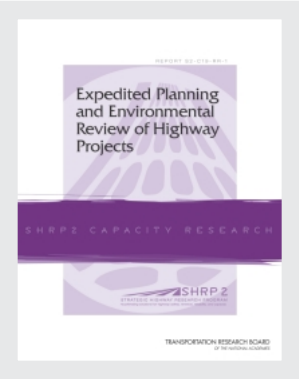

Expedited Planning and Environmental Review of Highway Projects

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Parametrix, Inc.; Venner Consulting; and Institute for Natural Resources, Oregon State University

The Second
STRATEGIC HIGHWAY RESEARCH PROGRAM

SHRP 2 REPORT S2-C19-RR-1

Expedited Planning and Environmental Review of Highway Projects

PARAMETRIX, INC.
with
VENNER CONSULTING
INSTITUTE FOR NATURAL RESOURCES, OREGON STATE UNIVERSITY

TRANSPORTATION RESEARCH BOARD
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The Second Strategic Highway Research Program

America's highway system is critical to meeting the mobility and economic needs of local communities, regions, and the nation. Developments in research and technology—such as advanced materials, communications technology, new data collection technologies, and human factors science—offer a new opportunity to improve the safety and reliability of this important national resource. Breakthrough resolution of significant transportation problems, however, requires concentrated resources over a short time frame. Reflecting this need, the second Strategic Highway Research Program (SHRP 2) has an intense, large-scale focus, integrates multiple fields of research and technology, and is fundamentally different from the broad, mission-oriented, discipline-based research programs that have been the mainstay of the highway research industry for half a century.

The need for SHRP 2 was identified in *TRB Special Report 260: Strategic Highway Research: Saving Lives, Reducing Congestion, Improving Quality of Life*, published in 2001 and based on a study sponsored by Congress through the Transportation Equity Act for the 21st Century (TEA-21). SHRP 2, modeled after the first Strategic Highway Research Program, is a focused, time-constrained, management-driven program designed to complement existing highway research programs. SHRP 2 focuses on applied research in four areas: Safety, to prevent or reduce the severity of highway crashes by understanding driver behavior; Renewal, to address the aging infrastructure through rapid design and construction methods that cause minimal disruptions and produce lasting facilities; Reliability, to reduce congestion through incident reduction, management, response, and mitigation; and Capacity, to integrate mobility, economic, environmental, and community needs in the planning and designing of new transportation capacity.

SHRP 2 was authorized in August 2005 as part of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The program is managed by the Transportation Research Board (TRB) on behalf of the National Research Council (NRC). SHRP 2 is conducted under a memorandum of understanding among the American Association of State Highway and Transportation Officials (AASHTO), the Federal Highway Administration (FHWA), and the National Academy of Sciences, parent organization of TRB and NRC. The program provides for competitive, merit-based selection of research contractors; independent research project oversight; and dissemination of research results.

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The members of the technical committee selected to monitor this project and to review this report were chosen for their special competencies and with regard for appropriate balance. The report was reviewed by the technical committee and accepted for publication according to procedures established and overseen by the Transportation Research Board and approved by the Governing Board of the National Research Council.

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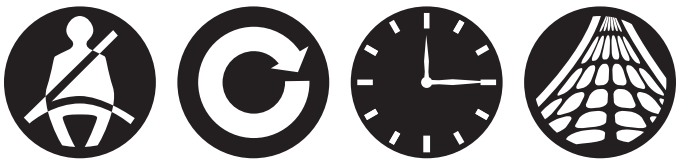

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The research reported on herein was performed by Parametrix, with support from Venner Consulting, and the Institute for Natural Resources (INR) at Oregon State University. Jeff Heilman of Parametrix was the principal investigator. The other authors of this report are Marie Venner (co-principal investigator) of Venner Consulting, and Colin McConnaha, Paul Manson, and Kevin Halsey of Parametrix. The authors acknowledge the contributions to this research from Lisa Gaines and Sue Lurie of INR, as well as the multiple transportation professionals who provided their insights and information through the interviews that informed the research findings.

FOREWORD

Stephen J. Andrle, *SHRP 2 Deputy Director*

This report will be of interest to practitioners who are expediting the delivery of transportation projects in the areas of long-range planning, corridor planning, programming, and environmental review. It describes constraints on expediting project delivery and useful strategies for achieving expedited delivery. While the strategies and constraints are associated with planning and environmental review, many of the strategies are applicable to design and construction. The results of this project are also available on the SHRP 2 website Transportation for Communities—Advancing Projects through Partnerships (TCAPP). TCAPP provides a series of self-evaluation questions organized around the constraints to help determine whether an agency is structured to regularly deliver projects in an expedited manner.

Delay in delivering new transportation projects is a national concern because it increases costs, prolongs congestion, and denies the nation the economic and mobility benefits of added transportation capacity. Congress charged the SHRP 2 Capacity focus area with producing "approaches and tools for *systematically* integrating environmental, economic, and community requirements into the analysis, planning, and design of new highway capacity" (emphasis added). Strategies to expedite project delivery, therefore, must reflect this broad mandate. Further, to have an impact on the nation, they must become standard practice. This report identifies strategies that have been successfully used to expedite planning and environmental review of transportation and some nontransportation projects within the context of existing laws and regulations.

In this report, 16 common constraints on project delivery are identified from the literature and case studies. Twenty-four strategies are discussed for addressing or avoiding the constraints. These strategies are grouped into six expediting themes:

- Improve public involvement and support;
- Improve resource agency involvement and collaboration;
- Demonstrate real commitment to the project;
- Improve internal communication and coordination;
- Streamline decision making; and
- Integrate across all phases of project delivery.

The report catalogs the constraints, their potential severity, and the effect they can have on project delivery. Since it is not always clear to practitioners that they are facing a constraint, leading and lagging indicators are provided. The likely effects of not addressing a constraint are categorized as low, medium, and high; multiple strategies are suggested for each severity category. The report describes each mitigation strategy, links it to the constraints, and references cases where the strategy was used and to what effect.

A significant but perhaps obvious finding is that benefits do not always accrue in the stage of a project to which a strategy is applied. For instance, making up-front commitments to environmental enhancements does not necessarily expedite planning but will likely expedite later phases, such as NEPA compliance, permitting, design, and possibly construction.

Strategies such as programmatic permits or regional analysis frameworks can expedite project delivery but must be established before the project begins.

All these strategies are associated with cases in which projects were advanced through the planning and environmental review process faster than usual. Cases for analysis were found through a review of transportation and nontransportation literature, award programs, projects funded through the American Recovery and Reinvestment Act (ARRA), and a review provided by the Federal Highway Administration of its internal Environmental Document Tracking System. The cases were searched using terms associated with expediting delivery. Analysis of the cases focused on application of a specific expediting strategy, including project attributes that influenced success; constrains that were addressed or proactively avoided; and lessons learned by the project team through follow-up interviews.

The information in this report and its companion website will be useful to planners and engineers in state departments of transportation, metropolitan planning organizations, special transportation authorities, environmental resource agencies, and local governments. The strategies have broad applicability and, although applied to expansion of highway capacity, are relevant to adding capacity to any transportation mode or major infrastructure development.

CONTENTS

Online version of this report:
www.trb.org/Main/Blurbs/165282.aspx.

Executive Summary

The main objectives of this study were to identify, describe, and evaluate effective tools and techniques for expediting the delivery of transportation projects and to present that information so that it is accessible and useful to practitioners and decision makers. In addition to this report, key findings will also be available on the Transportation for Communities website (*1*). That site will provide tools and information that can be used to understand and implement specific strategies for expediting project delivery. The literature review indicated that the transportation sector dominates the pool of existing studies and information related to evaluating project delay and promoting expedited project delivery. The reasons for this are probably twofold: first, completing the environmental impact statement (EIS) process—a task that consumes a substantial share of the overall schedule to deliver large, federalized projects—consistently takes longer for transportation projects than for any other sector (*2*); second, starting in the late 1990s, federal legislation, executive orders, and policies directed the transportation sector to improve the speed of project delivery. The last three federal transportation authorization bills have included language aimed at reducing project delay. Most recently, the Federal Highway Administration (FHWA) launched the Every Day Counts initiative, which is "designed to identify and deploy innovation aimed at shortening project delivery" (*3*).

Projects can be either delayed or expedited in every phase of delivery. This study was specifically directed to evaluate the earlier phases of delivery that lead up to final design and construction. Nearly all of the strategies described here are implemented during the planning, National Environmental Policy Act (NEPA), or permitting phases. There are two important points to make in regard to the timing of the strategies. The benefits of many strategies are not always realized in the phases in which they are implemented; sometimes the expediting benefits do not accrue until later phases of project delivery. For example, making up-front commitments to environmental enhancement during the planning phase of a project will not necessarily expedite planning, but such commitments are likely to expedite subsequent phases such as NEPA compliance, permitting and design, and possibly even construction. The other important point is that although programmatic instruments such as programmatic permits or regional analysis frameworks can expedite project delivery, they typically need to be developed before the project begins.

This research began with reviewing existing studies, award programs, agency databases, and other information relevant to delay and streamlining. The purpose was to begin identifying areas in which the existing literature was relatively thorough and areas in which it was limited and to begin identifying potential projects that could provide examples of successful expediting strategies. Research then continued with interviews of members of the teams who had implemented the identified projects and/or with stakeholders familiar with the project. The strategies were then evaluated based on the constraints they address, the effect they have on project schedules, general cost considerations for implementing the strategies, any risks the strategies might introduce, other benefits of the strategies, and considerations for applying or transferring these strategies to other

projects. This report includes case study descriptions for many of the projects from which the strategies have been drawn. However, if the projects are already adequately described in other documentation or web sites, this report generally refers to those sources rather than repeating lengthy case study descriptions.

