and the location of decision-making authority. Another important aspect of internal practices is the way in which archaeological investigations (and Section 106 compliance) are integrated into project design and the NEPA decision-making process. If these investigations are not appropriately integrated into the NEPA process and project design, delays and conflicts result.

INTERNAL BUSINESS PRACTICES

Staffing and Consultant Contracting

State DOTs use private-sector firms or sister state agencies to perform the majority of archaeological investigations. Caltrans district offices typically use an on-call contracting format to hire outside consultants. Individual task orders are written for specific projects and given to one of the on-call consultants. This results in a faster project start-up because the district does not have to go through the procurement process to obtain a consultant for each project. For smaller projects, Caltrans' districts and headquarters have on-call arrangements (interagency agreements) with state universities. The agency also uses in-house staff or a combination of in-house staff and outside consultants for these small projects.

The Wyoming DOT uses master consultant contracts for survey and site evaluation projects, keeping consultants on retainer. This agency uses a standardized scope of work and a two-page task order so that contractors can immediately begin to work on a project.

The Delaware DOT uses cultural resource management Parent Agreements, setting up a dollar ceiling for each 3-year consultant contract. Then, the agency negotiates the scope and budget for each task order with the consultants. Because the contract funds have already been established, the DOT's CRM staff simply requests the specific task amount from the department's financial management office, sets up the task-specific funds, and then authorizes the consultant to begin work. In this system, it takes 1 week to have a funded task order in place. The Delaware DOT also uses environmental or engineering firms as the prime consultant on projects, and the prime consultant hires CRM firms as their subconsultants. In such cases, there is less flexibility in conducting archaeological investigations, as changes in a scope of work involve a level of administration that does not exist under the Parent Agreements with CRM firms.

Some of the DOTs voiced concerns about outsourcing the majority of their archaeological investigations. For example, in the past, the Nevada DOT conducted most of its work in-house and, as a result, it was able to "get out in front" of the projects during the development phase, conducting archaeological surveys before the engineers got too far along on design. DOT archaeologists were able to influence design and avoid significant sites. Given the openness of the land in western states, the agency had the flexibility to change the design to avoid sites. This minimized the number of large-scale mitigation projects that were needed. Staff archaeologists worked with design engineers on a one-to-one basis, so that there was continual communication between the archaeologists and designers.

With recent increases in outsourcing, this type of close interaction with the project designers is no longer possible, particularly when design is also done by outside contractors. This linkage between design and the results of archaeological studies is diminished even more when the designers work for one firm, the environmental and NEPA specialists work as a subcontractor to the design firm, and the archaeologists are in yet another firm, working as a subcontractor to the NEPA firm. Given the almost exclusive use of contractors and the reduction of in-house archaeological staff, Nevada DOT's CRM staff focuses on managing contracts and consultants.

The Utah DOT has in-house archaeological expertise in each regional office. Agency engineers and planners believe that in-house staff is more responsive to project needs than outside experts. There is also more consistency when regional archaeologists do the work. The Utah DOT does outsource large archaeological projects. In these cases, the regional archaeological staff oversees the outsourced work to ensure quality and consistency.

PennDOT found that hiring in-house professional archaeologists (whom the agency refers to as "qualified professionals"), and placing these individuals in the district offices, has

significantly improved management of archaeological investigations and project delivery. The primary reason for this improvement is that the cultural resource decision makers are in-house, and the designers and engineers within the department respond better to this in-house expertise than to outside reviews and comments. This is particularly the case after some trust building has occurred among internal archaeological staff and DOT engineers and designers. Another benefit is the improved communication among agency staff working on a project. There is no need to schedule every meeting or interaction, as would be the case if an outside consultant were used. Having the qualified professionals serve as both Section 106 process managers and liaisons with archaeological consultants also results in a consistency in approaches and standards used within the districts.

The Wyoming DOT also stressed the importance of having qualified in-house staff. New archaeologists hired by a DOT should have a demonstrated record of research, publication, and standing in the larger professional community within the state. This approach results in better decision making, because decisions are based on a depth of experience.

Some DOTs use state universities to conduct their archaeological investigations, rather than contracting with private CRM firms. The Oklahoma DOT, for example, has an interagency agreement with the University of Oklahoma. The university does the bulk of the agencies' work (85% to 95%), and the university's staff, which is assigned to do only DOT work, is under the direction of the agencies' archaeologist. Flexibility and decreased administrative and contractual burdens are the primary reasons why DOTs like to work with state universities. With this type of arrangement, the university can easily respond to changes in project design and NEPA issues early in the project development phases. The Oregon DOT also noted that their university contractor is well known and respected by the SHPO and the state's tribes. As a result, archaeological consultations proceed very smoothly because of this high level of trust.

In New York, the State Museum (part of the state's Department of Education) provides archaeological services to the New York State DOT. The museum has a large staff available for DOT work. Regional DOT offices develop estimates of the department's annual needs in terms of archaeological work and forward this information to the DOTs' Cultural Resources Section of the Environmental Analysis Bureau (located in Albany), which then coordinates these needs with the museum. The museum works with the agency to set up an annual CRM program based on the regions' needs. Approximately 50% of the DOT annual work program is done by museum staff and crews. The other half is accomplished through subcontractual arrangements the museum has made with four universities and three private firms. The DOT participates in the subconsultant selection process, which takes place every 3 to 5 years. The partnership with the museum saves time; when the agency needs the museum, it is available and can quickly respond. The museum also handles all of the day-to-day management of the archaeological investigations and is responsible for controlling the quality of work performed by its subconsultants. DOT CRM staff can then focus on project design, NEPA and New York State Environmental Quality Act decision making, and Section 106 compliance. The New York State DOT noted that their program with the State Museum results in standardization in reporting and documentation, which facilitates and streamlines SHPO reviews, because the SHPO is comfortable with the standards that are used. This program is also cost-effective for the DOT, as they do not have to deal with layers of engineering or environmental consultants to reach the CRM professionals who do the work.

Funding of Positions for SHPOs

One approach that some DOTs have used to streamline the review of archaeological projects is to fund a project review position(s) within their respective SHPO. Eight of the DOTs and FHWA division offices responding to this survey currently fund review positions at SHPOs. The Ohio DOT funds two positions at its SHPO and this staff works only on DOT projects. Having these two dedicated positions facilitates Section 106 consultation, because these individuals can easily attend field and office meetings and immediately respond to project needs as they arise. Unlike other SHPO staff, these individuals do not have conflicting project review priorities. The DOT oversees the work load of these two individuals and sets their work priorities. The DOT and FHWA meet every month with the two funded SHPO reviewers. It should be noted that even though these individuals are dedicated to DOT projects and work under the direction of the agency, they do not always agree with the DOT's positions. Because there is a constant dialogue between the agency and SHPO staff, however, they can more easily resolve any differences of opinion.

The Idaho DOT has a cooperative agreement with the Idaho SHPO to help fund a position at the SHPO. The individual in this position reviews the DOT's cultural resource reports, and the SHPO charges the DOT an hourly rate for these reviews. The Louisiana DOT funds both a review position and a student worker at the SHPO through an interagency agreement. The Arkansas DOT and FHWA have an MOA with the SHPO that establishes a SHPO review position. This individual does not review DOT projects to avoid any conflict of interest, but assumes a significant portion of the workload from the other SHPO reviewer, allowing the latter to devote more time to DOT reviews. The Kentucky FHWA division office funds a position within the SHPO. FHWA noted that having a person dedicated to transportation activities has helped expedite the project review process, and that no other approach has been as successful within the state.

Caltrans has an exchange program with the SHPO wherein three or four Caltrans employees go to the SHPO on

a rotating basis to assist in the review of other agencies' projects. Owing to the size of the state and the volume of Caltrans projects, Caltrans reviewers may also assist in the review of agency projects from outside their own DOT district. SHPO supervisory staff also ensure that a "firewall" remains in place between the Caltrans staff and other SHPO review staff. In the past, SHPO staff has also worked for Caltrans on a temporary basis. This exchange effort helps the SHPO with their workload, and it also promotes a good relationship between the agencies as staff get to experience the "other side" of the Section 106 consultation process.

Who Are the Decision Makers?

The survey showed that internally, decisions to implement innovative archaeological studies were made by the DOT staff archaeologist or CRM specialist. If the approach was new and required funds not originally budgeted for a project, the ultimate decision was made by upper project management.

The survey responses also showed that the majority of DOTs made decisions on both standard and innovative archaeological investigations in consultation with the SHPO, and that a consensus on these approaches was usually reached. The Ohio DOT noted that every decision on complex projects is a multidisciplinary decision, where all aspects of design and resource review associated with a project are considered. The DOT needs to ensure that they do not create problems in other areas when they make a decision about one particular resource category or project design action.

As noted previously, some DOTs reported having poor relationships with their SHPOs. One of these DOTs stated that it tended to give the SHPO's views precedence and that the state's FHWA division office took the same position. The agency did not attempt to negotiate a solution with the SHPO when there was a disagreement, because this took too much time and affected project delivery schedules. Another DOT commented that recently their SHPO was becoming more resistant to innovative approaches; therefore, it was difficult to reach a consensus on using these approaches.

A third DOT noted that the use of creative mitigation for archaeological resources was generally opposed by its SHPO. The SHPO was not willing, for example, to "sacrifice" portions of an archaeological resource to gain a higher public benefit on a project. This same DOT also stated that there was a general feeling within the department and FHWA that the SHPO "must be appeased" to avoid project delays. Any disagreement could affect a project's schedule. One of the responding FHWA division offices made the same observations in terms of the relationship between its DOT and the SHPO. In addition, one of the CRM firms responding to the survey noted that in its state the DOT believed that it was important to always please the SHPO.

PROJECT DELIVERY—INTEGRATION OF SECTION 106, NATIONAL ENVIRONMENTAL POLICY ACT, AND PROJECT DESIGN

As noted in chapter one, an important aspect of environmental streamlining is the reduction and elimination of delays and unnecessary duplication in environmental review procedures. The survey, therefore, asked that DOTs and FHWA describe effective practices that integrate the timing and scope of archaeological investigations into the NEPA and project development processes. The focus was on practices that resulted in expedited project reviews and reduction of costs.

On widening projects and bridge replacements where NEPA compliance often involves an EA, the majority of DOTs conducted comprehensive archaeological surveys early in project development because alternatives for these projects are spatially restricted. National Register evaluations and the development of plans for mitigation of adverse effects are frequently finished by the time a FONSI is issued. On widening projects in Georgia, the DOT generally conducts an intensive level survey at the conceptual design stage. At times, however, fieldwork is not done until after the completion of the analysis to identify practical and reasonable alternatives. Archaeology is rarely an issue during the alternative screening process. Rather, alternatives are selected for further detailed environmental study on the basis of historic architecture, Section 4(f), and ecological issues.

For projects that are CEs under NEPA, the DOTs generally complete archaeological surveys and National Register site evaluations before the release of the CE document. In Pennsylvania, however, the DOT has problems integrating archaeological studies into CE level projects, because the CE process moves very quickly. To deal with this situation and with projects where access to private property is not granted before the conclusion of NEPA compliance, the agency executes individual Section 106 programmatic agreements for CEs. The PAs stipulate the process to be followed once the DOT purchases the ROW for the project. PennDOT recognizes that this process results in the execution of too many project-specific PAs.

On large projects with multiple alternatives, the DOTs often use a phased approach to archaeological survey. The DOTs conduct a literature and records search of the alternatives being studied, followed by a field survey of high probability areas; that is, areas that may contain a fatal flaw such as sites with burials. A comprehensive survey is done only on the preferred alternative, before the final EIS or release of an EA for public review and comment. In most cases, the DOTs noted that their FHWA division offices wanted National Register eligibility evaluations conducted on all sites within the preferred alternative before the final EIS or before issuing a FONSI.

In Ohio, it is standard operating procedure to not conduct archaeological surveys on large-scale or complex projects until a preferred alternative is identified. Rather, a historic context is developed on the area encompassing all of the alternatives, focusing on the identification of potential fatal flaws in the alternatives. The historic context is based on a comprehensive literature study and records review. The DOT has found that doing archaeology in a broad corridor or for multiple alternatives is too costly, and that it is rare to find a significant site requiring a major shift during the NEPA analysis or project design. The DOT found that other environmental issues had a greater impact on the NEPA and project design process. The Virginia DOT has an agreement with its SHPO that recognizes the departments' discretion to conduct archaeological surveys only on the preferred corridor when projects involve the analysis of multiple alternatives. The DOT takes this position because in Virginia archaeological resources do not typically influence corridor selection and minor alignment shifts during design can avoid many significant archaeological sites.

Some DOTs and FHWA division offices use archaeological predictive modeling to evaluate multiple alternatives on large projects. This is done because of the expense of conducting archaeological surveys of multiple alternatives. The results of these modeling efforts (and field testing of the models) are used to evaluate the potential of all alternatives to affect archaeological resources. Instead of using predictive models, some DOTs perform a sample survey of each of the alternatives to document the potential of each alternative to contain significant archaeological resources. As with predictive modeling, the results of the sample survey are used to compare the potential affects of each alternative. Commonwealth Cultural Resources Group, Inc., from Michigan, noted that in its state, modeling is used to predict the number and types of archaeological resources within alternatives. In addition, they conduct deep testing of major water crossings where there is a potential for buried sites. Full identification surveys do not occur until the preferred alternative is selected.

Several eastern DOTs postpone archaeological investigations until after the issuance of a FONSI or a Record of Decision (ROD) for an EIS because of private property issues and the high cost of conducting comprehensive surveys in heavily wooded or agricultural areas. For example, in Pennsylvania, alternatives usually cross private lands and, if FHWA and DOT conduct any archaeological testing, recovered materials belong to private property owners. FHWA and the SHPO (and tribes when prehistoric sites are involved) want to avoid situations where materials are returned to property owners. This, in addition to cost, is the reason why predictive modeling is used to evaluate alternatives in Pennsylvania. For EISs, FHWA and PennDOT conduct archaeological fieldwork only after they have identified the preferred alternative. In some cases, however, survey and testing work is conducted after the issuance of the ROD and purchase of the ROW. In such situations, the FHWA, DOT, and SHPO execute a project-specific programmatic agreement, before issuing the ROD, stipulating how archaeological investigations are to be performed.

TxDOT finds it difficult to complete all National Register eligibility evaluations before issuing a FONSI. The DOT's policy is to decline to do testing until landowners agree to relinquish artifacts found during fieldwork. Otherwise fieldwork takes place after ROW purchase. For EISs, the agency completes as much of the archaeological survey as possible within the limitations of rights of entry, and may complete the inventory after the ROD. Again, this is done because of issues associated with access to private property. As a result, TxDOT often conducts noninvasive assessments of alternatives and uses this information to evaluate the relative impacts to archaeological resources.

The North Carolina DOT attempts to conduct National Register evaluations as early as possible in the NEPA and project design processes. The agency does these evaluations on all alternatives subjected to detailed study to adequately evaluate the impacts of the alternatives. The DOT conducts this work up front to avoid having to redesign projects to miss significant sites, which in turn avoids remobilization to do more archaeology on newly included areas resulting from these design changes. The agency works to avoid National Register eligible sites during project development; therefore, they need to know where these sites are. The DOT does not want to make changes in design that end up avoiding nonsignificant sites.

As an example of an effective practice that links archaeological field investigations to ongoing project design, the New Hampshire DOT meets with the SHPO and FHWA once or twice each month. If a project design is being performed in-house, DOT highway or bridge design staff participates in these meetings. If a consultant is responsible for the design, the consultant also attends. Archaeological consultants may also be invited. Having these meetings as part of the ongoing design effort allows the DOT to determine how to deal with archaeologically sensitive areas early in the project delivery process. The agency can also examine avoidance strategies and evaluate the need for phased archaeological investigations.

SUMMARY

Several survey responses discussed how internal business practices can affect the quality and effectiveness of archaeological investigations. These practices include the structure of consultant contracting, funding of SHPO positions, and the way in which archaeological investigations are integrated into project design and the NEPA decision-making process. For example, many DOTs use outside consultants to conduct archaeological investigations. Some DOTs noted that having

on-call or master contracts with consultants resulted in rapid initiation of projects with minimal administrative paperwork. Others, however, felt that the use of outside consultants, as opposed to in-house staff, reduced the close interaction between project designers and archaeologists and lessened the ability to quickly respond to changing project needs. Using in-house staff resulted in more consistency in work products and streamlined communication between archaeologists, project engineers, and planners. A few DOTs use universities or other sister state agencies to conduct archaeological investigations. The benefits of this approach included increased flexibility, decreased administrative and contractual burdens, and consistency in work.

Several DOTs fund project review positions within their respective SHPOs as a means to streamline the review of archaeological projects. Both SHPOs and DOTs are pleased with the results, which include reduced project review time, more consistent access to SHPO staff throughout the project planning process, and improved communication and relationships between the agencies. Another internal business practice that streamlines project delivery is effective integration of archaeological investigations with the NEPA and project design process. Although how this integration is specifically accomplished varies from state to state, a common approach is the use of phased archaeological survey and identification.

CHAPTER FOUR

PRE-PROJECT PLANNING

Pre-project planning efforts establish frameworks and procedures that guide future project development and associated historic preservation reviews. These efforts include, but are not limited to, PAs, IT and information management tools, and syntheses and treatment guidance for categories of archaeological resources.

PROGRAMMATIC AGREEMENTS

PAs are formal, legally binding agreements between a federal agency and the ACHP stipulating the process for compliance with Section 106. Most people are familiar with "project-specific" PAs, which are used to manage compliance for large, complex projects and situations where it is difficult to determine the effects on historic properties before a federal action. Pre-project planning often involves procedural PAs that establish a process through which the agencies will meet their Section 106 compliance responsibilities for an agency program, a category of projects, or a particular type of resource. In the case of transportation projects, state DOTs are often parties to these agreements. Procedural PAs, especially those that delegate review authority to the state DOT, are viewed by DOTs and FHWA as one of the most effective tools to streamline and enhance the Section 106 process, including archaeological investigations. These PAs result in reduced project timelines and greater certainty in project development outcomes (*17,22,23*).

Delaware, Georgia, Maryland, New Jersey, Pennsylvania, Rhode Island, Washington State, and Wyoming have what is referred to as a "minor projects" PA (*17,23*). These PAs provide a list of transportation-related activities that will have no effect on historic properties (including archaeological sites) and allow the DOT to proceed with such activities without consultation with the SHPO or ACHP. These PAs decrease the amount of project-by-project Section 106 review, reducing the work loads of SHPOs and DOTs and shortening DOT project delivery time.

PennDOT has a PA that moves beyond the normal minor projects agreement. Like most minor project PAs, Pennsylvania's includes a list of projects exempt from Section 106 review. The PA also has provisions allowing the DOT's "qualified professionals" to review, without consultation with the SHPO or ACHP, certain categories of projects that have no affect on historic properties and are CEs under FHWA's NEPA regulations (*17*). Having the PA in place reduces paperwork and moves the project more quickly through the project development process. The DOT is also doing a better job of historic preservation, as staff is a little more careful because the requirements of the PA are so tightly written.

Caltrans has a procedural PA, executed in January 2004, which delegates extensive review authority to the DOT. The PA includes lists of "screenable" undertakings, which can be exempted from further Section 106 review, and a list of resource categories that are exempt from evaluation. The latter includes archaeological sites such as isolated prehistoric or historic finds, isolated historic refuse dumps and scatters that lack specific historic associations, and isolated mining prospect pits.

Under the PA, Caltrans also has the review authority to make findings of "no historic properties affected" or "no adverse effect with standard conditions." In terms of the latter finding, Caltrans can assume that a site is eligible for the National Register "for the purpose of the undertaking," without conducting subsurface testing. These site areas are then defined as Environmentally Sensitive Areas and are protected from project construction activities. Caltrans notifies the consulting parties, including the SHPO, of these findings and makes the findings documentation available to all parties.

The PA has reduced the paperwork handled by Caltrans, the SHPO, and FHWA; and Caltrans can move projects more quickly through the review process. Furthermore, as a result of the training that is required as part of the implementation of the PA, the quality of the products produced by Caltrans staff has greatly improved.

The New Jersey SHPO, DOT, and FHWA state office have a minor project PA, a PA that specifies the terms and responsibilities of all three parties in the Section 106 consultation process, and an unofficial agreement for the development of abbreviated archaeological survey reports. The latter agreement is for situations where background research indicates a low potential for National Register-eligible archaeological resources within a project's area of potential effects. This agreement only applies to surveys conducted by in-house DOT staff.

One of the most comprehensive PAs developed to date is Vermont's delegation PA. Under this agreement, the Vermont

Transportation Agency (VTrans) completes all of the following activities without additional consultation with the Vermont SHPO and ACHP:

- Identifies historic properties,
- Determines National Register eligibility,
- Makes formal findings of "no historic properties affected,"
- Makes formal findings of "no adverse effect" or "adverse effect," and
- Implements standard mitigation measures to resolve adverse effects to historic properties (*22,23*).

To implement this PA, VTrans has on staff two full-time historic preservation professionals. These individuals serve as Deputy Historic Preservation Officers within the DOT, one responsible for archaeological resources and the other the built environment. The PA also establishes a process whereby the SHPO or any other party can intervene in the process if they have a concern. All VTrans decisions are fully documented using standardized procedures and forms, and these documents are readily accessible to all parties. Since its execution in 2000, the PA has worked extremely well and has extensively streamlined and shortened the project review process (G. Peebles, personal communication, 2002; Scott Newman, personal communication, 2002).

As noted previously, procedural PAs can be used to address a category of resource. The Illinois DOT has a PA for resolving adverse effects to prehistoric habitation sites in the state. The PA involves only sites that are significant solely for their information potential. These sites do not have the potential to contain human remains nor do they possess traditional cultural values for Native Americans or other traditional communities. These habitation sites are the most common archaeological sites encountered on Illinois DOT projects and usually involve the use of data recovery to mitigate project impacts. The procedures stipulated in the PA eliminate the need for individual project-by-project MOAs (*4*).

The AASHTO Center for Environmental Excellence website provides an on-line "how-to" tool kit for creating Section 106 programmatic agreements (*17*). The tool kit serves as a step-by-step tutorial, presenting information, guidance, and recommendations on developing and implementing agreements among state DOTs, FHWA, SHPOs, and ACHP. The tool kit not only describes how to write an agreement, but also provides guidance on how to build trust among parties to create an effective agreement that streamlines and enhances Section 106 compliance.

COLLECTION AND CURATION STANDARDS AND GUIDELINES

A growing problem area associated with archaeological investigations is artifact curation. Many repositories for archaeological materials are reaching their storage capacity, and a few have stopped taking in any new collections (*24*). To address this issue, several states have instituted innovative approaches to artifact collection and analysis, both in the field and in laboratories.

The Nevada DOT has stopped collecting artifacts during survey. This was initially done at the behest of federal land managing agencies when a DOT project crossed federal lands. The DOT has also developed sampling methods for certain categories of material that occur in high frequencies, such as waste flakes and some types of historic artifacts. In addition, the DOT analyzes some categories of material in the field, such as ground stone and bulk historic materials, and leaves these materials on the site. When testing for National Register eligibility, the DOT collects only enough material to support a decision on eligibility.

Oklahoma DOT's preliminary National Register eligibility evaluations often involve the use of shovel testing. In such cases, artifact analyses are performed in the field and the artifacts are placed back into the shovel test pits, unless a landowner has specifically given the DOT the right to remove artifacts from their private property. When National Register evaluation efforts involve excavation of test units and trenching, the artifacts are returned to the landowner, if he or she wishes, after laboratory analyses are completed.

For the past 20 years, some federal land managing agencies in Wyoming have required the collection of only diagnostic artifacts during surveys. On nonfederal lands, the Wyoming DOT uses the same process and requests that the landowner sign a donation agreement for the curation of diagnostic materials at the University of Wyoming's curation facility. For test excavations evaluating National Register eligibility, the DOT uses the professional standards in federal regulations dealing with collections (36 CFR Part 79); however, bulk materials such as brick on historic period sites are measured and discarded in the field.

In Oregon, according to Archaeological Investigations NW, Inc., a local CRM consulting firm, state policy allows survey teams to take digital photographs of artifacts in the field rather than collecting them. This process, however, requires that the team include highly skilled individuals who can identify and record these materials in the field. This process reduces subsequent laboratory analysis time and curation costs.

The Montana DOT, in two instances, conducted extensive testing and data recovery on a group of sites and agreed to turn the artifacts over to tribes after the analyses were completed. The tribes reburied the artifacts near the sites, and the locations of the reburied materials were recorded using a Global Positioning System device. In some cases on tribal land, the DOT has put artifacts back into test units after testing is completed.

The New Jersey DOT has an Archeological Collections Donation Agreement, which offers local repositories the

opportunity to take on long-term curation of collections recovered from DOT property. The agreement includes a set of criteria that the repository must adhere to before receiving the collection.

INNOVATIVE STATE HISTORIC PRESERVATION OFFICE GUIDELINES

A search of all of the SHPO websites identified only one state (Vermont) that had moved beyond the standard approaches to archaeological investigations. It should be noted that not all SHPOs have posted their state's guidelines on their websites. What makes the Vermont guidelines unique is inclusion of explicit guidance on establishing the significance of prehistoric sites, listing the characteristics that make a site eligible for listing in the National Register. The guidelines also indicate the categories of data that sites must contain to address the important research topics for the state. These questions are included in a historic context on "Vermont's Prehistoric Cultural Heritage." The Vermont guidelines also include extensive discussions on integrating public outreach and education into archaeological investigations and sets standards for this outreach. The guidelines also include a listing of recommended projects and programs for public outreach. Finally, the guidelines stress many times that one of the goals for Vermont archaeology is to increase creativity and flexibility in the conduct of archaeological studies (*25*).

INFORMATION TECHNOLOGY AND INFORMATION MANAGEMENT SYSTEMS

State DOTs are using various IT tools to manage archaeological resource data. The most common tools are GIS and database programs such as Microsoft Access (*13*). These IT tools are used to maintain site inventories and develop computerized archaeological predictive models.

Archaeological Predictive Modeling

One of the most comprehensive and longest operating, transportation-related archaeological GIS databases and predictive models is Minnesota DOT's Mn/Model. From 1995 to 1998, using funds from FHWA, the Minnesota DOT developed Mn/Model to improve the ability of archaeologists to assess the likelihood of finding archaeological sites throughout the state. Creation of the model involved the collection and mapping of both environmental and archaeological site data for the entire state. Mn/Model is a statistically based predictive model that displays the probability of finding a pre-1821 archaeological site at any given location. Probability categories are based on statistical correlations between known archaeological site locations and environmental attributes. The model maps low, medium, high, and unknown probabilities of finding an archaeological site in a particular area (*13,26*).

Mn/Model also includes three-dimensional, GIS-format geomorphic maps for a number of the state's major river valleys, in addition to a bog region and several small upland locations. These maps are used to define Landscape Suitability Ratings. These ratings indicate the potential for and possible depth of buried sites, in addition to whether or not the surface of an area is disturbed. By consulting the Landscape Suitability Rating maps, the DOT determines whether a subsurface survey is necessary and if a proposed project might disturb buried sites.

The North Carolina DOT, with funding from FHWA, has completed the first stage of a GIS-based Archaeological Predictive Model (APM) for seven counties in the state. This first phase of work involved collecting digital environmental data, digitizing and georeferencing data from archaeological sites and historical maps, and creating a Microsoft Access database. The next task will be to create a predictive model that will indicate whether any given 30-m-square area within a project corridor has a high, medium, or low probability for containing archaeological sites. The model is currently focused on prehistoric sites. This predictive model will allow the DOT to choose highway alternatives that have the least costs for complying with NEPA and Section 106. Eventually, the APM, which is housed in the Office of State Archaeology (located within the state's HPO), will be developed for the entire state of North Carolina (*27*). The North Carolina DOT noted that once in place, the models will be continuously tested and refined through future transportation projects within the areas covered by the APM.