This report presents research methods and findings (Chapter 1), common types of expediting constraints (Chapter 2), specific strategies that can address these constraints (Chapter 3), and case studies that provide further illustration of how these constraints have been encountered and successfully addressed (Chapter 4). The report conclusion (Chapter 5) considers the results of the study and recommends areas for additional research. The documentation in this report that is likely to be most immediately useful to practitioners includes

- Constraints and strategy analysis (Chapter 2): Constraints to expediting are described and linked to the strategies that address them. The discussion and presentation of constraints provide diagnostic information that allows a practitioner to identify both leading and lagging indicators for each of the listed constraints and potential strategies to eliminate or reduce delay.
- Expediting strategies (Chapter 3): Each strategy outlines key information, including the project development phase(s) in which the strategy is applied; the decision points it helps to inform or expedite (many strategies address multiple decisions); the particular constraints or causes of delay the strategy addresses; a description of the strategy; examples of specific successful applications of the strategy (including references and links to more information, if available); an evaluation of the strategy's implications for schedule, cost, risks, benefits, and transferability; notes about applying the strategy; and lessons learned from previous applications.

The lists of constraints and strategies in this report are not exhaustive. The strategies included are those that met the criteria described in Chapter 1 and that could be completed within the time restrictions of the study. The research team began drafting a list of fundamental expediting themes during the initial phase of the research and refined this list as the research progressed. The six final expediting themes, with expediting strategies organized by theme, are introduced in the following sections.

Improve Public Involvement and Support

Building and maintaining public support can be one of the most crucial yet challenging keys to expediting project delivery. Significant controversy and opposition commonly delay project delivery. Some of the evaluated strategies that can be applied to public communication and involvement in order to expedite project delivery include

- Conducting highly responsive public outreach that addresses more than the narrowly defined transportation objective to improve public interest and engagement;
- Employing principles of context-sensitive solutions to better understand and address community values;
- Hiring a media relations manager to more effectively engage and communicate with media outlets; and
- Providing up-front commitments to ensure a net benefit to affected resources that are important to stakeholders.

Improve Resource Agency Involvement and Collaboration

Fostering trust and constructive engagement with resource agencies can minimize or avoid a variety of factors that delay project delivery. Some strategies include

- Using performance measures in permits to provide assurance to resource agencies (this can minimize protracted analysis and debate over impacts and mitigation);
- Using concurrent, rather than sequential, review of documents and permits;

- Developing programmatic permits and approvals to streamline permitting for individual projects;
- Developing and using an interagency dispute-resolution process;
- Funding dedicated transportation liaison positions to ensure resource agencies can dedicate staff to collaborate during project development;
- Using a facilitator to more clearly align expectations up front;
- Being particularly engaged with and responsive to resource agency issues; and
- Providing up-front environmental commitments to proactively address resource concerns.

Demonstrate Real Commitment to the Project

Financial, political, staffing, and other commitments are needed for a project to succeed. A high-profile demonstration, including a commitment to do what is necessary to expedite delivery, can be a major factor in overcoming challenges and achieving success. Strategies include

- Securing early commitment to construction funding to create momentum, engaging stakeholders, and demonstrating that the project is a high priority;
- Making early commitments to environmental or community enhancements that go beyond basic regulatory requirements; and
- Empowering a high-profile, project-level decision council with direct access to agency executives and elected officials.

Improve Internal Communication and Coordination

Cumbersome communication within project teams or unclear protocols and responsibilities are commonly cited constraints that are typically within the direct control of the transportation agency. Some of the expediting strategies evaluated to improve internal communication and coordination include

- Establishing protocols and time frames to expedite internal review and decision making (see the next section on streamlining decision making);
- Conducting a readiness assessment with strategic oversight to ensure the project has the resources needed;
- Co-locating project teams; and
- Reviewing documents and permits concurrently rather than sequentially.

Streamline Decision Making

Projects cannot start or progress without numerous, periodic decisions, both large and small. Decisions are often needed within specific time frames to avoid delay, but if made hastily decisions can create more time loss when they must be revisited. Strategies include

- Developing and implementing a process to expedite internal decision making by assigning clear roles, responsibilities, and time frames for decisions;
- Developing a consolidated decision council of senior agency staff with authority to make most decisions and with ready access to agency executives; and
- Developing a dispute-resolution process to avoid protracted or stalled debate.

Integrate Across All Phases of Project Delivery

Every phase of project delivery involves analysis, findings, documentation, and decisions that allow a project to progress. As projects advance from one major phase to the next (e.g., from planning to NEPA, NEPA to final design, and final design to construction), the responsibility for implementing project delivery typically transitions from one group or division to another. These transitions pose risks that previous work and decisions will be reopened or redone either because

Table ES.1. Expediting Strategies by Phase of Project Delivery

	Issues Arising Late Cause Project Change	Stakeholder Controversy and Opposition	Unusually Large Scale of and/or Complex Project or Program	Relocation Process Delays Construction	Ineffective Internal Communication	Insufficient Public Engagement or Support	Negative or Critical Coverage from the Media	Inefficient Section 106 Consultation with SHPO	Conflicting Resource Values	Lengthy Review/ Revision Cycles	Slow Decision Making	Inability to Maintain Agreement	Difficulty Agreeing on Impacts and Mitigation	Inordinate Focus on Single Issue	Avoiding Policy Decisions through Analysis	Lack of Dedicated Staff
Change-control practices	•															
Consolidated decision council					•						•	•		•	•	
Context-sensitive design	•	•							•							
Coordinated and responsive agency involvement										•	•					
Dispute-resolution process	•								•			•	•	•	•	
DOT-funded resource agency liaisons											•	•				•
Early commitment of construction funding			•								•	•				•
Expedited internal review and decision making			•		•										•	•
Facilitation to align expectations up front	•	•										•	•	•	•	
Highly responsive public outreach	•	•		•		•	•					•				
Incentive payments to expedite relocations				•												
Media relations manager		•		•		•	•					•				
Performance standards			•						•							
Planning and environmental linkages	•							•	•	•	•	•	•			
Planning-level environmental screening criteria	•							•	•	•		•	•	•		
Programmatic agreement for Section 106								•								
Programmatic permits			•							•		•	•		•	•
Real-time collaborative interagency reviews	•				•					•	•			•		
Regional environmental analysis framework		•	•						•				•	•	•	
Risk management	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Strategic oversight and readiness assessment			•		•						•	•				•
Team co-location			•		•					•	•					
Tiered NEPA process	•											•				
Up-front environmental commitments			•						•				•		•	

Note: SHPO = state historic preservation office; DOT = department of transportation.

the previous work may not adequately support or reflect the needs of the subsequent phase, or because the previous work may not be understood by those implementing the subsequent phase. It is important to integrate the considerations, findings, decisions, and documentation across phases (in both directions) in order to minimize repeating work and reopening decisions. Managing these tasks to expedite project delivery involves ensuring that expectations are well aligned, data and analysis are transferable across phases, and analysis is well coordinated and focused on informing decisions. Strategies include

- Leveraging analysis and decisions from planning phases during the NEPA process;
- Employing environmental criteria during planning to better support subsequent project development;
- Using a tiered NEPA structure to ensure that corridor planning-level work is reliable for subsequent project-level analysis;
- Using facilitated meetings with resource agencies and stakeholders to align expectations up front; and
- Using change-control practices to manage and reduce unnecessary project changes.

Expediting Strategies by Project Phases

Table ES.1 ties the strategies described in this report to specific phases of project delivery and issues that may be encountered during the project. As noted above and elsewhere in this report, some strategies expedite the phases in which they are applied, while others help to expedite subsequent phases. The table indicates when to apply each strategy. The particular benefits of each strategy, including the timing of those benefits, are discussed in Chapter 3. While this study focuses on describing expediting strategies that can be implemented during the planning, NEPA, and permitting phases of project delivery, some of these strategies can also be applied during construction, as indicated in Table ES.1.

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CHAPTER 1

Research Approach

The main objectives of this study were to identify, describe, and evaluate effective tools and techniques for expediting delivery of transportation projects and to present that information so that it would be accessible and useful to practitioners and decision makers. This study is intended to add to the growing body of research and understanding about expediting transportation project delivery, focusing in particular on the early planning and National Environmental Policy Act (NEPA) phases of delivery, including corridor planning. The study also includes strategies that cross over into the design, permitting, and right-of-way phase. It is worth noting that strategies implemented in the early phases typically provide expediting benefits in subsequent phases of project delivery. While the focus of this research was on specific expediting strategies, this report also addresses barriers (constraints) and includes focused case study write-ups to the extent they are needed to understand or evaluate the strategies.

The terms *expedited delivery, accelerated delivery,* and *streamlining* are used in various regulations, executive orders, and other directives aimed at reducing delay and speeding project delivery. In reviewing the existing literature, these terms are generally used interchangeably. For this report, *expediting* is used unless quoting or referring to other documents or programs that have used a different term. This report does not attempt to build a case for expediting, but rather to describe the constraints to expediting and to provide useful strategies for achieving expedited delivery.

This research began with a review of existing studies and information to help refine the research work plan and a preliminary identification of potential projects that could provide examples of expediting strategies. Once a starting list of strategies and projects was developed, research progressed by interviewing members of the project teams, staff from resource agencies involved with the projects, and other stakeholders who could provide insight into the techniques used to expedite these projects. These techniques, or strategies, were then evaluated, and a comprehensive account of each strategy was developed that included

- A description of the strategy;
- The project development phase(s) in which the strategy is applied;
- The decision points that the strategy can help to inform or expedite (many strategies address multiple decisions);
- The particular constraint(s) or causes of delay the strategy addresses;
- Examples of specific successful applications of the strategy (including references and links to more information when available);
- An evaluation of the strategy's implications for schedule, cost, risks, benefits, and transferability;
- Notes about applying the strategy; and
- Lessons learned from previous applications.