The use of archaeological predictive models is relatively new to the transportation project development process. Several military installations across the country developed such models in the 1980s and 1990s and have used these models with mixed success. In 2002–2003, Statistical Research, Inc., and the SRI Foundation carried out a project, funded by a Department of Defense (DoD) Legacy Grant, to evaluate the use of archaeological predictive models on military installations (*28*). The project was designed to answer four questions:

- Do predictive models that have been created for military installations work?
- Can they be refined to work better?
- Are they sufficiently accurate so that land managers and SHPOs can use them in evaluating management decisions about installation of archaeological resources?
- Can a predictive model be integrated into a more dynamic operational model that would be useful across the DoD to increase cost-efficiency of cultural resource management at large installations?

To address these questions the project team first tried to determine the pervasiveness of predictive modeling in the military through a questionnaire sent to installations representing all branches of the service. Although not intended to be a complete canvassing of the military use of predictive models, the

objective of the questionnaire was to achieve a reasonable sample from which inferences could be drawn. The second step was to choose models from four of the responding installations for an in-depth evaluation of their technical quality, accuracy, and general utility as a cultural resource management tool. The four installations included Fort Bliss in Texas/New Mexico, Fort Drum in New York, Eglin Air Force Base in Florida, and Fort Stewart in Georgia (*28*).

The study produced several important findings about the use of predictive archaeological modeling at military installations. These findings, which follow, are presented in this synthesis report because they provide transportation planners and historic preservation specialists working with state DOTs with valuable guidance and lessons about archaeological predictive models.

> Despite all the interest in predictive modeling in the military, there is no centralized instruction on how to create, use, and maintain these models. Each installation is left to surmount the difficulties associated with site recording, GIS development, and predictive modeling by itself. This approach has encouraged innovation and led to the development of a wide variety of models, but the potential of many of these models is restricted because of decisions made early in the process. It was clear that installations could have profited greatly from one another's miscalculations and successes.
>
> Most models are rudimentary in nature. In many respects, predictive modeling has witnessed a loss of sophistication in the models developed in recent years. Most models are simple intersection models or simple correlation models. Few models are based on multivariate statistical techniques or theoretically based constructs about past human behavior. Because of the simplistic nature of the models, some installations have added judgmental criteria into their models to increase their accuracy; even though by doing so they reduce their systematic and objective character.
>
> Models tend to be restricted to predicting surface manifestations. Despite the importance and predictability of buried sites, geomorphology is not a component of most modeling efforts, and neither are remote sensing techniques. The lack of satellite imagery is particularly noticeable. Such imagery can be a useful proxy for ground cover and land surfaces. The imagery exists in digital form that can easily be included as a separate theme in an installation's GIS. Importantly, much of this imagery is available to the military at little or no cost.
>
> In most cases, models are not integral to the historic preservation compliance process. In part this may be a result of models going out of date. While much effort has gone into creating models, little effort has been expended in refining them. Models are treated as final products rather than being viewed as a process that involves continual modification and improvement. But even for models that have been refined and kept current, decisions regarding level of inventory, determinations of National Register eligibility, and resolution of adverse effects rarely include model predictions. Yet, this does not have to be the case. How many acres should be surveyed? Where should they be conducted? How should sites be identified (e.g., shovel testing or pedestrian survey)? These are questions that predictive models can assist in answering. Determinations of eligibility require archaeologists to state why a site is significant, and what can be learned from the site. Models could be used to highlight why a particular site's location is unusual or typical of a class of past behaviors. Data recovery plans could incorporate model predictions about the type of site and the resources available to its residents (*28*).

Archaeological Resource Inventories and Portals

Several states have computerized archaeological resource inventories (*13*). For example, the Ohio DOT, working with the Ohio SHPO, developed a GIS program based on the National Park Service's MAPIT (Mapping and Preservation Information Technology) software. The Ohio database includes more than 120,000 cultural resources, including archaeological sites. The DOT funded the development of this GIS. The database allows DOT staff to electronically plot archaeological site locations and make early evaluations of potential impacts from proposed transportation project alignments. The GIS has become a valuable project planning tool and is used for the analysis of alternatives within the NEPA process (*4*).

Florida DOT's Efficient Transportation Decision-Making (ETDM) process

> links land use, transportation, and environmental resource planning and facilitates early interactive involvement to produce better and more consensual environmental outcomes. Through electronic data sharing and comment entry, maps can be viewed and comments filed and read by others on-line at various stages in the process (*4*).

ETDM includes an interactive, user-friendly GIS database that is accessed through the Internet. The ETDM database contains all of the state's computerized archaeological resource data, in addition to a wide range of environmental and land use data. Through the use of ETDM, the Florida DOT can identify potential impacts to archaeological resources and develop management strategies during the transportation planning process and during the early phases of project development. All management decisions are documented electronically and can be accessed by transportation and resource agencies involved in the Section 106 process, facilitating concurrent agency reviews and approvals. Agencies also use the system to exchange information (*4,13*). The Florida DOT noted that the Seminole Tribe of Florida is currently participating in the ETDM process. The DOT is working with several other tribes about participating in the ETDM process.

One area where IT tools have become very important to DOTs is in the recordation and management of archaeological sites located in DOT ROWs. The Oregon DOT has a GIS mapping program that locates archaeological sites within its ROWs. The GIS also indicates areas of high archaeological

resource potential. These locations are indicated on highway maps used by maintenance crews, and the GIS program informs maintenance when it needs to coordinate with archaeology staff to ensure that no sites will be affected by its activities. The Wisconsin DOT also has an archaeological database for ROWs in three of its state districts. The database records the National Register status of archaeological sites and indicates site locations that have not been evaluated. The database is used by the DOT's real estate, utilities, and maintenance offices. It is also used to a lesser extent by planning and design offices. Caltrans has a Transportation Enhancement grant to identify known archaeological sites within its ROW, to carry out surveys to identify new sites in the ROW, and to develop a GIS database on these archaeological resources.

The Arizona DOT has developed an internal web-based portal for the storage and retrieval of electronic cultural resource survey data. All CRM-related survey documents (including consultation letters) produced since 1985 have been scanned and entered into the portal. Cultural resource survey data can be retrieved either though a text search engine or through a GIS interface. The GIS also includes the locations of historic properties, including archaeological sites. Portal users can upload new information and add to existing information in the database. With this system in place the Arizona DOT has improved the efficiency of project planning and design by providing immediate access to CRM data using computers in the DOT's offices (S. Lane, personal communication, 2004).

PREDICTIVE MODELING (NONCOMPUTERIZED)

Some states that have not developed computerized archaeological predictive models use environmentally based correlation models to assist in project planning. The Ohio DOT has developed five archaeological predictive models for five physiographic regions of the state, providing a baseline to evaluate archaeological survey and site evaluation needs for projects. Once developed, the models are tested and refined through subsequent survey projects in the regions covered by the models. The results of these surveys are incorporated into the DOT's and SHPO's GIS database management systems.

The Ohio models are based on the analysis of data from previous archaeological studies and environmental research. The DOT creates two tables to convey the expected correlations between site occurrence and environmental setting within a region. The first table predicts which site types will be found in certain settings and the potential National Register eligibility of those sites. The second table outlines the estimated information yields and recommended investigation strategies for sites, given the environmental setting. Using these tables, the DOT outlines where sites are likely to be found in a project area and defines the strategies for future archaeological investigations in these areas (*29*).

GEOARCHAEOLOGICAL INVESTIGATIONS AS PLANNING TOOL

Several state DOTs are using geoarchaeology as a tool for assessing the presence and physical integrity of buried archaeological sites within proposed project areas. Geoarchaeology links archaeological methods with the concepts and methods of earth sciences, such as geology, pedology (i.e., the study of soils), and sedimentology (i.e., the study of sediments and sedimentation processes). TxDOT, for example, has developed a unique archaeological GIS database and predictive model based on geoarchaeological data. This database, which focuses on the Houston area, is referred to as the Potential Archeological Liability Map (PALM). The database was created with input from the Texas SHPO and outside peer reviewers. The database does not predict where archaeological sites will occur, but instead estimates the likelihood of encountering sites within a project's area of potential effects that will be eligible for listing on the National Register. PALM provides a visual representation of "geoarcheological potential." Geoarcheological potential refers to the probability of archaeological sites having enough integrity to make them eligible for the NRHP. The geological conditions of an area reflect its natural formation processes, which in turn affect the integrity of archaeological contexts. By assessing integrity, based on the geological environment, the DOT can estimate the chances of encountering an eligible archaeological site without conducting fieldwork. This program serves as an effective tool for evaluating the impacts of project alternatives on significant archaeological resources (*30*).

In Wyoming, the Department of Energy, state Bureau of Land Management, SHPO, Western Wyoming College, and a geoarchaeological consultant are developing a predictive model to assess the probability of encountering buried archaeological site locations. This is being done to improve and streamline environmental compliance and review for oil and gas exploration. The Wyoming DOT is providing technical reviews for the model development. The DOT plans to use the results of this project as a transportation planning tool. The resulting model will be posted on the Internet on a website maintained by the SHPO.

The Minnesota DOT is conducting a "Deep Testing Protocol" project to develop a set of statewide standards for field methods, reporting, and preliminary site evaluations. The project includes geomorphological and archaeological research and analyses and field testing. An important goal of this project is to define the most effective geoarchaeological field methods for each of the state's environmental settings. Once the project is completed, the DOT, SHPO, and state archaeologist will develop an agreement on the implementation of the selected protocols for future archaeological investigations.

ARCHAEOLOGICAL RESOURCE SYNTHESES

A few DOTs are creating syntheses to assist in evaluating and managing problematic types of archaeological resources. Some site types are problematic because they cannot be easily associated with a particular time period or culture; others are so numerous that they are encountered in high frequencies in almost every transportation project. The purpose of these syntheses is to establish a framework for determining the National Register eligibility of these sites and to develop guidance for their treatment if they are affected by DOT projects.

The Nevada DOT, in consultation with the SHPO, has developed syntheses for several types of archaeological resources in different parts of the state. A synthesis of information on rock circle sites in Nevada and surrounding states allowed the DOT to identify categories of this site type for which a lot of data had already been collected, and categories that were not well understood. This information guides investigations and National Register evaluations for this site type. The Nevada rock circle synthesis included a literature review, compilation of an annotated bibliography, construction of a database, and plotting of rock circle sites on U.S. Geological Survey topographic maps. The synthesis report contained written descriptions and photographs of rock circle features to aid future identification efforts. The report also included a recordation form for this site type so that future documentation would be standardized (*31*).

The Nevada syntheses, including the one for the rock circle sites, were funded through project-specific programs. When a National Register eligible site was going to be affected by a project, the DOT examined the expected scientific contributions and public benefit if the site was to be excavated through a data recovery program. If the data recovery would not result in a valuable contribution, funds that would have been used for the data recovery were applied to a synthesis for that category of site.

SUMMARY

PAs, APM, and computerized inventories and GIS databases are the most common tools used by DOTs, FHWA, and SHPOs to streamline and enhance archaeological investigations. PAs, in particular, are viewed as one of the best tools for streamlining the Section 106 process (*16*). Use of these agreements reduces project costs and review time; allows greater flexibility in Section 106 compliance; focuses Section 106 compliance on substantive issues and site types; and results in predictable project and preservation outcomes. It should be noted, however, that creating and maintaining these agreements takes both time and a strong commitment from agency staff, including upper management. The Vermont delegation agreement, for example, took several years to develop and the how to manual for implementing the agreement took an additional year (*16*).

Although several DOTs employ some form of predictive modeling as a planning tool, there has been no consistent approach to the creation, use, and maintenance of these models, which is also the case for modeling efforts among DoD installations. In addition, at times these models do not operate as originally expected. The Minnesota SHPO archaeologist, for example, noted that neither the SHPO nor the DOT exclusively relies on the Mn/Model to determine where archaeological surveys should or should not be conducted. It was determined that if the model was exclusively relied on, more surveys would be required than those suggested by experience-based judgmental models.

One of the goals of this synthesis study was to identify future research needs for improving the management of archaeological investigations. The survey questionnaires asked respondents to list the types of tools and research they would like to see in the future. Interestingly, the majority of the DOTs' responses focused on pre-project planning. Several called for the development of historic contexts. The Pennsylvania FHWA division office, for example, would like to see a historic context on lithic scatters. FHWA is considering a 2-year study to develop a historic context for this site type. Context development would involve testing and analyzing a sample of these sites across the state. The goal of this effort would be to address issues of eligibility and to define standard treatment plans.

Several DOTs identified the need for historic contexts on lithic scatters. The DOTs also recommended the development of historic contexts for 19th-century farmstead sites and 20th-century archaeological sites. If state DOTs fund the creation of historic contexts, the Nevada DOT cautioned, they must ensure that the resulting historic contexts are linked to transportation project and development needs rather than serving academic research needs.

Additional areas of research and study recommended by the DOTs included improving access to archaeological information, data, and documentation through a web-based repository or clearinghouse. They also recommended that the repository include information from neighboring states. PennDOT recommended that the creation of a repository or clearinghouse include breaking out important components of project reports and organizing these components into useful units that are easily accessible.

SHPO respondents echoed many of the DOTs' recommendations. These included the call for regularly updated historic contexts and regional syntheses. The Pennsylvania SHPO commented that the professionals developing historic contexts must be in touch with the realities of cultural resource management. As noted earlier, the Nevada DOT had the same concern. Other SHPO recommendations included greater use of geophysical investigations during identification and evaluation phases, development of statewide archaeological predictive models, continual updating of computerized

site locational models, and publication of an ACHP annual report on the past year's best practices.

SHPO and DOT calls for creating historic contexts mirror the recommendations of the 1999 National Forum on Assessing Historic Significance for Transportation Programs, sponsored by TRB. One of the top three recommendations was the need to develop regional and statewide historic contexts of mutual benefit to transportation agencies, SHPOs, tribes, and other interested agencies (*3*). Similar recommendations came out of TRB's 1996 Environmental Research Needs Conference. One of the research needs identified during the conference, the need to improve existing procedures for evaluating cultural resource significance, became a research project funded in 2000 through TRB and NCHRP (*3,12*). This research project, completed in 2002, examined how DOTs, FHWA, and SHPOs use historic contexts, and provided recommendations on how historic context use can be improved and expanded through IT applications (*12*).

The development of historic contexts continues to be a critical issue. At the 2004 historic preservation and transportation conference held in Santa Fe (discussed in chapter one), conference participants identified several action items. One was to re-energize agencies and communities to develop and appropriately use historic contexts (see Appendix C).

CHAPTER FIVE

INNOVATIVE APPROACHES TO STEPS IN SECTION 106 PROCESS

In addition to employing innovative approaches to preproject planning, several DOTs apply project-specific practices that enhance and streamline archaeological investigations and project review. These practices are applied to several stages of the Section 106 process—identification, National Register evaluations, and resolution of adverse effects.

IDENTIFICATION

Among the responding DOTs only one innovative method was discussed, that in their view enhanced the identification and evaluation of archaeological resources: remote sensing/geophysical studies. The Alabama DOT, for example, conducts remote sensing during the early stages of site evaluations. The goal of these studies is to locate signatures of potential burials, especially on historic period Native American sites. The resulting information is used to plan subsequent work. The DOT has found that methods such as ground penetrating radar (GPR) work well on such sites. The DOT is also contracting with the University of Mississippi to conduct a suite of remote sensing tests for DOT projects. The university is very well known for its geophysical and archaeological work, and the Alabama DOT expects that contracting with the university will both expand the use and efficacy of these remote sensing methods on transportation projects and enhance the DOT's credibility in the eyes of the SHPO.

Caltrans has in-house remote sensing capabilities; although the use of remote sensing is still in the experimental stages and the agency is evaluating which types of geophysical methods work best within different environmental settings and conditions. When remote sensing is used early in a project, it is anticipated that the DOT will be able to better target locations for subsequent work. The agency also plans to test the utility of remote sensing for reducing subsurface excavations during site evaluations and identifying internal site patterning without extensive subsurface testing. The Oregon DOT is also testing the efficacy of various geophysical methods in different regional contexts. For example, the DOT is conducting GPR surveys of known house pit sites to identify the signature of these subsurface features. This information will be used to identify these features during future surveys.

Cultural Resource Analysts, Inc. (CRAI), a CRM firm located in Lexington, Kentucky, routinely employs geophysical survey methods and is working with the Kentucky Transportation Cabinet (the state DOT) to demonstrate the value of these methods on transportation projects. CRAI has successfully used conductivity surveys to locate buried structures and features on historic period archaeological sites. They have also used this method, along with a site magnetic susceptibility study, to locate and define subsurface structures on complex Mississippian village sites (*32*).

NATIONAL REGISTER EVALUATIONS

In his response to the survey questionnaire, the Minnesota SHPO archaeologist raised concerns about the value and adequacy of archaeological mitigation projects. Based on a preliminary study of major mitigation projects undertaken in the state during the 1990s, he found that the majority of these projects failed to fulfill most of the objectives listed in the projects' research designs. The reasons for this problem were (1) inadequate assessments of research potential during the site testing/evaluation phase, and (2) a lack of understanding of what National Register criterion D really means. The Minnesota SHPO recommended that states carefully evaluate previous archaeological investigations to learn from past work and improve future site evaluation efforts.

The Montana DOT has implemented a new approach for dealing with one of the state's problematic archaeological sites—tipi rings. The agency noted that the technique for evaluating these sites has not changed over the past 30 years. On one occasion, in consultation with the SHPO, the DOT spent additional time and money to more fully test a tipi ring site than had been done in the past. The entire ring was excavated in a detailed study to determine whether anything was present that had research value. The DOT may do this a few more times, focusing on single tipi rings, to learn more about these types of sites. It is hoped that the results of this work will aid in future National Register evaluations of these types of sites and streamline future projects.

The Kentucky FHWA division office noted that most evaluation studies, which use standard test excavations, resulted in findings that sites were not National Register eligible. Given the consistency of these findings, the FHWA felt that less costly site evaluation methods should be employed. Such approaches might include better sampling techniques and use of available information. The Kentucky Transportation Cabinet noted that as a result of discussions among

FHWA, SHPO, and DOT on these issues, it is updating the state's preservation plan in terms of archaeology. The state DOT will synthesize and analyze information collected to date to determine (1) what knowledge has been gained as a result of past archaeological studies, (2) which research questions have been adequately addressed, (3) which research issues have not been addressed, (4) what new and important research issues require study, and (5) what are the gaps in knowledge concerning the state's prehistory.

RESOLUTION OF ADVERSE EFFECTS

Data Recovery Research Designs

Several DOTs discussed how they have improved implementation of archaeological data recovery projects. The approaches used include the use of phased or stepped research designs and peer review of data recovery plans. The Alabama DOT, for example, has implemented a stepped data recovery program for some projects. When there is some doubt about the potential of a site to yield data, the DOT sets up a stepped review process as part of the initial research design, holding periodic reviews and meetings with the SHPO and archaeological consultant throughout the data recovery effort. If work at a site does not provide the important information that was originally expected, it may end the fieldwork or alter the field strategy.

The Delaware DOT also stages its data recovery. The DOT, SHPO, CRM consultant, and consulting parties meet and evaluate the direction of the data recovery at each stage of the project (fieldwork, laboratory analysis, reporting, etc.) and determine whether or not work should continue and, if so, how. To make this operational in terms of consultant contracting, the DOT does not include full artifact analyses in the original data recovery budget. The original budget only includes preliminary examination of artifacts. A more complete budget is developed after the fieldwork is finished. The same procedure is followed for report preparation. The DOT, in consultation with the other parties and the consultant, establishes a report budget after the fieldwork and preliminary artifact analysis are complete. The DOT uses work orders or agreements to handle these changes or continuations in work. This approach has resulted in better project outcomes and cost savings.

The Wisconsin DOT uses an advisory committee consisting of representatives from the agencies' CRM contractors to review data recovery plans before the plans go to the SHPO for review. Committee members do not review their own plans, and the reviewers only make recommendations to the DOT. The purpose of this committee is to get the best and most cost-effective plans possible. Members of this committee, which at this time had been in place for 4 years, are all volunteers. The agency also invites tribes that are consulting parties for a project to review the data recovery plans. To date, when a plan reviewed by the committee goes to the SHPO, it is usually approved quickly and easily. The Utah DOT has a similar advisory committee, but the committee also reviews National Register eligibility evaluations and effects determinations before they are submitted to the SHPO for review. The DOT submits eligibility and effects findings to the committee when a project might have an adverse effect on a site.

Creative Mitigation

Archaeological data recovery is the standard approach to resolving adverse effects on archaeological sites. The survey responses suggest, however, that DOTs and FHWA division offices are beginning to turn to alternative and nonstandard ways to resolve adverse effects. These approaches are generally referred to as "creative mitigation." Creative mitigation was the most frequently identified practice of all of the innovative approaches used to improve the steps in the Section 106 process.

PennDOT, in consultation with FHWA and Section 106 parties, has used creative mitigation on projects involving "sliver takes." These types of projects would have required deep testing in tight places (generally in floodplains and involving bridge replacements), where safety requirements greatly inflated the cost of the archaeological data recovery. For sliver takes, the DOT often found that the data recoveries would be costly, yet yield little important new information given the constraints of the small project area. In addition, it is difficult to interpret the results of such data recoveries as it is often unclear how the small excavated area represents or relates to the remainder of the site, which extends outside the project limits. Therefore, the DOT has proposed and implemented some creative options. Rather than doing data recovery, the agency has, for example, funded syntheses of the archaeology of the area, developing a historic context based on previous studies to serve as the foundation for future National Register evaluations. On the City Island project near Harrisburg, PennDOT used the monies that would have gone to a data recovery associated with a sliver take to develop lesson plans for schools on the prehistory of the island. In another example, the agency used the money to purchase a preservation easement for the portions of a site outside of the sliver take, thus preserving most of the site. Although these approaches may save a little money, the DOT adopted them because of the improved preservation outcome and public benefit.

The Georgia DOT has used creative mitigation when information from a data recovery project involving certain types of National Register eligible sites (e.g., sand dune sites) would neither contribute new important knowledge about these sites nor assist in subsequent evaluations of these site types. In such cases, instead of conducting a comprehensive, detailed data recovery, the agency directs some of the data recovery monies toward developing a historic

context or producing educational brochures. These products are intended to provide information on how to deal with this site type in the future and educate the public. The DOT still samples the site to be affected by the project as part of the mitigation. Creative mitigation is also used on projects where proposed ROWs affect only a small portion of a site. In these cases, the agency does some traditional data recovery of the site in addition to developing a context for the type of site being affected.

The Alabama DOT is developing a PA to establish a creative mitigation process for dealing with submerged archaeological sites. The DOT is currently reviewing previously recorded sites that have been submerged for several years by past Tennessee Valley Authority projects. Given the extremely high cost and complex logistics associated with testing inundated sites, the PA calls for the DOT to pay for the analysis of existing collections that were excavated before the creation of the Tennessee Valley Authority lakes, as opposed to conducting archaeological investigations of these submerged sites. In some cases, these collections date back to the days of the Works Progress Administration. The impetus for the PA was the presence of a recorded, inundated shell midden site within a DOT project area. The PA only involves sites that do not have the potential to contain human remains.

The Alabama DOT, in consultation with the SHPO and FHWA, is also looking into ways to improve the National Register evaluations of sites for which no archaeological or historic contexts currently exist. One approach involves using data recovery funds (or portions of funds) to conduct surveys of the drainages where these sites are located. The purpose of these surveys is to develop predictive models and historic contexts, defining settlement patterns and site types within the drainages. These contexts also identify the research potential and value of the various site types within a given drainage.

TxDOT has funded the development of general archaeological research themes, resource evaluation methodologies, historic contexts, etc., as part of data recovery deliverables. These funds are added onto the general cost for data recoveries. One example was the development of a protocol for dealing with burned rock middens. The Nevada DOT has also taken this approach. The rock circle synthesis discussed in chapter two was developed using funds from data recovery projects. The Nevada DOT is also working with experts in the state to develop lithic sourcing data and is funding the chemical analyses required to source these materials. This research is done in the context of Section 106 compliance for specific projects, where the DOT directs project monies into this type of study. These studies demonstrate the agencies' commitment to the archaeology of the state, and enhance its credibility in the eyes of the SHPO and federal land managing agencies. These studies also help in the evaluation and interpretation of archaeological resources encountered on DOT projects.

The Montana DOT has worked closely with some tribes in the state to employ nontraditional approaches to archaeological data recovery. For example, on one project the Confederated Salish and Kootenai Tribes reported that a group of sites were eligible for the National Register, but that these sites were marginal in the view of the DOT. Because the tribe expressed interest in the sites, the agency approved limited standard data recovery on the sites, and then took the balance of the money that would have been required for a more comprehensive data recovery and funded an oral history project for the tribe to research and record place names in the area of the sites. This project resulted in a product that met the concerns of the tribe and the compliance needs of the DOT.

Some DOTs have purchased significant archaeological sites as a form of mitigation. The Wisconsin DOT purchased the privately owned portion of a burial mound located both inside and outside of its ROW. This mitigation plan protected the mound from future impacts. The DOT took a similar approach to a burial site located in a proposed project corridor. In this case, the DOT changed the project design to avoid the burial site, but ensured its preservation by purchasing the site, which was located on private property and adjacent to the ROW. The agency used project funds to make these purchases. The Arkansas DOT has also purchased sites that extended outside project ROWs. In one case, the DOT purchased and now owns two sites located in agricultural fields and incorporated the sites into a wetland mitigation area associated with the project. This removed the sites from impacts resulting from continuous cultivation.

The Georgia DOT assumed stewardship responsibility for a Civil War era battery located in a wetland mitigation site for a widening project. The DOT hired Southeastern Archeological Services to assess the integrity of the site and develop a preservation and stabilization plan. After consulting with the National Park Service and the National Clearinghouse for Archaeological Site Stabilization at the University of Mississippi, the DOT and Southeastern Archaeological Services determined that the best course of action to maintain and stabilize the site would be a pro-active but passive approach of annual monitoring and revegetation with native plant species. The DOT will administer the plan with assistance from National Park Service staff at Fort Pulaski National Monument in Chatham County, Georgia, and from the Georgia Department of Natural Resources Law Enforcement (*33,34*).

SUMMARY

DOTs, SHPOs, and CRM firms expressed a general enthusiasm for geophysical technology. Geophysical techniques are viewed as cost-effective ways of improving archaeological resource identification and evaluation efforts and, because they are nondestructive, they are appropriate for properties about which tribes have cultural or religious concerns. Respondents noted, however, that the use of different

geophysical methods is still considered to be experimental. As a result, some DOTs are testing the efficacy of geophysical investigations in the context of different environmental settings and site types. In terms of future research needs, the Oregon DOT recommended a study on GPR. The study might, for example, involve the application of GPR to different site types across the state, providing a baseline for future use of GPR during archaeological surveys and site evaluations. This type of study could reduce the time and cost for future projects in which these types of sites were encountered. Most importantly, this is a noninvasive approach to archaeological investigations. The state's tribes are supportive of this type of work.

Several DOTs also supported creative approaches that deal with marginally eligible sites or sites for which no historic context exists. A number of states have turned the challenge of dealing with these types of sites into opportunities for creative mitigation measures. By dealing expeditiously (or not at all) with marginal sites and sliver takes of more significant sites, a number of DOTs have found a way to fund historic context development and other studies that are needed for better evaluation and management of archaeological sites that will be affected by transportation projects. Other creative mitigation efforts used by DOTs include the development of resource syntheses as part of data recovery efforts and the purchase of significant archaeological sites within and outside DOT project ROWs.

In terms of additional suggestions for future studies, the Nevada DOT and the Arizona FHWA division office identified the need for a nationwide study on the use of site burial as a form of mitigation. This study would examine, on a regional basis, when and how site burials can be used given different types of soils and geomorphological environments, and different types of sites. The results of this research would be made operational through a nationwide programmatic agreement on when it is appropriate to bury sites and when it is not. The New Mexico DOT recommended that FHWA fund a study on the benefits of using creative mitigation.

CHAPTER SIX

OBSTACLES TO IMPLEMENTING INNOVATIVE AND EFFECTIVE APPROACHES TO ARCHAEOLOGICAL INVESTIGATIONS

Survey respondents noted that one of the main obstacles to the use of new, innovative approaches to archaeological investigations is a lack of funds. Several of the respondents reported that as a result of this constraint they were not able to

- Develop historic contexts;
- Improve tribal consultation, which often requires meeting tribes outside the state or paying for tribes to travel to meetings and conferences (this is especially difficult given current state government restrictions on travel); and
- Conduct research on new field and analytical methods, such as remote sensing.