Review of Existing Information and Early Identification of Potential Expediting Strategies

At the outset of this research, the research team used a literature review and web-based search to better define what is known and unknown about expediting project delivery. This process helped to refine the work plan for the research and to begin identifying potential expediting strategies for further study. The review included a broad literature review, a web-based search, a review of projects funded through the American Recovery and Reinvestment Act (ARRA), and an updated review of FHWA's internal environmental document tracking system.

Literature Review Approach

The literature review included a search for both transportation and nontransportation studies related to expediting

project delivery. This review, including a web-based search, confirmed that the transportation sector appears to be much more interested than any other sector in studying this topic. The small number of streamlining studies that did not come from the transportation sector came primarily from the energy sector and from local jurisdiction building permitting (this report includes two case studies of expediting from the energy sector that provide strategies applicable to transportation).

The emphasis on expediting within the transportation sector appears to have begun in earnest in the late 1990s, probably in response to a series of federal directives, starting with the 1998 Transportation Equity Act for the 21st Century (TEA-21). TEA-21 suggested that environmental streamlining processes could provide potential solutions to interagency dispute resolution. The FHWA Office of NEPA Facilitation, in collaboration with the U.S. Institute for Environmental Conflict Resolution, subsequently developed interagency and intergovernmental conflict-management and dispute-resolution guidelines (*1, 2*). Section 1309 of TEA-21 provided congressional direction for environmental streamlining, including expedited delivery and cost savings on federalized transportation projects combined with environmental, cultural, and historic resource protection. Executive Order 13274, signed in 2002, provided further direction for interagency coordination among federal, state, and local governments and tribes. In 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) further refined the environmental streamlining framework.

Web-Based Search

The internet search for potential streamlining strategies and related information was guided by the use of a protocol that detailed how the search would be conducted and documented. The objective of the web-based search was to review and screen the relevant literature, awards, or recognition for rapid delivery of highway projects and other published case studies. Using these criteria, strategies and case studies were selected for more in-depth investigation. Separate searches were conducted for transportation projects and nontransportation projects.

The search protocol had an initial list of the electronic databases, metasearch engines, and library collections to be searched (see Table 1.1). Databases, search engines, and collections were added or dropped as the search progressed.

In addition, known case studies were reviewed and specific websites and web pages were targeted, including those of FHWA, the American Society of Civil Engineers, the American Association of State Highway and Transportation Officials (AASHTO), the U.S. Department of Energy's NEPA Lessons Learned Program, and others.

The protocol also specified an initial list of key search terms and Boolean operators for use in searches. Search terms were added or dropped as the search progressed, and a list of the search terms was maintained. The list of streamlining-related search terms is as diverse as the practice itself. The list of terms was expanded based on key words used within websites and documents describing streamlining.

While the research team originally assumed that the selected studies might be evenly balanced between transportation and nontransportation projects, transportation-related streamlining activities dominated the search results. As the team has found in the past, few other sectors have had such a large web presence documenting streamlining activities. Two notable exceptions include the U.S. Department of Energy's NEPA Lessons Learned Program and the

Table 1.1. Initial List of Databases, Search Engines, and Collections

Databases	AGRICOLA: USDA/NAL
	AGRICOLA: EBSCOhost
	Dissertation Abstracts: FirstSearch
	LexisNexis Academic: LexisNexis
	PapersFirst: FirstSearch
	ProceedingsFirst: FirstSearch
Search Engines	Google Scholar
	Google
	Bing
Collections	Oregon State Library
	Oregon State University Library
	Portland State University Library
	University of Oregon Library

Note: All university library collections were accessed through the Online Computer Library Center.

Streamlining the Nation's Building Regulatory Process project (*3*).

In addition to these, the team reviewed discussions and concerns reflected in the Re: NEPA discussion forum hosted by FHWA (*4*). The forum captures questions, issues, and solutions from practitioners who participate in the forum.

Review of Executive Order 13274 Efforts

Executive Order 13274 calls on executive departments and agencies to "take appropriate actions, to the extent consistent with applicable law and available resources, to promote environmental stewardship in the Nation's transportation system and expedite environmental reviews of high-priority transportation infrastructure projects." Three key actions were identified for realizing the objectives of Executive Order 13274:

1. Develop and implement administrative, policy, and procedural mechanisms to conduct environmental reviews in a timely and responsible manner;
2. Advance environmental stewardship in planning, development, and operations and maintenance; and
3. Develop a priority list of transportation projects to receive expedited agency reviews.

Implementation of Executive Order 13274 is the responsibility of the interagency Transportation Infrastructure Streamlining Task Force. This task force is responsible for both selecting the priority transportation projects and promoting the mechanisms and policies to "conduct reviews in a timely and responsible manner." To achieve these objectives, three work groups were formed by the task force to analyze the challenges associated with, and to develop recommendations for improving, aspects of project delivery associated with environmental analysis and documentation in the following areas:

- Project purpose and need;
- Indirect and cumulative impacts; and
- Integrated planning.

The work groups' findings were made in three baseline reports (*5–7*) that reflect the key issues listed in the bullet points above; these reports are briefly discussed in the next three sections.

Project Purpose and Need

The project purpose and need work group focused its analysis on determining whether the definition of project purpose and need contributes to delays in project delivery. The work group concluded that "there have been sufficient instances of problems and project delays attributed to purpose and need to frustrate applicants and agencies" (*5*). Challenges leading to delay include managing the expectations and conflicting goals of multiple participating or reviewing agencies. Agencies sometimes have different ideas about how a purpose and need statement must be developed. In practice, individual agencies may view purpose and need statements only from the perspective of their individual agency, thus creating disagreements between agencies regarding the appropriateness of the statement.

Environmental review agencies may attempt to assign a broad role for resource protection in a DOT project. Information that should be presented elsewhere, such as an individual agency's environmental protection goal, is sometimes included in the purpose and need statement. Such an inclusion, particularly when it is not the primary purpose of the project, unnecessarily complicates the statement and distracts readers from the project's true purpose.

Disagreement on how narrow or broad the statement must be causes disagreement and delay. Resource agencies sometimes perceive transportation agencies as crafting their purpose and need statement around a presumed solution to the project, rather than incorporating a broader statement that stimulates more consideration of potentially viable alternatives. Purpose and need statements are sometimes too broadly crafted and include alternatives that are unreasonable or infeasible.

While merging NEPA and Section 404 processes can be beneficial, challenges can result from the fact that NEPA purpose and need statements are usually developed before the Section 404 permitting process is initiated, thus creating the potential for the alternatives considered during Section 404 review to differ from those developed under NEPA. The different perspectives various federal agencies may bring to the development of purpose and need statements can "actually drive differences in approaches to purpose and need." Confusion and frustration can result, for example, "if a Section 404 project purpose is different from the transportation purpose of the lead agency and leads to different alternatives that may not address the key transportation needs" (*5*).

Despite the fact that a variety of agency training tools exist, the issue of how to effectively deal with "cross-agency purpose and need concerns identified by agencies and applicants" is poorly defined.

Recommendations for improving project delivery identified in the purpose and need baseline report include the need to assess how the fact that different agencies approach, scope, and interpret purpose and need differently creates conflict and affects project delivery timelines. Role clarification between transportation agencies and other engaged agencies is needed to improve the purpose and need statement development process and, when necessary, to reinforce the expectation that the transportation agency's perspective will be given deference in the event that a disagreement capable of causing long delays occurs. Interagency guidance should be

developed to address "the need for responsibly scoped, concise, and clearly written purpose and need statements" (*5*). The guidance should provide examples of acceptable purpose and need statements, and it should clarify any special considerations that may apply (e.g., the issue of the appropriateness of including economic development in the purpose and need statement depending on project specifics).

Indirect and Cumulative Impacts

The NEPA permitting process requires the evaluation of a proposed project's direct, indirect, and cumulative impacts. Indirect impacts are defined as those "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." Cumulative impacts, as defined in 40 CFR, Parts 1508.7 and 1508.8, are "the impacts on the environment [that] result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." Recognizing the common challenges of evaluating indirect and cumulative impacts that impede the environmental review of transportation projects, the indirect and cumulative impacts work group developed a baseline report that summarizes laws pertaining to indirect and cumulative impacts, identifies training programs available to help practitioners to better evaluate these impacts, and describes case studies with noteworthy practices regarding indirect and cumulative impacts (*6*). This 2005 report also presents the challenges of accounting for indirect and cumulative impacts that reduce the expediency of environmental review of transportation projects, as well as solutions for overcoming these challenges. The challenges and recommendations identified by the work group are summarized below.

Practitioners increasingly recognize the importance of identifying and accounting for indirect and cumulative impacts in preparing and reviewing environmental permitting documents. While there is a trend toward greater accounting and scrutiny in the review of transportation infrastructure projects, this increased awareness has not translated to a consistent analysis of indirect and cumulative impact assessment in environmental impact statements (EISs). Further, the work group's review of existing EISs found significant differences in the degree to which these impacts were addressed, if they were addressed at all. The work group's findings were that these areas tended to be misunderstood and/or neglected.

Based on this analysis, the work group identified several pervasive issues related to the evaluation of indirect and cumulative impacts. The analysis noted a lack of recognition of the difference between indirect impacts and cumulative impacts. In addition, there was confusion over what impacts must be analyzed and how to capture causality, especially in regard to the determination of significant impacts. A lack of rigorous analysis and confusion over analytical issues such as proper boundaries for analysis, approaches, and documentation requirements were also identified as key problems.