Some DOTs and FHWA division offices identified their SHPO's reluctance to concur with nonstandard approaches as a stumbling block to creativity in managing archaeological investigations. The DOTs also noted that the culture of their own agencies constrained the use of innovative and effective practices. Their colleagues and managers often take the attitude that we have always done it this way, so why do we need to change and try something new? DOT staff is sometimes too focused on day-to-day Section 106 compliance activities and therefore are not open to approaches that move beyond the standard compliance process. Making changes to existing agency procedures and processes is given a low priority. One DOT noted that from time to time their CRM consultants are resistant to innovative approaches. These approaches often do not conform to the types of things that their contractors are interested in or want to do. One SHPO noted that the biggest constraint to implementing innovative practices was a lack of talented, capable archaeological consultants to work with FHWA and the DOT, as well as inadequate project funding and restricted project schedules.

Another constraint is DOT staff turnover. The North Carolina DOT noted that it was experiencing a high turnover in environmental and engineering staff, and that incoming staff are not familiar with the requirements for archaeology and how it is done in the department. As a result, there is a need to continually train new staff to keep existing effective practices moving forward. This is very important to maintain trust with other agencies, such as the SHPO.

Another constraint results from the use of an innovative approach that does not work well. In such cases, the event should be used as a lesson to improve how the practice is applied in the future, not a reason for abandoning the practice. For example, the Oregon DOT had a situation where a flexible data recovery design contained unclear wording that lead to contentious and open-ended discussions about when the data recovery plan was fulfilled. This caused conflicts with the CRM contracting firm, the municipality where the project took place, the DOT, the SHPO, and the tribes who were consulted about the project. Ultimately, these issues were resolved, but it was a long process and one that could have been handled much more effectively if the data recovery plan and anticipated project impacts had been more fully defined at the initiation of the work. The DOT noted that data recovery plans must always allow some flexibility, but that they can become a source of contention when the objectives of the data recovery are not clearly delineated and included in the data recovery plan and associated Section 106 agreement.

Ways identified to address these types of obstacles are similar to the practices that improve and maintain good communication among the Section 106 parties. As demonstrated by the many examples discussed in the previous chapters, the following practices counter, or at least soften, resistance to innovation and change:

- Having regular meetings that review ongoing and future projects and programs;
- Participating in collaborative efforts;
- Establishing joint agency objectives, goals, and processes; and
- Having upper management support and directives to implement and maintain effective, innovative practices.

The Oklahoma DOT noted that it is helpful to work slowly rather than propose major changes all at once. Internal proposals for innovative practices are best received by upper management when it can be determined that, in addition to benefiting the goals of historic preservation or being required by the "letter of the law," they would effectively address identified DOT needs in terms of quicker project delivery or maintaining smooth relationships with the SHPO and other state regulatory agencies. When such processes are already working well, upper management is generally unlikely to support large-scale innovation solely because it better serves historic preservation goals or is perceived as a best practice by historic preservation professionals.

CHAPTER SEVEN

CONCLUSIONS

Several common themes can be identified in the responses from state departments of transportation (DOTs), FHWA, state historic preservation offices (SHPOs), tribes, and cultural resource management firms. First, discussions and consultations held outside of the requirements of individual projects are an effective means of building trust and communication. This is especially the case with tribal consultation, where general discussions on protocols and important issues are best held without the constraints and potential conflicts inherent in specific transportation projects. The FHWA, DOTs, and tribes often formalize these protocols in programmatic agreements and memoranda of understanding.

These pre-planning and nonproject-specific discussions, however, take time and a commitment from all parties involved. They also require activities that are not linked to specific projects. It is often difficult for agency staff to participate in nonproject-specific activities given scheduling constraints and agency priorities. However, DOT, SHPO, FHWA, and tribal representative responses to the survey demonstrate the long-term benefits of these nonproject-specific communication efforts.

A second theme is the usefulness of programmatic agreements (PAs) as opposed to case-by-case approaches. This theme appeared throughout the responses, but especially in reference to productive approaches to coordinating Section 106 compliance with the National Environmental Policy Act (NEPA) process. Use of these agreements reduces project costs and review time, allows greater flexibility in Section 106 compliance, focuses Section 106 compliance on substantive issues and site types, and results in predictable project and preservation outcomes. It should be noted, however, that creating and maintaining these agreements takes both time and a strong commitment from agency staff, including upper management.

The third theme was a general enthusiasm for using technology as a planning tool. Information technology and predictive modeling, for example, are viewed as cost-effective ways to evaluate alternatives for transportation projects and to target survey and testing dollars on the areas where they will yield the most important information. Geophysical techniques are cost-effective ways of improving archaeological resource identification and evaluation efforts and, because they are nondestructive, they are appropriate for properties about which tribes have cultural or religious concerns. Survey respondents, however, considered several geophysical methods to still be experimental. As a result, some DOTs are testing the efficacy of geophysical investigations in the context of different environmental settings and site types. Although several DOTs and other agencies employ some form of predictive modeling as a planning tool, there has been no consistent approach to the creation, use, and maintenance of these models. Such models may not operate as originally expected and they are supplemented with judgmental criteria to increase their accuracy, thereby reducing their systematic and objective character.

The final theme has to do with marginally eligible sites and sites for which no historic context exists. A number of the states surveyed have turned the challenge of dealing with these types of sites into opportunities for creative mitigation measures. By dealing expeditiously (or not at all) with these sites and "sliver takes" of clearly significant sites, a number of DOTs have found a way to fund historic contexts and other studies that are needed for better evaluation and management of archaeological sites that will be affected by transportation projects.

The effective practices discussed in this report can also be grouped into four broad categories:

1. Communication (includes tribal consultation and engaging the public),
2. Internal business practices and the project delivery process,
3. Pre-project planning, and
4. Innovative approaches to the steps in the Section 106 process.

Some practices establish opportunities for regular and continuous communication; therefore, project issues and concerns can be dealt with quickly. This results in increased trust and cooperation among agencies and with the public and tribes. Other practices, especially those under the category of pre-project planning, provide a clear framework for conducting archaeological investigations and complying with the requirements of Section 106. As a result, project activities are predictable and project outcomes are known

early in the project development and regulatory compliance processes. These practices focus on outcomes and not rote implementation of processes.

In general, these practices are used uniformly across the country (see Appendix D). There are, however, some regional preferences. None of the western states responding to the survey (i.e., Colorado, Montana, New Mexico, Wyoming, and all states to the west of these states) use archeological predictive modeling or phased approaches to archaeological surveys. The survey responses do not provide an explicit reason for these regional differences. It can be inferred, however, that phasing and predictive models are used in eastern states because of the difficulty of locating archaeological sites in the agricultural and forested lands common to this area. In the west, sites are generally visible on the surface. In eastern states, these two practices reduce the time and cost of evaluating the impacts of project alternatives on archaeological resources.

One of the goals of this synthesis study was to examine how DOTs and FHWA quantify the benefits of innovative, effective practices. The questionnaires for DOTs and FHWA asked if they had quantified the benefits of implementing these practices and, if so, what measures they used—cost, timeliness of project delivery, number of sites avoided, or other factors. Unfortunately, very few states collect this type of information.

The Texas DOT reported that it has been able to keep historic preservation compliance costs down as a result of implementing various innovative practices over the previous 5 years. It noted that the cultural resource management office budget had doubled over that period, whereas the DOT's overall construction budget had increased fourfold. The Illinois DOT stated that their statewide archaeological survey budget had not increased in the previous 5 years. This budget includes all of their "run-of-the-mill" inventory and survey projects and some National Register eligibility testing efforts. The DOT keeps finding better and more efficient ways of doing its historic preservation compliance work, using such tools as programmatic agreements, smarter artifact collection strategies, and surveys that are postponed until they are really needed during the NEPA and project design process.

The Oregon DOT noted that in its state, nontraditional approaches are seen as ways to reduce project cost and improve project delivery, even when initial start-up costs appear to be substantial. These initial costs are viewed as appropriate, given the long-term benefits of these practices. The Wisconsin DOT noted that all of these efforts and approaches pay off by reducing future costs. Furthermore, many of these approaches are low cost, given that they predominantly deal with improving and enhancing communication among parties.

Some states are beginning to quantify the results of using innovative approaches. The Georgia DOT, for example, is starting to collect this type of information in response to FHWA's "Vital Few" initiative and a directive from upper management within the department. Both the DOT and FHWA want to demonstrate a reduction in adverse effects per project mile as a measure of the effectiveness of the state's streamlining efforts.

Another goal of this synthesis study is to identify future research needs for improving the management of archaeological investigations. The survey questionnaires asked respondents to list the types of studies or research that they felt were important. As noted in chapter four, the majority of the responses focused on pre-project planning. The respondents identified the need for:

- Historic contexts, especially for problematic sites such as lithic scatters, 19th-century farmstead, and 20th-century archaeological sites.
- Protocols for geophysical investigations and deep testing for buried archaeological sites.
- A repository or clearinghouse for archaeological information, data, and documentation, which should be web-based.
- A nationwide study on the use of site burial as a form of mitigation.

The last item listed requires an initiative that is beyond the capabilities of a single state DOT, as would the creation of a national archaeological data/document repository. The effective practices described in this report, however, can be used to create needed state historic contexts, testing protocols, and state-specific repositories or clearinghouses.

Several DOTs, such as those in Georgia, Nevada, Pennsylvania, and Texas, have addressed the need for historic contexts by using creative mitigation to fund and develop contexts, syntheses of archaeological work in a given area, and studies of specific categories of sites. As for state-specific repositories of archaeological information and documentation, Arizona has developed an internal web-based portal for the storage and retrieval of electronic cultural resource survey data and documentation. Florida DOT's Geographic Information System/Internet-based Efficient Transportation Decision Making process not only serves as a repository for cultural resource data, but also provides an electronic platform for decision making and information exchange among agencies. The creation of these types of information management systems, as well as computerized site inventories, requires funds outside of the project development process. Funding sources for creating and maintaining these state-focused information technology tools and systems include Transportation Enhancement funds, FHWA streamlining project funds, and other special funding sources.

Additional research needs identified during this synthesis study include:

- Synthesizing and evaluating past archaeological investigations to better define significant archaeological resources, and to identify the most effective methods for managing such resources.
- Evaluating the public benefit of archaeological investigations.
- Determining whether centralized versus decentralized state DOT programs impact the effectiveness of these streamlining and stewardship efforts.
- Evaluating the effectiveness of agency-generated manuals, guidance, and training.
- Quantifying the benefits of innovative, effective practices.

As noted in chapter one, transportation and historic preservation professionals repeatedly call for better integration of historic preservation compliance and transportation project delivery. Those interviewed for this synthesis identified the following actions that would improve integration and project outcomes:

- Better access to, analysis of, and use of cultural resource data for making sound transportation decisions.
- Early and more efficient coordination among all parties involved in all stages and components of transportation programs.
- Early and more efficient coordination and integration of overlapping and at times conflicting regulatory and compliance procedures (i.e., Section 106 and NEPA).
- Contextual information for evaluating resource significance, determining what the "context" is in context-sensitive solutions, and defining and meeting local and regional historic preservation goals, plans, purpose, and needs.
- Constructive public input in the creation and use of this contextual information (tribal and minority communities in particular need to be partners in this effort).
- Direct and tangible public benefit from historic preservation actions.

This NCHRP synthesis study demonstrates that several state DOTs, state FHWA division offices, SHPOs, and tribes are effectively implementing these and related actions. Although the survey findings suggest that it is somewhat difficult for agencies to quantify the benefits of these activities, the survey responses do highlight several qualitative measures of success. These include reducing or eliminating conflict among agencies, improving relations and trust between agencies and tribes, meeting project schedules and objectives, reducing public opposition to transportation projects, and producing tangible public benefits of transportation-funded archaeological investigations. These and other qualitative benefits are all desirable outcomes and justify the continued use and expansion of practices that streamline project delivery and improve stewardship of our nation's archaeological heritage.