In addition to commenting on these challenges, practitioners at state DOTs, FHWA division offices, and research agencies provided feedback on the training and guidance currently available to address indirect and cumulative impacts. Their concerns (which are presented here as challenges) over existing guidance and training programs included the following:

- More specific guidance is needed for transportation agencies, including case studies that demonstrate examples of how indirect and cumulative impacts have been evaluated in the past.
- Federal training programs typically evaluate indirect and cumulative impacts separately, while state DOTs and FHWA tend to categorize the evaluation of these impacts together. This lack of consistency creates interagency confusion over terms and fragments existing training efforts.
- Training opportunities are not consistently available to the practitioners with the greatest needs.
- Cumulative impact assessment is the subject of several courses. However, there is a lack of information and disagreement between transportation and resource agencies in regard to the evaluation of indirect impacts.

The work group developed several recommendations for increasing agreement and coordination between transportation and resource agencies when evaluating indirect and cumulative effects. Early coordination between transportation and research agencies is critical to identifying the resources most likely to be affected by indirect and cumulative impacts and to reaching agreement on the most appropriate methodology and analysis to investigate impacts, including the establishment of a shared vision of the appropriate boundaries for analysis. The work group recommended that practitioners use geographic information systems (GISs) and transportation–land use models to better characterize the regional indirect and cumulative impacts of proposed projects. While the use of GIS and models provides information, there is considerable uncertainty in using models; as a result, review may be expedited by assembling a panel of experts who can agree on what, if any, are reasonable project impacts. While indirect and cumulative impacts are typically reviewed at the project development stage, there is a significant opportunity to improve the process by shifting the discussion of indirect and cumulative impacts to the planning stage, when it may be easier to integrate land use, transportation, and environmental planning. Another opportunity identified was local governments, which have authority over land use decisions and are in a position to help avoid or mitigate potential adverse indirect and cumulative impacts.

Applying a watershed or ecosystem-level approach to transportation planning enables practitioners to identify a watershed's most critical or high-quality resources, as opposed to focusing mitigation narrowly on the direct location of impact. In this way, applying a watershed approach allows practitioners to avoid or minimize potential adverse impacts.

Senior officials in transportation and resource agencies have the opportunity to significantly improve indirect and cumulative impact analysis by providing strategic leadership and ensuring thorough, consistent communication and training opportunities are made available to practitioners.

Integrated Planning

Transportation agencies have identified economic development, sustainability, and stewardship as objectives of the transportation system planning process. However, there is an increasing awareness that these goals are not realized without an integrated analysis and decision-making framework. To better understand the barriers to and opportunities for enhancing coordination between transportation planners and stakeholders, the integrated planning work group evaluated when and how integrated planning efforts could effectively coordinate local and state transportation system planning with efforts to conserve and protect environmental and cultural resources. The integrated planning group's baseline report defines integrated transportation planning as "a collaborative, well-coordinated decision-making process that solves the mobility and accessibility needs of communities in a manner that optimizes across multiple community goals—from economic development and community livability to environmental protection and equity" (*7*).

To develop a baseline understanding of current surface transportation planning practices, the work group surveyed practitioners to identify symptomatic obstacles to adopting an integrated planning approach. Often by the time resource agencies review transportation project plans, advance planning has already occurred. Thus, conflict between agencies over transportation plans typically occurs after significant progress toward a development plan has been made, and consequently dispute is more expensive and opportunities to mitigate environmental impacts are less efficient. Further, there is a lack of comprehensive, landscape-scale data on natural and cultural resources, and staffing and financial constraints prevent transportation planners from collaborating with the resource agency staff that will ultimately become responsible for reviewing the transportation plans.

While a few states have developed their own processes for incorporating resource agency feedback earlier in the transportation planning process, the majority of resource agencies are not involved until they are asked to review the NEPA permitting process. Resource agencies have limited staffs that are forced to balance planning activities that foster conservation and procedural responsibilities associated with planning and environmental review. The political pressure commonly associated with high-profile transportation projects places significant demands on resource staff to thoroughly review planning documents, making it less likely that they are available to participate in early planning efforts.

Each agency is driven by a different mission and operates according to unique administrative rules and regulations. The work group found that "sustained participation in integrated planning and project development processes may necessitate consolidation of expertise and re-arrangements of staff resources" (*7*). Further, there can be a lack of trust between agencies primarily responsible for safeguarding resources versus agencies fostering development. Land use planning is often driven by local processes and concerns, yet there are several financial mechanisms (including tax structures) that prevent local processes from being incorporated into landscape-scale planning processes. There is a lack of information and shared understanding between agencies of the physical characteristics and biological relationships necessary to adequately identify and mitigate impacts from transportation projects.

The work group summarized general strategies that would overcome these obstacles and result in a more integrated planning process. To foster an integrated planning approach and allow for earlier evaluation of the effects of alternative transportation solutions on environmental and cultural resources, transportation agencies must have a deeper understanding of the planning processes at resource agencies. In cases in which numerous agencies and stakeholders are involved in the transportation planning process, agency leaders must agree to a shared vision of project success. A transparent decision-making process is needed to develop solutions that reflect the diverse and sometimes contradictory goals (efficient transportation networks and preservation of environmental and cultural resources) expressed by communities. Land use planning is a critical component of human and ecological functions; therefore, local land use planning efforts must be pursued in tandem with transportation decision making. GIS and remote sensing technologies are being used in some states to compile diverse resource information, from cultural resources to endangered species habitat displays, enabling a more integrated approach to transportation planning.

Council on Environmental Quality Efforts to Expedite

The Council on Environmental Quality established a NEPA task force in 2002 to review current NEPA practices, provide recommendations to better integrate NEPA into federal agency decision making, and make the NEPA process more effective, efficient, and timely. The result of these efforts was the 2003 report *Modernizing NEPA Implementation,* which

identified actions to implement the recommendations of the task force, including guidance and several handbooks (*8*).

The report provided a comprehensive review of issues facing projects. The NEPA task force noted the importance of collaboration among federal agencies and stakeholders for efficient and effective decision making. Using suggestions from training, detailed guidance documents, and *A Citizen's Guide to the NEPA* (*9*) were noted as ways to further collaboration. The task force also identified programmatic analyses and tiering as opportunities to improve the study of cumulative effects. The report stopped short of direct guidance as this tool is very specific to implementation scenarios. The task force did call for a committee to evaluate and improve the use of these methods. The report also reviewed further areas for improvement, including managing public opinion, agency trust and credibility, and resource allocation.

AASHTO's Center for Environmental Excellence

AASHTO's Center for Environmental Excellence maintains a database that provides information on transportation project delivery and environmental streamlining mandates under federal surface transportation law (*10*). Topics in the database are designed to address the many factors that impede project delivery, both factors that are internal to transportation agencies (e.g., project priorities, staffing, funding, and communication), as well as external factors (e.g., public opposition, interagency communication, and conflicting review procedures). The database provides links to a variety of relevant research, documents, case studies, and reports completed by federal and state agencies, nongovernmental organizations, and TRB.

The AASHTO database does not provide independent key findings or study results, but rather cites the key findings of federal initiatives and task forces to identify opportunities to improve the coordination and efficiency of the environmental review process. These include

- SAFETEA-LU environmental provisions;
- FHWA and Federal Transit Administration (FTA) initiatives, including a July 1999 national environmental streamlining memorandum of understanding among the various federal agencies involved in environmental reviews for transportation projects; and
- Executive Order 13274 (Environmental Stewardship and Transportation Infrastructure Project Reviews), which established an interagency task force, chaired by the U.S. DOT and including seven other federal departments and agencies, to ensure that transportation projects are not held up unnecessarily by environmental reviews.

The database also describes the various agency programs and strategies that have been developed to address emerging issues in transportation project delivery, such as congestion relief, public–private partnerships, innovative financing, and tolling pricing programs, acknowledging that addressing these concerns will require a nontraditional approach to satisfying environmental requirements. The actions and programs described by various agencies, including programs created under SAFETEA-LU, the U.S. DOT, and FHWA, all acknowledge the trend away from local, state, and federal agencies exclusively managing the design, construction, maintenance, and operation of transportation projects toward a project approach in which the private sector is intimately involved throughout all stages of design and implementation.

In 2005 and 2006, AASHTO hosted a series of workshops on managing the NEPA process for complex projects (*11*). These workshops provided tools and methods to deliver complete NEPA documents on an acceptable schedule, with a focus on how to manage the teams involved in the review process, ways to anticipate sources of delay, and building on other planning efforts.

Review of American Recovery and Reinvestment Act Recipient Projects

Transportation projects that received funding through ARRA provided another source of potential expediting strategies and case studies. In order to receive funds through ARRA, projects had to meet aggressive schedules so that they could be ready for construction within required time frames. There was some indication that agencies applying for this funding might have employed innovative methods for expediting their projects' schedules in order to meet the time frames required by ARRA, which would provide recent case study examples.

TRB committees ADC10 (Environmental Analysis in Transportation) and ADC50 (Historic and Archaeological Preservation in Transportation) held a joint conference session devoted to the topic of "Learning from ARRA Successes in the Environmental Review Process." This session included presentations and discussions on lessons learned from meeting aggressive ARRA schedules and creative approaches to environmental review to meet the ARRA objectives. The projects discussed during this session added to the list of potential case studies for further review.

Review of FHWA Environment Document Tracking System

FHWA maintains an internal database that tracks the timeline of each EIS that the agency has published. Along with the project title and state where the project was located, this database includes dates for the publication of the notice of intent (NOI), draft EIS, final EIS, and record of decision (ROD).

The database also provides the number of months between the NOI and ROD, which is assumed to be the best available measure of the duration of the NEPA process when an EIS is prepared.

Working with FHWA, the research team used this database to identify recent projects (NOI published after January 2004) that completed an EIS process (publication of the NOI to issuance of the ROD) in less than 3 years. Project titles were also considered for indicators of projects constituting major capacity-expanding endeavors or other major actions. Nearly a dozen projects met these criteria and were selected for further research to determine whether they provided examples of successful implementation of streamlining strategies. The team contacted the identified project sponsor agencies (mostly state DOTs) or others who would know more about these projects. Based on the additional information learned, most of these projects were dropped from the list of potential expediting examples for a variety of reasons:

- Project staff indicated that the project had started as an environmental assessment (EA), but after the EA was prepared, the agency decided to prepare an EIS. The time spent initially preparing the EA (including data collection, impact analysis, and documentation) was not included in the EIS duration time but was integral to reducing the EIS duration. This was not considered an actual expediting measure, since it would increase the overall duration of project delivery.
- Project staff indicated that the EIS duration shown in the database was for a limited-scope supplemental EIS and that the total NEPA duration was considerably longer than shown. Again, this was not considered to be a strategy to achieve overall expedited delivery.
- Project staff indicated that the EIS was completed quickly because the project was very small and/or simple and probably could have been done without an EIS.

Key Findings from the Literature Review

Several of the studies and reports prepared between 1998 and 2010, together, cover a range of study methodologies and topics, including identifying the causes of delay, identifying streamlining approaches and strategies, providing case studies of expedited projects, and developing a baseline against which to measure the success of future streamlining efforts.

A 2001 streamlining study evaluated eight case studies that highlighted successful measures used to advance highway projects through the NEPA process (*12*). The eight cases were selected from FHWA's EIS timeline database, which tracks the NEPA milestones (NOI, draft EIS, final EIS, and ROD) for all FHWA EISs. The eight projects selected had completed the NEPA process (from publication of the NOI to the signing of the ROD) in 33 months or less. In all these cases, the ROD was issued between the years 1998 and 2000. The 33-month EIS process threshold was shorter than the national EIS mean duration of 3.6 years for all FHWA projects completed between 1970 and 2000. The study identified the following recurring lessons learned for successful NEPA streamlining:

- Capitalize on extensive project development and analysis performed in studies prepared prior to initiating the NEPA process;
- Initiate NEPA-type studies in advance of the formal NEPA process;
- Promote interagency coordination and cooperation via formal or informal memoranda of understanding;
- Implement early and continuous public involvement programs in an aggressive fashion;
- Pursue high-level political support for the project;
- Develop and use state-initiated streamlining programs; and
- Develop any of a variety of procedures for facilitating document preparation and review.

The streamlining study did not identify or evaluate streamlining measures or approaches. Rather, it sought to "provide a more comprehensive, less subjective, and statistically-based approach to identifying NEPA process delays and evaluating their impact on time and cost of the overall project delivery process" (*12*). This research was directly related to Section 1309 of TEA-21. The study reviewed several data sets, including the FHWA database, and randomly selected 100 FHWA EISs conducted for projects that had completed not just the NEPA process but also design and construction, and that were now operating. Statistical analysis was used to identify a set of NEPA process baselines (representing various conditions) against which to evaluate future efforts to streamline the implementation of the NEPA process. Some of the key findings and conclusions of the study regarding projects that required the preparation of an EIS under NEPA included the following:

- The typical length of time for preparing an EIS pursuant to NEPA was 3.0 years (median) or 3.6 years (mean);
- The mean time required for the entire project development process was 13.1 years;
- The NEPA process accounted for approximately 27% to 28% of the total time required for the entire project development process;
- The mean duration for preparing an EIS pursuant to NEPA increased from 2.2 years in the 1970s to 5.0 years in the 1990s; and
- Variables associated with increased duration to complete the EIS process included a required Section 404 permit, a required Section 4(f) evaluation, the number of agency meetings held, the number of public meetings held, and the presence of highway noise issues.

The statistical analysis also found that EIS completion times varied by the former FHWA region in which the project was located.

Several studies have focused on identifying the causes of project delay, or at least variables associated with project delay. In a study of 12 Oregon DOT highway projects, environmental issues such as endangered species listings, wetlands mitigation, and other factors were implicated in delays in one-third or fewer of the projects (*13*). Statistical analysis indicated that project size, scope, and complexity were associated with delays more often than were the regulatory requirements of the environmental review process. For instance, the two variables most associated with delays were design changes and concerns raised by citizens and property owners. The next three factors associated with extended project timelines were found to be communication, staffing (including turnover), and funding problems. Moreover, analysis of the actual project timelines did not show that any of the environmental process variables were related to longer overall review periods (*1, 13*). The researchers acknowledged that the available data set used in the statistical analysis was limited. Further examination of the methodology and report also indicated that there were overlapping variables, and that measuring delay was problematic. It is worth noting that the factors most associated with delay indicate that those projects were characterized by substantial controversy, had difficulty maintaining decisions, and had funding problems. These problems tend to be indicators that decisions are being made without adequate information or buy-in, that internal and possibly external communications are inadequate, and that the agency may not have made the commitments to the project that were necessary to advance the project in a timely way.

A study conducted for the Texas DOT (TxDOT) sought to develop a guidebook for streamlining the project development process at the agency (*14*). The research included questionnaires, interviews, and workshops to identify roadblocks to streamlining and to solicit successful streamlining practices. A practitioners' workshop identified the following main roadblocks:

- Lack of trust between agencies;
- Resource agencies not having vested interest in project;
- Lack of flexibility and rigid interpretation of laws;
- Too much comfort in the old ways;
- Different agency agendas and goals;
- An us versus them mentality;
- Misunderstanding of agency roles and process;
- Turnover and new staff in all agencies, and staff that lacks experience and knowledge;
- Inconsistency caused by agency staff in different districts interpreting rules differently and having different expectations (also affected by turnover) and changing priorities;
- Lack of communication:
  - Internally, on status of projects and on potential impacts, and
  - Externally, with other agencies;
- Lack of conflict-resolution procedures;
- Lack of clearly defined environmental requirements;
- Lack of empowerment of staff ready and willing to participate;
- Desire by resource agencies to know more detail before that information is available;
- Too many projects and too few full-time employees on all agencies' parts; and
- Revisiting work and decisions that have been made.

The study also identified the top eight streamlining strategies, as ranked by practitioners:

- Greater (or less restricted) access to the internet for coordinators and practitioners;
- Joint environmental education and training with participation from design staff, construction inspectors, and environmental coordinators;
- Early (and continuous) involvement of environmental coordinators on projects;
- Attendance by environmental coordinators at preliminary design and project coordination meetings;
- Environmental education for design and construction staff;
- More interaction and cooperation between TxDOT and resource agency senior management;
- More on-the-ground environmental monitoring and inspection at construction projects; and
- More programmatic agreements and programmatic permits (*14*).

Strategies and Approaches for Effectively Moving Complex Environmental Documents Through the EIS Process: A Peer Exchange Report (*15*) included selected streamlined projects from five states: Maryland's Intercounty Connector, Missouri's Paseo Bridge, Montana's I-15 Corridor and US-2, Utah's Mountain View Corridor, and several projects in Florida. The participants noted that a few streamlining tools and techniques were common to several of the projects; these identified strategies were categorized as communication, collaboration, and commitment. This peer exchange report listed 25 streamlining tools and techniques and identified the strategies used on each of the featured projects, but it provided very little detail on the strategies.

A number of studies have found that despite the normative, instrumental, and substantive arguments supporting environmental streamlining, agencies often encounter significant organizational and institutional barriers when trying to develop the collaborative relationships needed for

environmental streamlining. Constraints to collaboration and change include perceived (and in some cases real) conflicts in missions, difficulty in changing or reinterpreting policy and procedures, inadequate resources—especially budget shortfalls—and lack of appropriate interorganizational structures. Fragmentation of authority and information also has a negative influence on joint problem solving (*1, 16, 17*).

Furthermore, many well-documented strategies for environmental streamlining can incur costs without necessarily producing immediate benefits. These strategies include (*a*) early consultation among federal, state, and local government entities; (*b*) concurrent rather than sequential review of plans and projects; (*c*) stakeholder participation; and (*d*) adequate levels of information, funding, and staff for environmental review (*1, 13, 18–20*). The benefits of implementing expediting strategies are often realized in a later phase or phases of project development. For example, increased agency coordination and collaboration during early planning is likely to actually increase the labor cost and time required to complete the early planning phase. However, as the project then enters the NEPA phase and continues on to permitting, it starts those phases with better and more information, designs with lower impacts, and better relationships. The added investment in the early planning phase is likely to accrue cost and schedule benefits in the subsequent NEPA, design, and permitting phases.

In 2010, the National Cooperative Highway Research Program (NCHRP) completed a study that looked at the full project delivery process from initial conception to completion of construction (*21*). Part of the impetus for this life cycle approach was that most agencies are organized such that different divisions and staff manage different phases of project development, but there are factors affecting project delay that cross multiple phases of project delivery. The handoff from one group to another creates risk for project delay, especially when the handoff is associated with those factors that cross multiple project phases. The study was also based on the assertions that (*a*) delays arise from the way programs are structured and administered and (*b*) there are opportunities to accelerate project delivery through better organization and management of the overall delivery process. The study identified eight state DOTs that had successfully accelerated project delivery. These cases revealed trends and organizational and process issues affecting delivery and provided summary descriptions of the different accelerating strategies, techniques, and practices. Accelerating trends identified in this study include

- Performance measures;
- Front-end approach;
- Project management;
- Communication, collaboration, and cooperation;
- A team approach;
- Creative destruction and realignment;
- Organizational profile and structure;
- Regionalization; and
- Transparency.