REFERENCES

1. "Environmental Streamlining and NEPA: A History," Federal Highway Administration, Washington, D.C. [Online]. Available: http://environment.fhwa.dot.gov/strmlng/es3history.htm [2004, June 4].
2. "Environmental Streamlining, FHWA's Vital Few Environmental Goals," Federal Highway Administration, Washington, D.C. [Online]. Available: http://environment.fhwa.dot.gov/strmlng/vfovervw.htm [2004, June 5].
3. Klein, T. and M. Naber, "Cultural Resources," *Conference Proceedings 28: Environmental Research Needs in Transportation*, Transportation Research Board, National Research Council, Washington, D.C., 2002, pp. 55–63.
4. Environmental Streamlining, State Streamlining Practices, Federal Highway Administration, Washington, D.C. [Online]. Available: http://environment.fhwa.dot.gov/strmlng/es6stateprac.asp [2004, June 4].
5. Little, B.J., "Keeping Up with the Past: Updating Guidance for Archaeological Best Practices," *CRM*, Vol. 24, No. 7, 2001, pp. 21–24.
6. *Treatment of Archeological Properties: A Handbook*, Advisory Council on Historic Preservation, Washington, D.C., Nov. 1980.
7. *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*, 48 FR 44716, National Park Service, U.S. Department of the Interior, Washington, D.C., 1983.
8. Little, B., E.M. Seibert, J. Townsend, J.H. Sprinkle Jr., and J. Knoerl, *National Register Bulletin: Guidelines for Evaluating and Registering Archeological Properties*, History and Education, National Register, National Park Service, U.S. Department of the Interior, Washington, D.C., 2000.
9. Altschul, J.H., "Significance in American Cultural Resource Management: Lost in the Past," in *Heritage of Value, Archaeology of Renown: Reshaping Archaeological Assessment and Significance*, C. Mathers, T. Darvill, and B. Little, Eds., University Press of Florida, Gainesville, 2005, 339 pp.
10. King, T.F., *Thinking About Cultural Resource Management: Essays from the Edge*, AltaMira Press, Walnut Creek, Calif., 2002, 200 pp.
11. King, T.F., *Cultural Resource Laws and Practice: An Introductory Guide*, AltaMira Press, Walnut Creek, Calif., 1998, 256 pp.
12. Klein, T.H., "Archaeology and the Evaluation of Significance," in *Transportation Research Circular Number E-C055: National Forum on Assessing Historic Significance for Transportation Programs*, Transportation Research Board, National Research Council, Washington, D.C., 2003, pp. 27–33.
13. URS Corporation, *Review and Improvement of Existing Processes and Procedures for Evaluating Cultural Resource Significance*, Transportation Research Board, National Research Council, Washington, D.C., Feb. 2002.
14. "Working with Section 106—Section 106 Regulations Users Guide," Advisory Council on Historic Preservation, Washington, D.C. [Online]. Available: http://www.achp.gov/usersguide.html [2004, Sep. 27].
15. "NEPA Project Development—Environment and Planning—FHWA," Federal Highway Administration, Washington, D.C. [Online]. Available: http://environment.fhwa.dot.gov/projdev/index.htm [2004, Nov. 4].
16. "How Well Do We Work Together? Results from the Gallup Study," *Success in Streamlining, Monthly Newsletter*, May 2004 [Online]. Available: http://environment.fhwa.dot.gov/strmlng/newsletters/may04nl.htm [2004, June 4].
17. "Programmatic Agreement Tool Kit for State Departments of Transportation Environmental Projects and Program," American Association of State Highway and Transportation Officials, Center for Environmental Excellence, Washington, D.C. [Online] Available: http://www.environment.transportation.org/center_products_programs/programmatic_agreement_toolkit/index.html [2004, June 14].
18. "Tribal Consultation," American Association of State Highway and Transportation Officials, Center for Environmental Excellence, Washington, D.C. [Online]. Available: http://www.environment.transportation.org/environmental_issues/tribal_consultation/overview.htm [2004, June 18].
19. Lewis, A.H., Ed., *Highway to the Past: The Archaeology of Boston's Big Dig*, William Francis Galvin, Secretary of the Commonwealth, Chairman, Massachusetts Historical Commission, Boston, Mass., 2001.
20. Robinson, F.W., *An Introduction to Vermont Archaeology: Native American Archaeological Sites and the Chittenden County Circumferential Highway*, University of Vermont Consulting Archaeology, Burlington, 2003.
21. "Kids Dig Reed: Reed Farmstead Archaeological Site," West Virginia Department of Transportation, Charleston [Online]. Available: http://www.kidsdigreed.com [2004, June 14].
22. *Delegation of Federal Environmental Responsibilities for Highway Projects*, American Association of State Highway and Transportation Officials, Washington, D.C., 2002 [Online]. Available: http://environment.fhwa.dot.gov/strmlng/delreport.htm [2002, Aug. 8].
23. "Statewide Section 106 Programmatic Agreements: A Streamlining Initiative," Federal Highway Administration, Washington, D.C. [Online]. Available: http://environment.fhwa.dot.gov/histpres/section1.htm [2004, Nov. 1].

24. "The Archaeological Curation Crisis: An Integrated Action Plan for the SAA and Its Partners," Submitted by the Society for American Archaeology Advisory Committee on Curation to the Society for American Archaeology Board of Directors, Society for American Archaeology, Washington, D.C., Mar. 2003.
25. "The Vermont State Historic Preservation Office's Guidelines for Conducting Archaeology in Vermont: Working Draft," 2002 [Online]. Available: http://efotg.nrcs.usda.gov/references/public/VT/guidelines_for_conducting_arch.pdf [2004, June 21].
26. Hudak, G.J. and E. Hobbs, "Mn/Model: A Statewide Archaeological Predictive Model for Minnesota," Minnesota Department of Transportation, St. Paul, nd.
27. Environmental Services, Inc., *North Carolina Archaeological Predictive Modeling Project: Results of Task 1, Cabarrus, Chatham, Forsyth, Granville, Guilford, Randolph, and Wake Counties*, T.I.P. Number E-4602, North Carolina Department of Transportation, Sep. 2003.
28. Altschul, J.H., L. Sebastian, and K. Heidelberg, *Predictive Modeling in the Military: Similar Goals, Divergent Paths*, Preservation Research Series 1, SRI Foundation, Rio Rancho, N.M., 2004.
29. *A Preliminary Reconnaissance Survey of the Delaware Bend Area and an Assessment of Archaeological Resources Impacted by the DEF-CR134-2.414* (*PID 15741*) *Bridge Replacement Project in Delaware Township, Defiance County, Ohio*, Cultural Resources Unit, Bureau of Environmental Services, Ohio Department of Transportation, Columbus, Oct. 1997.
30. Abbot, J.T., *Houston Area Geoarcheology: A Framework for Archeological Investigation, Interpretation, and Cultural Resource Management in the Houston Highway District*, Report 27, Archeological Studies Program, Environmental Affairs Division, Texas Department of Transportation, Austin, 2001.
31. Blair, L.M. and M. Fuller-Murillo, *Rock Circles of Southern Nevada and Adjacent Portions of the Mohave Desert*, Cultural Resources Section, Environmental Services Division, Nevada Department of Transportation, Carson City, July 1997.
32. Clay, R.B., "The Place of Geophysical Survey in Contemporary Fieldwork," Cultural Resource Analysts, Inc., Lexington, Ky., 2004 [Online]. Available: http://www.crai-ky.com/services/geophysical/wheredow.html [2004, May 5].
33. Patch, S.M., E.A. Duff, R.M. Thorne, J.E. Ehrenhard, and C.O. Braley, *A Preservation and Stabilization Plan for Battery Hamilton* (*CH953*), Chatham County, Georgia, Georgia Department of Transportation, Atlanta, Apr. 29, 2003, 12 pp.
34. Braley, C.O., *Archeological and Historical Investigations at Battery Hamilton* (*9CH953*), Chatham County, Georgia, Georgia Department of Transportation, Atlanta, Jan. 15, 2003, 51 pp.

ACRONYMS

ACHP	Advisory Council on Historic Preservation
ACRA	American Cultural Resource Association
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CIT	Cultural Interchange Team
CRM	Cultural Resource Management
CSKT	Confederated Salish and Kootenai Tribes
DoD	Department of Defense
DOTs	departments of transportation
EA	Environmental Assessment
EBCI	Eastern Band of the Cherokee Indians
EIS	Environmental Impact Statement
FONSI	finding of no significant impact
GIS	Geographic Information Systems
GPR	ground penetrating radar
GRIC	Gila River Indian Community
HPO	historic preservation office (SHPOs and THPOs)
IT	information technology
MAPIT	Mapping and Preservation Information Technology
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPO	metropolitan planning office
NATHPO	National Association of Tribal Historic Preservation Officers
NCSHPO	National Conference of State Historic Preservation Officers
NEPA	National Environmental Policy Act
NGA	National Governors Association
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
OMB	Office of Management and Budget
PA	programmatic agreement
PALM	Potential Archeological Liability Map
ROD	Record of Decision
ROW	right-of-way
SCOE	Standing Committee on the Environment (AASHTO)
SHPOs	state historic preservation offices
TEA-21	Transportation Equity Act for the 21st Century
THPO	tribal historic preservation officers
USACE	U.S. Army Corps of Engineers
USET	United South and Eastern Tribes

APPENDIX A

Survey Questionnaires

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM
PROJECT 20-5, SYNTHESIS TOPIC 35-09
MANAGEMENT OF ARCHAEOLOGICAL INVESTIGATIONS

QUESTIONNAIRE FOR STATE DOTs AND FHWA

Innovative and Nontraditional Approaches to Archaeological Investigations

The following is a list of innovative and nontraditional tools, approaches, and procedures that have been used across the country to improve and enhance archaeological investigations in the context of Section 106 compliance.

- Programmatic approaches to Section 106 compliance (e.g., using Section 106 programmatic agreements to implement nontraditional approaches that deal with a category of projects or category of archaeological resources).
- Creative mitigation (e.g., "off-site mitigation," which includes analysis of existing collections, development of local or regional archaeological or historical syntheses, and writing of nontechnical reports, in lieu of or supplemental to site data recovery).
- Creative approaches to integrating tribal consultation into archaeological investigations and considering tribal cultural values in assessing significance of archaeological resources.
- Innovative public outreach and education (i.e., whereby public outreach is not simply an add-on to an investigation and goes beyond site tours, temporary exhibits, brochures, and public lectures).
- Remote sensing to identify archaeological resources.
- Geomorphological data used as a planning and National Register evaluation tool.
- Innovative and nontraditional artifact collection methods.
- Innovative approaches that address the growing curation problem.
- Flexible data recovery research designs.
- Flexibility in spatial or artifact sampling during site identification, evaluation, and data recovery.
- Geographic information systems (GIS) and other information technology used for developing archaeological predictive models.
- Archaeological predictive models used as a planning tool.
- Active use of historic contexts for archaeological resources.
- Prioritization of archaeological research goals.
- Guidance for defining what is "important" information in history or prehistory (i.e., National Register criterion D).
- Flexibility in contracting practices (e.g., cost-plus versus fixed-fee contracts, use of in-house staff as opposed to outsourcing, etc.).

There are other practices that also have an impact on the efficacy of archaeological resource investigations. These practices include:

- Building good relationships and trust among state departments of transportation (DOTs) and resource agencies, such as state historic preservation offices (SHPOs).
- Integrating the Section 106 process with the steps in the National Environmental Policy Act (NEPA) process (e.g., phasing archaeological investigations to mesh with timing of NEPA analyses, particularly for categorical exclusion-level projects).
- Integrating the Section 106 process with the steps in the project design process (e.g., determining appropriate level of effort for archaeological investigations during preliminary design, postponing site identification phases until final design, developing investigation strategies that mesh with design/build projects, etc.).
- Funding of project review positions within SHPOs.
- Training to improve the skills of both agency and consultant staffs.

1. Has your agency successfully used any of the above practices? If so, briefly describe how these practices were used and why they were successful. Are there other creative measures that you have developed that streamline the Section 106 process and enhance archaeological conservation efforts? Briefly describe these other measures.

2. What types of constraints have you encountered while implementing these types of practices? How did you overcome these constraints?

3. Has the use of any of these nontraditional approaches not been successful? Briefly describe why they were not successful.

4. Can you provide us with written summaries, articles, reports, or other documents that describe your use of these practices?

DECISION MAKING

5. Who within your agency makes the final decision on the scope of work for traditional archaeological investigations, including data recovery?

6. Who within your agency makes recommendations as to whether or not to use innovative and nontraditional approaches to archaeological resource investigations and Section 106 compliance? Who makes the final decision as to whether or not to use these nontraditional approaches?

7. In making these decisions on level of effort for archaeological investigations or to use nontraditional and innovative approaches, how much weight is given to the views of the SHPO? Do the views of the SHPO generally take precedence over views within your agency or FHWA?

RELATIONSHIPS AMONG SECTION 106 PARTIES

8. How would you characterize your relationship with your SHPO? If you have a good relationship, how did you establish and maintain this relationship? What specific things did you do (e.g., regularly scheduled meetings)?

9. If you characterize your relationship as not very good, what are the main points of conflict between your agency and your SHPO? When conflicts arise between you and the SHPO, how do you resolve these conflicts?

10. Please also answer Questions 8 and 9 in terms of your relationship with your FHWA division office and the tribes you consult with under the Section 106 process.

EVALUATION AND FUTURE STUDIES

11. Have you quantified the benefits of using any of these nontraditional approaches? If so, what measures did you use? Cost? Time? Number of sites avoided? Other measures? If possible, please provide quantitative information on how specific approaches you use have saved time and reduced costs.

12. What types of studies or research do you feel are needed to improve current best practices in archaeological investigations conducted under the Section 106 process? Who should conduct such studies or research? Who should fund these efforts?

Respondent Information

Agency: _____
Name: _____
Title: _____
Street address: _____
City: _____
State: _____
Zip code: _____
Telephone: _____
Fax: _____
E-mail: _____

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM
PROJECT 20-5, SYNTHESIS TOPIC 35-09
MANAGEMENT OF ARCHAEOLOGICAL INVESTIGATIONS

QUESTIONNAIRE FOR PRIVATE SECTOR CULTURAL RESOURCE MANAGEMENT FIRMS

Innovative and Nontraditional Approaches to Archaeological Investigations

The following is a list of innovative and nontraditional tools, approaches, and procedures that have been used across the country to improve and enhance archaeological investigations in the context of Section 106 compliance.

- Programmatic approaches to Section 106 compliance (e.g., using Section 106 programmatic agreements to implement nontraditional approaches that deal with a category of projects or category of archaeological resources).
- Creative mitigation (e.g., "off-site mitigation," which includes analysis of existing collections, development of local or regional archaeological or historical syntheses, and writing of nontechnical reports, in lieu of or supplemental to site data recovery).
- Creative approaches to integrating tribal consultation into archaeological investigations and considering tribal cultural values in assessing significance of archaeological resources.
- Innovative public outreach and education (i.e., whereby public outreach is not simply an add-on to an investigation and goes beyond site tours, temporary exhibits, brochures, and public lectures).
- Remote sensing to identify and map archaeological resources.
- Geomorphological data used as a planning and National Register evaluation tool.
- Innovative site documentation strategies such as the use of electronic field notebooks, digital on-site mapping, and recordation, etc.
- Innovative and nontraditional artifact collection methods.
- Innovative approaches that address the growing curation problem.
- Flexible data recovery research designs.
- Flexibility in spatial or artifact sampling during site identification, evaluation, and data recovery.
- GIS and other information technology used for developing archaeological predictive models.
- Archaeological predictive models used as a planning tool.
- Active use of historic contexts for archaeological resources.
- Prioritization of archaeological research goals.
- Guidance for defining what is "important" information in history or prehistory (i.e., National Register criterion D).
- Flexibility in contracting practices (e.g., cost-plus versus fixed-fee contracts, use of in-house staff as opposed to outsourcing, etc.).

There are other practices that also have an impact on the efficacy of archaeological resource investigations. These practices include:

- Integrating the Section 106 process with the steps in the NEPA process (e.g., phasing archaeological investigations to mesh with timing of NEPA analyses, particularly for categorical exclusion-level projects).
- Integrating the Section 106 process with the steps in the project design process (e.g., determining appropriate level of effort for archaeological investigations during preliminary design, postponing site identification phases until final design, developing investigation strategies that mesh with design/build projects, etc.).
- Training to improve the skills of both agency and consultant staffs.