Several of these trends are expressed in the specific expediting strategies that are described in more detail in this report.

Building from Existing Research

The literature review, web-based search, and review of other sources revealed that specific aspects of project expediting have been well documented, while others have only limited coverage in the existing pool of studies. The following topics have been addressed in multiple studies, and these findings are relatively well documented:

- The causes of project delay;
- General principles and approaches to expediting delivery of transportation projects (e.g., collaboration has been widely identified as an expediting principle and general approach);
- Detailed case studies (most existing reports include detailed descriptions of the projects that have been successfully expedited); and
- Identification of specific strategies for expediting (a reasonably large number of strategies have been identified, but much less has been done to describe or evaluate the strategies).

Information that is relatively limited in the existing literature includes

- Descriptions of specific expediting strategies and tools. While the general approach of collaboration has been widely identified as helpful to expediting, there is limited information on specific strategies for implementing collaborative techniques aimed at expediting specific tasks.
- Evaluations of specific expediting strategies. Little information is available on the risks, costs, benefits, applicability, and other factors associated with specific strategies.
- Transferability of strategies. Information is lacking on how the strategies may or may not apply to various types of projects, programs, or agencies, and on what should be considered when trying to transfer the strategy to another location or situation.
- Accessibility of useful information. Much of the information is contained in lengthy reports that may not be readily accessible.

These findings led the project team to make slight revisions to the research work plan in order to avoid duplicating existing

studies and to build on, and fill gaps in, the existing body of knowledge about project expediting. The revised work plan was similar to the original but placed more emphasis on evaluating, rather than merely identifying, streamlining strategies and constraints. The final work plan was intended to accomplish the following:

- Confirm (or identify) and evaluate constraints to project expediting as they relate to the specific streamlining strategies;
- Keep case studies succinct and focused (i.e., minimize repeating lengthy, existing case study descriptions);
- Focus on the expediting strategies;
- Provide descriptions of specific strategies;
- Evaluate each strategy;
- Include nontransportation examples when appropriate; and
- Present information on strategies and constraints so that it will be accessible and useful to practitioners.

Constraints to Expediting

Studies vary in how they identify, describe, and label the causes of project delay. There is also some debate about what actually causes delay versus what is a symptom or indicator of project delay. This study does not attempt to differentiate causes from symptoms, choosing instead to identify constraints to expediting. It further describes indicators (both leading and lagging) that can allow practitioners to identify when a project is likely to experience, or is already experiencing, a given constraint to expedited delivery.

The primary intent of identifying constraints in this study is to allow practitioners to link the constraints to the specific expediting strategies and tools. From the practitioner's point of view, whether the constraints are labeled as causes or symptoms is less important than being able to identify the specific strategies and tools that can be used to overcome or reduce a given constraint.

Case Studies

The review of past expediting research indicated that little information has been provided on the specific strategies used to expedite projects. In addition, members of the SHRP 2 Capacity Technical Coordinating Committee and the expert review group for this project suggested that this study should put greater focus on the expediting strategies and less focus on detailed case studies. As a result, this report includes fewer and shorter descriptions of case studies and focuses more on the expediting strategies. Sources that provide detailed descriptions of projects (cases) are cited but not discussed in detail; however, when existing case study write-ups do not capture the particular streamlining strategies studied in this report, related case study information is included.

Expediting Strategies

As noted above, this study focuses on describing and evaluating specific expediting strategies. Most previous studies on expediting have focused on projects or programs that were comprehensively expedited. Project C19 includes those types of projects, as well as projects that may have expedited just one phase or one aspect of project delivery. This allowed the scope of the study to include a wider range of expediting strategies. For example, a given project may have developed a strategy for expediting internal decision making but did little to expedite permitting, and therefore the overall project experienced delays. Regardless of how the project performed in other areas, if it employed a strategy that effectively expedited a particular phase or constraint, that strategy was included in this report.

This report describes 24 strategies for expediting project delivery and evaluates those strategies for schedule implications, costs, risks, other benefits, applicability, and transferability. Each strategy is linked to the specific constraint(s) that it addresses, to the project phase and decision points when it can be used, and to one or more specific project examples for which it has been successfully implemented.

Making the Information Useful to Practitioners

Accessibility in the present report is partially achieved by presenting the information about each of the constraints and mitigation strategies in standardized formats (see Chapter 2). These formats describe the key information relevant to a practitioner. They also include hyperlinks to more information about the strategies, related case studies, and other information that may be useful for implementing the strategy but is not necessary for understanding and selecting an appropriate strategy. The greatest accessibility will be realized as the information and findings are incorporated into SHRP 2's capacity-focused website (*22*). At the time this report was written, this integration was set to occur in late 2010.

Selection of Strategies and Case Studies

From the research described above, the research team identified a long list of potential case studies for further evaluation to determine which projects would provide the most useful cross-section of strategies. Individuals were contacted who worked in key functions (such as project manager or environmental manager) on these projects to determine if they felt there were specific tools or approaches that helped to

expedite the project. These initial phone conversations were informal and focused on determining key factors that helped the project succeed or assisted in expediting a particular phase or element of project delivery.

Using the information gleaned from the research and from these initial conversations with project staff, the team selected projects for case studies to illustrate the use of specific strategies. The most important factor in selecting the projects was the initial determination, based on the research and initial phone conversations, of whether a project appeared to have successfully employed a specific technique or approach (strategy) to either proactively avoid or minimize potential delay or to address a source of delay.

Of course, determination could not be fully informed until the research team had committed to and conducted the full interviews described below. Consequently, the selection of case studies included consideration of other criteria gathered during the research; these other criteria are also described below. No formal ranking or rating was used to select these projects.

Geographic Breadth

Ideally, projects would not be clustered in a certain region, but spread throughout the country. The web search and literature review included a variety of international sources, but the recognition and study of methods explicitly designed to streamline project delivery are domestic. At least one was modeled after a strategy first used in Europe.

Contemporaneity

Regulations, and in particular, agencies' policies for compliance techniques, change rapidly. Coupled with an ever-growing understanding of how human actions affect the environment, the research team wanted to pick projects that occurred relatively recently and to include a few projects that were very recent—within the last year.

Breadth of Function

The following broad functions helped the team to categorize the likely strategies that could be illustrated from the potential case studies:

- Internal communication and organization;
- External coordination and communication;
- Commitments;
- Analysis; and
- Decision making.

By selecting case studies and strategies in each of these functional categories, rather than focusing on a small set of elements of project development, the results of this study should be more broadly useful to a wider range of practitioners.

Effectiveness

To help gauge the merit of case studies and the strategies they were likely to yield, the team considered several types of effects, both beneficial and detrimental, that could be expected from the strategies. These include

- Schedule implications. How a strategy affects project schedules is of course the most important consideration for this study. Many best practices can be culled from projects that are not directly relevant to expediting, and at this preliminary phase it helped to double check that the case study and strategy would provide a practice that directly addressed the ability to maintain or accelerate at least one element of project delivery and contribute to the overall expediting of a project's schedule.
- Cost. The monetary cost to implement a strategy, as well as the potential cost savings, was also something the research team wanted to be able to address, albeit qualitatively.
- Risks. Many times, innovative approaches to expediting carry risks, either that the intended benefit will not be realized or (and often equally important) that ancillary effects will occur that may not be immediately linked to implementing the strategy. During selection, the team wanted to be sure that potential risks that were considered and/or experienced by the project could be discussed for each case study.
- Applicability. An important consideration in selecting the case studies was how broadly applicable they would be for practitioners' projects. Solutions to unique or very rare problems were generally avoided.

As noted above, the research team did not discriminate between whether the overall project was expedited or whether only some aspects of the project were expedited. The most important factor was evidence that an expediting strategy helped the project to progress faster or to avoid or minimize delay. This analysis approach also favored cases that required an EIS and not some other class of action. With a focus on projects that add capacity to the highway network, the assumption was made that cases with NEPA expediting strategies would primarily be ones requiring an EIS due to the nature of the projects.

Interviews

Data for each case study were collected through a review of secondary documentation and through purposive, semi-structured interviews. Before conducting the interviews, the

research team thoroughly examined information available on websites associated with the selected cases. Using public records and personal knowledge of the cases, the team developed an initial interview contact list. Initial interviewees were known to be transportation practitioners, state and federal natural resource agency employees, contractors, consultants, and/or other stakeholders from the selected case study projects. This population was targeted because of their unique ability to identify and discuss the streamlining activities in the context of the selected case study projects. Interviewees were offered an opportunity to identify alternative or additional potential interviewees knowledgeable about the case in question, and they were asked to provide any applicable reports and related information that the team had not been able to obtain during its preliminary research.

An inductive approach was taken by conducting semistructured interviews using open-ended questions. The development of the interview guide was an iterative process as the research team attempted to focus on the most essential questions while creating the least inconvenience for DOT interviewees. The intent of the guide was to solicit specific information about streamlining activities by describing their uses, advantages, disadvantages, applicability, and implementation in the context of planning through final design. Interview questions were roughly grouped into three categories: (*a*) questions related to challenges in project delivery, (*b*) questions about how these project delivery challenges and project-specific challenges were addressed with specific streamlining activities, and (*c*) questions about the transferability and applicability of the streamlining activities to future projects and operational procedures within the interviewee's agency. Since the selected cases and their streamlining activities covered a broad range of scenarios, from single-project expediting initiatives to nationally based ones, not all questions were appropriate for all cases. Extensive information about projects for which the streamlining activities were implemented was not elicited in the interview; rather, the researchers relied on web-based information as a means of initially choosing projects as case studies, and asked the interviewees to point the team to any additional sources of information about the project as a whole.

Most interviews were conducted between March and July 2010. They were conducted by phone and lasted approximately 1 to 1.5 hours, although in some cases interviews went longer. Written notes were taken and were reviewed both for technical information and for patterns in responses that indicated critical factors influencing expedited project delivery. Confidentiality is essential to this type of research to ensure that interviewees freely express opinions and observations. When direct quotations are used, any language that might identify the individual making the statement has been removed.

Two limitations must be noted with regard to the research design and methodology. First, it was important that the interviewees had both broad and deep knowledge of the specific case and the expediting tools used. The sample was therefore purposive rather than random. As a result, interviewees were not neutral observers regarding the case itself. Bias beyond responses to questions about technical procedures likely exists. Second, the results are not generalizable; however, generalizability is not the objective of qualitative research. Rather, such research provides the potential to extrapolate results, in whole or in part, to similar contexts. These are precisely the objectives of this project and report: first, to add to the understanding of streamlining (expedited delivery) by describing the uses, advantages, disadvantages, applicability, and implementation requirements of expediting strategies in the context of planning through design; and second, to describe the application and utility of these expediting strategies so that DOTs can use them.

Evaluation of Streamlining Strategies

Projects included in this study are ones that were identified as successes in expedited delivery, at least during the phases that were evaluated. Initial review of the case studies identified the challenge of developing a common unit of analysis across the cases. The varying regulatory settings, project histories, and agency practices made finding a common denominator difficult. The project team chose a constraint-based model as the best method of analysis across all of the case studies. This model relies on distilling a common set of constraints and using these to identify indicators and organize the expediting strategies. This model also provides better opportunities to make the information gathered here transferable to future projects, as a constraint model captures common issues faced by transportation projects.

The first step in the review was the identification of expediting strategies from the case studies. The raw case study information was developed into specific expediting strategies. Chapter 3 provides the individual strategy profiles and details the implementation of the strategy, the constraints it addresses, and specific references to projects that have successfully employed the strategy. The entries in Chapter 3 were designed as stand-alone guides for practitioners to use as references as future projects are planned or managed.

For each expediting strategy, a list of constraint factors was developed. Many of the constraints were initially project specific, based on the local set of issues or on the actors involved. To develop a more comprehensive view, these constraints were grouped into common sources of delay. The constraints related to common sources of delay were identified from the case studies examined and are discussed in Chapter 2. Each

constraint was investigated to identify the leading and lagging indicators of its presence and measures of severity. Indicators are the project characteristics, events, stakeholder comments, or problems encountered that indicate the constraint may be present. To assist practitioners in assessing their own projects' potential constraints, the indicators were developed to form a questionnaire for self-diagnosis.

Next, each constraint was refined with specific measures of severity from low to high. Severity was based on an examination of the case studies, literature, and the experience of the research team. In many cases, severity was captured in qualitative measures; however, when possible, quantitative measures were also included. For example, severity is captured in measures of stakeholder opposition, numbers of issues raised in opposition, length of delays, and other similar measures. This analysis allows for the constraints to be understood across the diverse set of projects examined in this study and to be more broadly useful for practitioners. Like the indicators, the measures of severity are designed to be readily incorporated into a questionnaire format for studying future transportation projects.

Finally, expediting strategies were identified that can help to address each constraint at the differing levels of severity. Some strategies apply only to certain levels of severity or must be implemented before a project starts in order to be effective. For example, programmatic agreements may expedite delivery, but they require preproject development and implementation and are recommended only for larger projects or programs that can expect to encounter constraints with more severe implications. These considerations are captured in each of the constraint analyses presented in Chapter 3.

Throughout the development of this methodology, the goal has been to provide information on expediting strategies that can be included in a user-based product such as the Transportation for Communities: Advancing Projects through Partnerships (TCAPP) website (*22*). The project team coordinated with the Capacity Project C01 team to identify opportunities for this product to be integrated in a way similar to the collaborative assessment tool on the TCAPP website. A web-based questionnaire can be adapted based on the constraint-based model employed in this study. The constraint indicators and severity measures provide the basis for a guided survey for users to diagnose potential and existing constraints and to identify appropriate expediting measures. After this self-diagnosis, users can follow up by reviewing the detailed strategy profiles and case studies that document implementation.

This evaluation structure is followed in the form of this report. Chapter 2 provides the diagnostic tools for identifying and assessing constraints and their severity. Chapter 3 follows by providing detailed strategies to respond to constraints, and Chapter 4 provides concise case studies showing implementation of these strategies.

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CHAPTER 2

Common Constraints to Transportation Project Delivery

This chapter documents the general types of constraints addressed by the strategies described in Chapter 3. As described in Chapter 1, the evaluation portion of this study used a constraint-based model to analyze the effectiveness of the strategies identified in the case studies. From the specific constraints addressed by the case studies, a list of 16 general constraints was developed that are more broadly applicable for practitioners attempting to diagnose and solve problems.

The following sections discuss the 16 generalized constraints. Under each heading is a brief description of the constraint followed by a list of potential indicators that this problem may occur during a planned project (a leading indicator) or that it may already be occurring (a lagging indicator). Practitioners considering or beginning a project should look at the leading indicators to determine potential constraints they might encounter; the lagging indicators are useful for diagnosing constraints that might be delaying an existing project.

Below the list of indicators for each constraint is a table that describes (*a*) the likely effects from the manifestation of the constraint at different severities and (*b*) the strategies that may help to prevent or address the constraint at each degree of severity. Most tables show three levels of severity (low, medium, and high). For some constraints, providing a medium-severity category is not useful. Depending on the nature of the qualitative measures, and when the measures of severity for such constraints are particularly subjective, the accompanying tables provide only low and high levels of severity.

Each section concludes with a brief description of how the strategies apply to the constraint.

It is worth noting that the risk management strategy is applicable to nearly all constraints as it helps agencies to anticipate potential constraints before they arise. This enables project teams to implement strategies to avoid the constraint or proactively address it before it causes delay. Risk management is not listed under each constraint below but is described in greater detail in Chapter 3.

Constraint 1: Avoiding Policy Decisions Through Continual Analysis

Projects can be delayed or stopped as continual requests for further analysis come in from team members or stakeholders. Sometimes this is a request to reanalyze data already available or to consider something new. Often these requests are seen as ways to settle decisions through an analytical route as opposed to a political one. Sometimes the requests are a way to avoid the needed policy decision that may require a trade-off or settling of concerns. Such requests can indicate an unwillingness to support or agree on project issues, with increased focus on analysis intended to reduce the risk associated with making a bad decision or to derail or delay moving on.

Indications that this constraint may occur or has already occurred include

- Leading
  - Difficult or new policy decisions will need to be made.
- Lagging
  - There are repeated requests to generate more detailed analysis;
  - There are requests to invite outside experts for additional review of analysis; or
  - Analysis requires new models or new data sets.

Table 2.1 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address this constraint at each degree of severity.

Application of Strategies

Consolidated Decision Council

A decision council can provide the authority for addressing policy issues that technical staff can rely on.

Table 2.1. Constraint 1: Effects and Mitigation Strategies

	Severity		
	Low	**Medium**	**High**
Effects	• One issue is requested to be reviewed with new data or analysis that was not anticipated • Limited to one type of issue or resource	• Technical analyses might be broadening analysis outside the scope needed for the project analysis (e.g., cumulative effects are being considered that are unforeseeable)	• Calls for high-effort analysis coming from multiple parties • Multiple issues are presented for reanalysis or have new data collected that were not anticipated • Analytical methods have not been used in the region or in the agency • Analyses try to capture entire systems at the project level or proposed analysis of factors that project cannot address or affect
Mitigation strategies	• Consolidated decision council • Regional environmental analysis framework • Expedited internal review and decision making	• Consolidated decision council • Regional environmental analysis framework • Expedited internal review and decision making • Dispute-resolution process • Programmatic permitting	• Consolidated decision council • Regional environmental analysis framework • Expedited internal review and decision making • Dispute-resolution process • Programmatic permitting • Up-front environmental commitments

Dispute-Resolution Process

A dispute-resolution process can define how to take policy questions out of the technical realm and resolve them at the appropriate level.

Programmatic Permitting

Programmatic permitting based on preproject considerations of resource issues and impacts allows policy decisions to be settled before the project begins. If the assumptions of the programmatic permits are challenged on technical grounds, there is a clear path to deciding whether this is truly a technical concern or an attempt to change policy.

Regional Environmental Analysis Framework

When the regional environmental policy and technical resources are set in a framework, the rules are defined for considering data and impacts at the project level. This creates a clear distinction between policy and technical issues.

Expedited Internal Review and Decision Making

Establishing commitments from agencies to expedite decision making can avoid protracted analysis and discussion surrounding potentially difficult policy decisions.

Up-Front Environmental Commitments

Commitments can resolve policy and technical issues by agreeing early on to a higher standard of mitigation. This strategy relies on identifying key resources of concern and committing to a high-level restoration, protection, or some form of enhancement. The commitment can be made by including the action in the project's purpose and need statement or by specifying it in the draft EIS (DEIS) or the final EIS (FEIS).

Constraint 2: Conflicting Resource Values

As DOTs work with resource agencies to evaluate potential effects on the environment, differing opinions and understandings about the value, extent, and location of natural and cultural resources can hamper progress. Such differences can occur if the agencies have each undertaken separate resource inventories at different times and using different techniques, or they can result from a simple perceived or real conflict in protecting the different resources under the jurisdictions of different agencies. These differences can cause misunderstandings, create debate, and require project-specific inventories rather than relying on more efficient regional surveys. Cumulative effects analyses can be especially challenging when assessing past impacts that were made with different assumptions and used different methodologies.