1. Has your firm been employed to implement or use any of the above practices? If so, briefly describe how these practices were used and if they were successful. Are there other creative measures that you used/developed that streamline the Section 106 process and enhance archaeological conservation efforts? Briefly describe these other measures.

2. What types of constraints have you encountered while implementing these types of practices? How did you overcome these constraints?

3. Has the use of any of these nontraditional approaches not been successful? Briefly describe why they were not successful. If they were not successful, was the DOT aware that they were not successful and did the DOT modify future deliverables to accommodate the problem(s) encountered?

4. Can you provide us with written summaries, articles, reports, or other documents that describe your use of these practices?

DECISION MAKING

5. Based on your experience, who within the state DOTs you work with makes the final decision on the scope of work for traditional archaeological investigations, including data recovery?

6. Who within the DOTs you work with makes recommendations as to whether or not to use innovative and nontraditional approaches to archaeological resource investigations and Section 106 compliance? Who within the DOTs makes the final decision as to whether or not to use these nontraditional approaches? What role has your firm played in these decisions? Has your firm recommended that DOTs use such approaches and were these recommendations subsequently implemented?

7. In making these decisions on level of effort for archaeological investigations or to use nontraditional and innovative approaches, how much weight is given to the views of the SHPO? Do the views of the SHPO generally take precedence over views within the DOT or FHWA?

RELATIONSHIPS AMONG SECTION 106 PARTIES

8. How would you characterize the relationship between the DOTs and SHPOs you work with? If they have a good relationship, how did they establish and maintain this relationship? What specific things did they do? Has your firm been involved in their efforts to establish and maintain this relationship?

9. If you characterize these relationships as not very good, what are the main points of conflict between these agencies? When conflicts arise between these agencies, how do they resolve these conflicts? Has your firm been involved in their efforts to resolve these conflicts?

EVALUATION AND FUTURE STUDIES

10. Have you quantified the benefits of using any of these nontraditional approaches? If so, what measures did you use? Cost? Time? Number of sites avoided? Other measures? If possible, please provide quantitative information on how specific approaches you use have saved time and reduced costs.

11. What types of studies or research do you feel are needed to improve current best practices in archaeological investigations conducted under the Section 106 process? Who should conduct such studies or research? Who should fund these efforts?

Respondent Information

Firm: _____
Name: _____
Title: _____
Street address: _____
City: _____
State: _____
Zip code: _____
Telephone: _____
Fax: _____
E-mail: _____

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM
PROJECT 20-5, SYNTHESIS TOPIC 35-09
MANAGEMENT OF ARCHAEOLOGICAL INVESTIGATIONS

QUESTIONNAIRE FOR
STATE HISTORIC PRESERVATION OFFICES

Innovative and Nontraditional Approaches to Archaeological Investigations

The following is a list of innovative and nontraditional tools, approaches, and procedures that have been used across the country to improve and enhance archaeological investigations in the context of Section 106 compliance.

- Programmatic approaches to Section 106 compliance (e.g., using Section 106 programmatic agreements to implement nontraditional approaches that deal with a category of projects or category of archaeological resources).
- Creative mitigation (e.g., "off-site mitigation," which includes analysis of existing collections, development of local or regional archaeological or historical syntheses, writing of nontechnical reports, in lieu of or supplemental to site data recovery).
- Creative approaches to integrating tribal consultation into archaeological investigations and considering tribal cultural values in assessing significance of archaeological resources.
- Innovative public outreach and education (i.e., whereby public outreach is not simply an add-on to an investigation and goes beyond site tours, temporary exhibits, brochures, and public lectures).
- Remote sensing to identify archaeological resources.
- Geomorphological data used as a planning and National Register evaluation tool.
- Innovative and nontraditional artifact collection methods.
- Innovative approaches that address the growing curation problem.
- Flexible data recovery research designs.
- Flexibility in spatial or artifact sampling during site identification, evaluation, and data recovery.
- GIS and other information technology used for developing archaeological predictive models.
- Use of secure web-based GIS archaeological databases as a tool for obtaining agency and tribal input on project planning and project review.
- Archaeological predictive models used as a planning tool.
- Active use of historic contexts for archaeological resources.
- Prioritization of archaeological research goals.
- Guidance for defining what is "important" information in history or prehistory (i.e., National Register criterion D).
- Flexibility in contracting practices (e.g., cost-plus versus fixed-fee contracts, use of in-house staff as opposed to outsourcing, etc.).

There are other practices that also have an impact on the efficacy of archaeological resource investigations. These practices include:

- Building good relationships and trust among state DOTs and SHPOs and the FHWA.
- Funding of project review positions within SHPOs.
- Training to improve the skills of both agency and consultant staffs.

1. Have you worked successfully with federal agencies to implement any of the above practices? If so, briefly describe how these practices were used and why they were successful. Are there other creative measures that you have developed that streamline the Section 106 process and enhance archaeological conservation efforts? Briefly describe these other measures.

2. What types of constraints have you encountered while implementing these types of practices? How did you overcome these constraints?

3. Has the use of any of these nontraditional approaches not been successful? Briefly describe why they were not successful.

4. Can you direct us to written summaries, articles, reports or other documents that describe the use of these practices in your state?

RELATIONSHIPS AMONG SECTION 106 PARTIES

5. How would you characterize your relationship with your DOT? If you have a good relationship, how did you establish and maintain this relationship? What specific things did you do (e.g., regularly scheduled meetings)?

6. If you characterize your relationship as not very good, what are the main points of conflict between your agency and your DOT? When conflicts arise between you and the DOT, how do you resolve these conflicts?

7. Please also answer Questions 5 and 6 in terms of your relationship with your state's FHWA division office.

EVALUATION AND FUTURE STUDIES

8. Do you have any way of quantifying the benefits of using any of these nontraditional approaches? That is, savings in cost or time? Numbers of sites avoided? Other measures such as members of the public reached with information? If you have any such quantitative data, could we have access to them?

9. What types of studies or research do you feel are needed to improve current best practices in archaeological investigations conducted under the Section 106 process? Who should conduct such studies or research? How could these efforts be funded?

Respondent Information:

Agency: _____
Name: _____
Title: _____
Street address: _____
City: _____
State: _____
Zip code: _____
Telephone: _____
Fax: _____
E-mail: _____

APPENDIX B

Agencies, Tribes, and Consultants Responding to Survey Questionnaire

Departments of Transportation

Alabama
Arkansas
California
Colorado
Delaware
Florida
Georgia
Idaho
Illinois
Iowa
Kansas
Kentucky
Louisiana
Maine
Minnesota
Mississippi
Montana
New Hampshire
New Jersey
New Mexico
New York
Nevada
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
South Dakota
Texas
Utah
Virginia
Wisconsin
Wyoming

Tribes

Caddo Nation of Oklahoma
Wichita and Affiliated Tribes of Oklahoma
Gila River Indian Community
Eastern Band of the Cherokee Indians
Shoshone–Bannock Tribe
Confederated Tribes of the Umatilla Indian Reservation

State Historic Preservation Offices

Florida
Minnesota
Nevada
New Jersey
Ohio
Pennsylvania
Texas

Consultants

Archaeological Investigations NW, Inc.
Commonwealth Cultural Resources Group, Inc.
Cultural Resource Analysts, Inc.
New South Associates, Inc.
TRC Garrow Associates, Inc.

Federal Highway Administration

Arizona State Division Office
Colorado State Division Office
Kentucky State Division Office
Ohio State Division Office
Pennsylvania State Division Office

APPENDIX C

Preliminary Results from a Working Conference on Enhancing and Streamlining Section 106 Compliance and Transportation Project Delivery, Santa Fe, New Mexico, February 2004

Note: The recommendations and action items that follow were identified by participants at the Santa Fe conference. They do not represent the official recommendations or opinions of the Federal Highway Administration, the Advisory Council on Historic Preservation, any State Department of Transportation, any sovereign tribal government, the American Association of State Highway and Transportation Officials, or the National Conference of State Historic Preservation Officers. The pages presenting the conference recommendations are direct transcriptions of flip-chart notes written by participants, with some editing.

OBJECTIVE AND FORMAT OF CONFERENCE

A working conference to develop effective strategies that enhance and streamline the Section 106 compliance process in relation to the transportation project delivery process was held in Santa Fe, New Mexico, on February 22–25, 2004. This invitation-only conference was sponsored and funded by the FHWA, AASHTO, the National Conference of State Historic Preservation Officers (NCSHPO), and the SRI Foundation. The conference did not examine or make recommendations on changing current historic preservation or transportation laws and regulations, but rather focused on best practices for working within the current regulatory and statutory structure.

The specific issues and associated best practices examined during the conference included:

- Survey/inventory methods
- Inventory, evaluation, effects, and mitigation documentation—what, when, and why
- Archaeological predictive modeling
- Agency review processes
- Evaluation of historic resource significance (i.e., National Register eligibility)
- Resolution of adverse effects
- Roles and responsibilities of the players
- Tribal participation and consultation
- Public involvement
- Information technology as a compliance/preservation tool
- Creative mitigation
- Effective use of programmatic agreements.

The conference format involved the use of small, facilitated breakout groups and brainstorming on these issues and topics, in addition to large group discussions.

Conference attendees came to the meeting prepared to discuss and evaluate the various best practices that exist across the country. Before the conference, attendees were sent a package containing information on a wide range of best practices from state departments of transportation (DOTs), Tribal Historic Preservation Officers (THPOs), and State Historic Preservation Officers (SHPOs). These best practices were selected from the FHWA's stewardship/streamlining and historic preservation websites, the results of various NCHRP studies, and other sources.

The "products" resulting from this working conference consisted of specific recommendations, solutions, and innovations to enhance and streamline the Section 106 and project delivery process. These solutions, recommendations, and innovations were to be practical and useful; fulfilling the day-to-day needs of historic preservation and transportation professionals.

The conference ended with the development of Action Plans to implement the products and recommendations of the conference. The Action Plans identified the organizations and leaders that will champion these products and recommendations. The Action Plans also included recommendations on how to inform others about the results of the conference. This will be accomplished through various web sites and the listserves of the organizations represented at the conference. A conference report will also be produced after the conference. Copies of the report will be sent to all conference participants and the agencies and organizations represented at the conference. The goal is to maintain the momentum of the conference and to work toward implementing the recommendations of the conference, and to seek funding if required.

CONFERENCE ATTENDEES

The following is a list of conference attendees:

- Executive Director and President of the NCSHPO
- SHPO representatives
- THPOs and tribal representatives
- FHWA's Federal Preservation Officer
- AASHTO representative
- State DOT representatives
- Executive Director of the Advisory Council on Historic Preservation (ACHP)

- American Cultural Resource Association (ACRA) representatives (ACRA represents historic preservation consultants around the country)
- National experts in historic preservation and transportation information technology and management programs.

SRI Foundation, with assistance from URS Corporation, served as the facilitators for the working conference and handled all conference logistics.

CONFERENCE RESULTS

Conference participants identified five Action Plans to enhance and streamline Section 106 compliance and transportation project delivery:

- Pre-project planning—integrating cultural and natural resources early in pre-project planning and programming, re-energizing the development and appropriate use of historic contexts, examining pre-project planning models.
- Improving the Section 106 process and project delivery—improving mitigation efforts, creating consistent approaches for assessing National Register eligibility and project effects, and developing state-based streamlining agreements.
- Communication—enhancing public benefits, developing guidance on tribal consultation, emphasizing context-sensitive design in terms of historic preservation.
- Funding—fully funding the Historic Preservation Fund, setting aside FHWA grant program funds for historic preservation offices, presenting examples and evidence on the value of pre-planning to agency leaders.
- Information technology/information management systems—creating a model DOT information clearinghouse website, designing a model project activity tracking program, and fostering and improving tribal information technology.

The following pages present a more detailed description of the conference recommendations and Action Plans. These pages are direct transcriptions of flip-chart notes written by conference participants, with some editing.

RECOMMENDATIONS AND ACTION PLANS

Pre-Project Planning

Action #1

Recommend to Environmental Streamlining Task Force that they adopt/institutionalize a communication process, to be developed in each state, to share data and program priorities to integrate cultural and natural resources early in pre-project planning and programming.

Benefits—Could spin off into natural resources and other agencies.

- Data sharing
- Priorities identified
- Areas of concern identified (geographical/topical)
- Developing areas of concern identified
- Agencies/tribes and state specific agencies participants identified early in process [e.g., metropolitan planning offices (MPOs)].

Who
Fred Skaer (FHWA) and John Fowler (ACHP)

When (time frame)
March 2004

Definable Outcome/Product:

- Task force adopts recommendations.
- Guidance to state offices/agencies/tribal governments to implement recommendations.
- Results in less conflict in programs and improved integration of planning and programs.

Action #2

Re-energize agencies/communities on the development and appropriate use of historic contexts.

- Convene practitioners.
- Guidance package (toolkit) for SHPO/THPO/DOTs, to include:
  - Model programmatic agreement (PA) (stipulating process for developing historic contexts). PA could stipulate that historic context development is in lieu of/as mitigation,
  - Guidance on public involvement associated with context development,
  - Outline of what a historic context is,
  - How to apply historic contexts, and
  - Scope of work for consultants to identify historic contexts.

Concerns:

- Are historic contexts being used?
- Do we need to follow whole process (e.g., submit multiple nominations)?
- Costly effort with little use?

Who
Coalition: National Park Service (NPS), FHWA, NCSHPO, ACHP, National Association of Tribal Historic Preservation Officers (NATHPO), AASHTO

When (time frame)

Toolkit:	October 2004–October 2005
Convening practitioners:	October 2005

Definable Outcome/Product:

- Toolkit (see above).
- Convening practitioners.
- States producing useful historic contexts and employing them in pre-project planning.

Action #3

Undertake research to examine pre-project planning models. Possible funding sources: NCHRP, AASHTO's Standing Committee on the Environment (SCOE).

Practical Research Options:

- Examine natural resource models (e.g., North Carolina's Ecosystem Enhancement Program) to determine if applicable to cultural resources in terms of pre-planning efforts.
- Search for cultural resource practice:
  - Creative early planning
  - Creative early mitigation.
- Conduct study on benefits, including cost savings, of pre-planning.

Benefits:

- Short-term completion of studies through established research programs
- Low-to-moderate costs
- Relatively comprehensive examination
- Better projects/protection of historic resources.