Indications that this constraint may occur or has already occurred include

- Leading
  - DOT embarks on a resource survey with little or no coordination with applicable resource agencies; or

  - Multiple data sets exist across different agencies for the same resource(s).
- Lagging
  - Resource agencies or stakeholder groups question analysis based on the data employed;
  - Past analyses of impacts have produced different, incongruous data; or
  - Past impacts to the resource have not been well documented or evaluated.

Table 2.2 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Application of Strategies

Regional Environmental Analysis Framework

This strategy provides a common understanding for multiple agencies with shared concerns or differing interests in natural and cultural resources. Developing this common understanding, particularly on a larger regional scale, can help to address some of the data and analytical challenges of major projects.

Facilitation to Align Expectations Up Front

Facilitated meetings with resource agencies and stakeholder groups during the early phases of project development can identify discrepancies between parties and allow DOTs to address them before undertaking analysis using data or methods that would later be questioned.

Planning-Level Environmental Screening Criteria and Leverage Planning During NEPA

Incorporating environmental factors during planning-level screening can help to provide agencies with a broad understanding of how potential projects may affect natural and cultural resources. When planning considers environmental factors, it can more easily be leveraged during subsequent NEPA phases for individual projects to help avoid conflicting assumptions and understandings among different agencies and stakeholder groups.

Coordinated and Responsive Agency Involvement

Working closely with resource agencies can help all parties involved to agree on resource values and other data that underpin environmental analyses. This strategy will also help

Table 2.2. Constraint 2: Effects and Mitigation Strategies

	Severity		
	Low	**Medium**	**High**
Effects	• Rework or additional analysis required because agencies or stakeholder groups request the use of different data about resource locations/quality; this can be accommodated with little effect on the overall project schedule.	• Rework or additional analysis required because agencies or stakeholder groups request the use of different data about resource locations/quality; the magnitude of additional work delays subsequent tasks, but milestone dates are maintained.	• Rework or additional analysis required because agencies or stakeholder groups request the use of different data about resource locations/quality; the magnitude of this work delays achievement of milestone dates. • Agreements or approvals denied or delayed based on disagreements over data relied on for impact assessments or for mitigation design. • New or different alternatives required based on faulty understanding of resource locations/quality.
Mitigation strategies	• Regional environmental analysis framework • Facilitation to align expectations up front • Planning-level environmental screening criteria • Leverage planning during NEPA • Coordinated and responsive agency involvement	• Regional environmental analysis framework • Facilitation to align expectations up front • Planning-level environmental screening criteria • Leverage planning during NEPA • Coordinated and responsive agency involvement • Dispute-resolution process	• Regional environmental analysis framework • Facilitation to align expectations up front • Planning-level environmental screening criteria • Leverage planning during NEPA • Coordinated and responsive agency involvement • Dispute-resolution process • Up-front environmental commitments irrespective of impacts

Note: NEPA = National Environmental Policy Act.

to identify potentially conflicting assumptions earlier, when they are more easily addressed.

Dispute-Resolution Process

A formal approach for resolving disagreements with resource agencies may be helpful if disputes between agencies regarding data or analysis cannot be readily resolved among the working parties.

Up-Front Environmental Commitments Irrespective of Impacts

A significant environmental commitment made early in project development, regardless of what impacts are later determined during evaluation, can go a long way toward alleviating concerns from resource agencies and stakeholders worried about a project's potential impact to their resource interests and make them less likely to request new data collection or analysis.

Constraint 3: Difficulty Agreeing on Impacts and Mitigation

The process of identifying and developing agreement on the nature and scope of environmental impacts and negotiating and designing mitigation can be challenging and is a frequent source of delay for projects. Debate or disagreement over mitigation decisions can delay overall project progress because it typically occurs late during the NEPA phase and is often on the critical path.

Indications that this constraint may occur or has already occurred include

- Leading
  - Project has diverse and/or significant impacts;
  - New or different resources are present (e.g., new listed species); or
  - New or changing regulations concerning environmental resources are present.
- Lagging
  - Project is drawing criticism from stakeholder groups over impacts;
  - Initial identification of impacts is challenging and requires more time than initially planned; or
  - Initial identification on appropriate type and/or extent of mitigation is challenging and requires more time than initially planned.

Table 2.3 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Table 2.3. Constraint 3: Effects and Mitigation Strategies

	Severity		
	Low	**Medium**	**High**
Effects	• Analysis of impacts and development of mitigation are taking longer, but are unlikely to delay overall project schedule • Disagreement about appropriate analytical methods or accounting techniques • One or two resources involved for mitigation considerations	• Disagreements over impacts are leading to disagreements about the project's NEPA classification (e.g., dispute over a finding of no significant impact [FONSI]) • Impacts are leading to an Endangered Species Act (ESA) determination of incidental take	• Analysis of impacts and development of mitigation are delaying overall project schedule • Fundamental disagreement over type or magnitude of impacts and/or whether mitigation is necessary • Several different resources, including some that may compete, are involved in the project's impacts and mitigation designs • Disagreements over impacts are leading to disagreements about the project's ESA determination (e.g., jeopardy)
Mitigation strategies	• Facilitation to align expectations up front • Planning and environmental linkages • Planning-level environmental screening criteria • Coordinated and responsive agency involvement	• Facilitation to align expectations up front • Planning and environmental linkages • Planning-level environmental screening criteria • Coordinated and responsive agency involvement • Up-front environmental commitments • Programmatic permitting • Regional environmental analysis framework	• Facilitation to align expectations up front • Planning and environmental linkages • Planning-level environmental screening criteria • Coordinated and responsive agency involvement • Up-front environmental commitments • Programmatic permitting • Regional environmental analysis framework • Interagency dispute-resolution process • DOT-funded resource agency liaisons

Application of Strategies

Facilitation to Align Expectations Up Front

Early facilitation allows for issues, concerns, and values to be clearly identified before conflict arises. These issues can then be addressed before reaching agreement becomes difficult. Facilitation also allows for working relationships to develop, helping parties to understand what is necessary for a successful decision.

Planning and Environmental Linkages

Referencing work done during prior planning studies, rather than redeveloping it, can make building consensus on impacts and mitigation simpler and potentially less contentious if the planning work involved agencies and stakeholders engaged during NEPA.

Planning-Level Environmental Screening Criteria

Consideration of environmental factors during planning studies can streamline the evaluation of impacts during the NEPA phase and expedite agreement with resource agencies and stakeholder groups.

Coordinated and Responsive Agency Involvement

Collaboration with resource agencies early and continually during project development can help all parties to develop a mutual understanding of the resources in the project area and the analytical techniques for assessing how the project could affect these resources.

Interagency Dispute-Resolution Process

Developing a clear process for handling disputes within a decision-making process allows any issues that arise to be handled swiftly. A dispute-resolution process can also outline when it is and is not acceptable to revisit a decision.

Programmatic Permitting

Programmatic permitting based on preproject considerations of resource issues and impacts allows for project-level decisions to be governed by a larger agreement. This both expedites decision making and prevents agreements from falling apart.

Regional Environmental Analysis Framework

The development of an analysis framework allows for key critical decisions on impact calculations and mitigation options to be discussed in the context of the watershed or relevant ecosystem. This approach allows for consideration of cumulative impacts and provides the basis for rapid project-level impact calculations and mitigation decisions.

Up-Front Environmental Commitments

In some cases, substantial early commitments regarding environmental resources can prevent disagreement on the impacts or mitigation. This strategy often relies on identifying key resources of concern and committing to restoration, protection, or some form of enhancement. The commitment can be made by including the action in the project's purpose and need statement or by specifying it in the DEIS or FEIS.

DOT-Funded Resource Agency Liaisons

Resource agency staff dedicated to working with the transportation agency can help both agencies to develop a common understanding on the location and value of resources and agreed-on techniques for assessing impacts to these resources. Funding these positions is rarely project specific, and typically done to develop these interagency agreements to benefit most transportation projects.

Constraint 4: Inability to Maintain Agreement

Changing or reopening decisions lengthens schedules and delays progress. For project expediting, decisions should be maintained across the parties and over time. While many decisions evolve and shift, sometimes agreements can deteriorate or not be reliable for reasons that could be actively managed and avoided. The most challenging situation occurs when a decision is revisited repeatedly, changed, ignored, or contested after agreement has been reached. For example, decisions made during a planning study, such as corridor plans, are vulnerable during subsequent NEPA phases for individual projects as new agencies are involved.

Indications that this constraint may occur or has already occurred include

- Leading
  - Undefined structure and process for decision making at the outset;
  - No clear champion, convener, or proponent;
  - Multiple agencies leading the project;
  - Complex, diverse set of parties;
  - Assigned staff not empowered to make decisions;
  - Questions about whether an issue is settled or how it was settled;
  - Changing representatives or staff;
  - Agreements and commitments not being documented;
  - Planning process that narrows alternatives for subsequent projects does not involve coordination with applicable federal agencies; or

  - Decisions with significant influence on future work made without written agreements or commitments from agencies with future decision-making authority or strong influence over the project.
- Lagging
  - Changing project scope (may indicate decision was premature);
  - As NEPA process begins, prior planning evaluations are redone to develop a range of alternatives;
  - Different interpretation of agreements or what a decision meant;
  - Changes in decisions causing work to stop;
  - Range of alternatives changes; or
  - Changes in representatives or staff.

Table 2.4 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Application of Strategies

Consolidated Decision Council

Establishing a council of high-level staff from multiple agencies involved on a project can help to ensure that decisions