Who
AASHTO, SCOE, FHWA

Time Frame: April 2004 (topic to be presented at annual SCOE meeting). Research—12 months

Definable Outcome/Product:

- Research reports (including SHPO/THPO).
- Presentations at conferences (e.g., SCOE, TRB annual/summer meetings).

IMPROVING THE SECTION 106 PROCESS AND PROJECT DELIVERY

Mitigation Improvements

Outcome: Joint ACHP/FHWA policy statement on:

- Why creative mitigation is good for resources, descendant communities, public benefits, and project delivery.
- Encouragement/authorization for DOTs, SHPOs, THPOs to do creative mitigation.
- Where to find good examples.

Time Frame: September 30, 2004—issuance of policy

Responsible Parties/Tasks:
ACHP and FHWA organize a working group involving primary stakeholders.

Recommended Follow-Up Activities:

- Encourage other agencies to adopt the policy.
- Develop mechanism for showcasing successful creative mitigations (ongoing) and for information sharing.

CONSISTENT APPROACHES FOR ASSESSING ELIGIBILITY AND EFFECTS

Outcome #1: Practice-based guidance on preparing:

- Eligibility statements
- Assessments of effects.

Time Frame: March 1, 2005

Responsible Parties/Tasks:

- NCSHPOs to convene a working group comprising SHPO, THPOs, transportation agencies, NPS, ACHP, and the ACRA.
- Broad comment and opportunities for additional constituencies.

Outcome #2: Development and delivery of training for all Section 106 practitioners based on the guidance developed in Outcome #1:

- Web-based or video delivery
- Modular for property types
- Include assessment instrument.

Time Frame: (1) Feasibility study—March 1, 2005; (2) Course available March 1, 2006

Responsible Parties: SRI Foundation and cast of thousands for (1) and TBA for (2)

STATE-BASED STREAMLINING AGREEMENTS

Outcome: Make available to state DOTs encouragement and assistance to develop streamlining agreements. Examples:

- Delegation of PAs (e.g., Certified Local Governments, Navajo Nation, California, Ohio, Vermont).
- DOT funded positions at SHPO.
- Informal agreements—protocols, memoranda of understanding.
- Programmatic approaches for categories of undertakings, properties, and effects, rather than case-by-case process.

Time Frame: Initial contact to FHWA divisions—December 31, 2004

Responsible Parties:

- FHWA with assistance from AASHTO to develop encouragement and assistance.
- NCSHPO to disseminate information to SHPOs.
- FHWA to request NPS assistance to inform tribes.

COMMUNICATION

Public Benefit

Product: DOTs, SHPOs, and THPOs cooperate to publicize positive preservation outcomes.

Time Frame: Ongoing

Product: List of best practices for creative preservation outcomes. Publicize examples through educational programs, publications, websites, etc.

Responsible Parties: FHWA, SHPOs, DOTs, THPOs

Time Frame: Ongoing

Product: Eliciting and incorporating a community's preservation values into project outcomes.

Responsible Parties: DOTs, SHPOs, communities

Time Frame: Early and ongoing

TRIBAL CONSULTATION

Product: Series of guidance documents on tribal consultation:

- Best practices on FHWA website.
- One time regional meetings for FHWA/DOT, hosted by tribes.

Responsible Parties: FHWA/ACHP

Time Frame: Spring 2004–FY05

Product: National model for tribal mentoring.

Responsible Parties: New Mexico SHPO/Confederated Salish & Kootenai Tribes; New Mexico DOT

Time Frame: End FY05

COMMUNITIES/PUBLIC

Product: Emphasize historic preservation within context-sensitive design guidance to identify and engage Certified Local Governments (CLGs), MPOs, and key members of communities early in project planning.

Responsible Parties: FHWA; SHPO to develop community contact list

Time Frame: End of FY05

FUNDING

Goal 1:

$50 million from SHPOs.
$12 million from THPOs.

Responsible Parties:
Secretaries of Transportation, Housing and Urban Development, Department of Defense, Department of Energy, Federal Communications Commission, Health and Human Services Department of Homeland Security, Department of Agriculture

- United South and Eastern Tribes (USET) and other tribes.
- National Governors Association (NGA).
- NCSHPO.
- NATHPO.
- PA.

Lead Parties:
John Nau—ACHP, John Horsley—AASHTO

Process:
Letter(s) to Office on Management and Budget (OMB) requesting budget enhancement in Historic Preservation Fund for FY06

1. Secretary letter
2. Letter from USET and other tribes
3. NGA.

Time Frame:

1. Spring 2004 lead parties meet with Secretaries.
2. Letter and best practice information sheet to OMB by summer 2004.
3. Efforts monitored by NCSHPO, NATHPO, AASHTO.

Soundbyte: Historic Preservation Office (HPO)-sized set aside.

Goal 2:

Carve out HPO set aside from FHWA grant programs:

- Technology transfer program.
- Environmental stewardship and streamlining program.
- Transportation Enhancement program (with a guarantee percentage to go to transportation-related historic preservation efforts).
- Statewide planning and research funds.

Time Frame: FY05 and beyond FY05

Provide information to HPOs and DOTs of available funding sources.

Time Frame: Immediately.

Responsible Parties: FHWA, AASHTO, Santa Fe conference participants

Lead Parties
MaryAnn Naber—FHWA, Fred Skaer—FHWA, John Horsley—AASHTO

Goal 3:

Present to Mary Peters (FHWA) and U.S. Congress examples on best practices and cost-saving models of pre-planning that improve the Section 106 compliance process and project delivery.

Responsible Parties: TRB/NCHRP, large private-sector consulting firms, DOTs, Preservation Action, THPOs

Lead Parties:
NCSHPO (Jon Smith, Indiana SHPO) and Allyson Brooks (Washington State SHPO)

Time Frame: Summer 2004

INFORMATION TECHNOLOGY/INFORMATION MANAGEMENT SYSTEMS

Recommendation and Action Plan: Creating Model DOT Information Clearinghouse Web Page

Designed to

- Provide and query historic property information to identify, evaluate, determine effects, and resolve adverse effects.
- Obtain historic context reports and allow for updates—capture and enter data electronically.
- Formally link federal and state agencies and tribes [through, for example, a Memorandum of Understanding (MOU)] to ensure development, implementation, management/update of information.
- Provide best practices information.
- Show examples of MOUs/agency information technology agreements and documents.
- Provide guidance on "staged approach" to information technology system development, use of data, reliability of data.
- Include written reports or articles on positive and negative experiences in development of information technology systems.

Attributes:

- Capture specific transportation project and Section 106 compliance costs, effects, benefits—to allow for FHWA to report on project successes and failures.
- When FHWA funding used for transportation projects, would require state DOTs to provide information on project successes and failures—web page could provide one or more specifications for requirements for contractors (e.g., sample language)—to fill out data entry in specific way.
- Designed to share information from multiple sources.
- Share information on how to pay for state information technology data plan development (perhaps show 2 or 3 examples).

Recommended Action Plan and Dates and Parties

Action Steps	Who?	When?
1. Secure 3rd party (neutral) website address	Eric Ingbar	3/31/04
2. Complete development of clearinghouse information technology structure	IT Work group	5/30/04
3. Develop scope of work for larger study/update	TBD	TBD
4. Secure FHWA and other partner funding to update and populate with new data (Phase II)	TBD	TBD
5. Roll out products through "webinar"	TBD	TBD

ACTION PLAN TO DESIGN PROJECT ACTIVITY TRACKING DATA MODEL

Designed to

- Enhance integration of transportation planning and historic preservation to answer questions about
  - National Register eligibility of resources
  - Was historic property affected? How?
  - Treatment outcome?
  - Might also add information on such items as: Subject to easement? Status as of "x" date? Received historic preservation funding?
- Better address "environmental commitments" than present efforts.
- Be useful for states that have high level of information technology sophistication, but also useful for states that need new elements (e.g., National Register evaluations, project tracking, and cost benefits).
- Shared information technology/information management systems that allow sharing of information and track decisions about projects and historic properties and historic preservation.

Attributes:

- Be a model to share information about streamlining.
- Will develop specific questions for business plan.

Action Steps:

1. Information technology study committee designs prototype model. Optimally, have two or three state DOTs involved (California, Florida, North Carolina, Wyoming?). Estimated to require 80 h of donated time. To be completed by 3/31/2004.
2. Identify scope of work and cost estimate; secure FHWA funds to implement and provide completed business plan.

PROPOSED ACTION ITEM: TRIBAL INFORMATION TECHNOLOGY

Designed to

- Have locational data on religious or culturally significant areas (sensitivity areas to be avoided) for pre-planning.
- Provide updated contact information for tribes with interest in historical areas outside of current tribal lands. Include map locations.
- Provide model process to develop information technology capability of tribes for historic preservation efforts.
- Be a marketing tool for future similar efforts.
- Be an object on "IT Information Clearinghouse."
- Assess tribal systems and evaluate effectiveness. Identify areas for improvement.

Outcome:
Results provided to tribes only, by means of a conference/teleconference or "webinar."

Attributes:
Used as a way to foster more effective communication among tribes and FHWA, state DOTs, SHPOs, etc.

Action Steps:

Feasibility Study:

Approach NATHPO and other tribal organizations (e.g., the TRB's A5020 Committee on Native American Transportation Issues) and assess feasibility, support, and interest for conducting a pilot study that (1) compiles information on current best practices on tribal-based information technology historic preservation databases/systems and (2) determines if and how these databases/systems can be distributed to tribes that have no information technology programs.

Date: May 2004

Pilot Study:

If a decision is made to proceed with the pilot study, then IT Study Group develops scope of work, in consultation with NATHPO and other national and regional-level tribal organizations. The regional organizations/programs and key tribes that may be the most effective venue for the study includes

- Confederated Salish & Kootenai Tribes
- Confederated Tribes of the Umatilla Indian Reservation
- Navajo Nation
- Tribal colleges
- Tribal Technical Assistance Program, Institute for Transportation Management (Ronald Hall, Colorado State University)
- Indigenous Communities Mapping Initiative.

Ensure FHWA funds pilot study, initiate by November 1, 2004, and complete by October 30, 2005.

Cost Estimates for Feasibility Study
Estimate 80 person hours

Responsible Parties:
IT Work Group suggests that AASHTO be asked whether this fits within the scope of AASHTO's currently being developed "Best Practices in Tribal Consultation Web Site." If not, give to FHWA and ACHP for consideration. Write-up completed by March 30, 2004, as a prospectus for the initial feasibility study.

APPENDIX D

Summary of Effective Practices in Archaeological Investigations of State Departments of Transportation

TABLE D1

Practices	State Departments of Transportation												
	AL	AR	AZ	CA	CO	DE	FL	GA	ID	IL	IA	KS	KY
Communication													
PAs/MOUs with tribes			X		X			X			X		
Tribal summit; proactive, pre-project tribal consultation								X	X		X	X	
Reports for public		X			X	X						X	
Videos for public				X									
Development of archaeological curriculum								X					
Internal Business Practices													
Funding SHPO position	X	X		X					X				X
Project Delivery: Integrating 106, NEPA, and Design													
Phased approach to archaeological inventory								X					
Pre-Project Planning													
Programmatic agreements	X	X	X	X		X	X		X	X	X		
Innovative collection and curation standards										X			
Archaeological predictive modeling		X					X						
Computerized archaeological databases and portals			X	X			X						
Geoarchaeology as planning tool				X									
Archaeological syntheses					X								
Innovative Approaches to Section 106 Steps													
Identification and national register evaluations	X			X	X					X			X
Innovative research designs	X					X							
Creative mitigation	X	X						X					

TABLE D1 (*Continued*)

Practices	State Departments of Transportation												
	LA	ME	MD	MN	MS	MT	NH	NJ	NM	NY	NV	NC	ND
Communication													
PAs/MOUs with tribes	X			X								X	
Tribal summits; proactive, pre-project tribal consultation				X	X	X			X				X
Reports for public							X	X	X				
Videos for public								X					X
Development of archaeological curriculum									X				X
Internal Business Practices													
Funding SHPO position	X								X				
Project Delivery: Integrating 106, NEPA, and Design													
Phased approach to archaeological inventory													
Pre-Project Planning													
Programmatic agreements		X	X				X	X	X				
Innovative collection and curation standards						X		X			X		
Archaeological predictive modeling				X								X	
Computerized archaeological databases and portals				X					X	X			
Geoarchaeology as planning tool				X									
Archaeological syntheses											X		
Innovative Approaches to Section 106 Steps													
Identification and national register evaluations	X			X		X		X					X
Innovative research designs													
Creative mitigation				X		X			X		X		X

TABLE D1 (*Continued*)

Practices	State Departments of Transportation												
	OH	OK	OR	PA	RI	SD	TX	UT	VA	VT	WA	WS	WY
Communication													
PAs/MOUs with tribes		X	X		X		X						
Tribal summits; proactive, pre-project tribal consultation			X	X	X		X				X	X	
Reports for public				X						X			
Videos for public													
Development of archaeological curriculum							X						
Internal Business Practices													
Funding SHPO position	X				X								
Project Delivery: Integrating 106, NEPA, and Design													
Phased approach to archaeological inventory	X			X			X		X				
Pre-Project Planning													
Programmatic agreements	X		X	X	X		X		X	X	X		X
Innovative collection and curation standards		X		X									X
Archaeological predictive modeling	X			X			X		X	X			
Computerized archaeological databases and portals	X		X	X			X		X	X		X	X
Geoarchaeology as planning tool							X						X
Archaeological syntheses				X						X			
Innovative Approaches to Section 106 Steps													
Identification and national register evaluations			X										
Innovative research designs								X		X		X	
Creative mitigation	X			X			X	X				X	

Notes: This table is based on the literature review and survey responses from state DOTs, in addition to responses from consultants working for the DOTs. DOT = department of transportation; PAs = programmatic agreements; MOUs = memoranda of understanding; SHPO = state historic preservation offices.

Abbreviations used without definitions in TRB publications:

AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
IEEE	Institute of Electrical and Electronics Engineers
ITE	Institute of Transportation Engineers
NCHRP	National Cooperative Highway Research Program
NCTRP	National Cooperative Transit Research and Development Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
SAE	Society of Automotive Engineers
TCRP	Transit Cooperative Research Program
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation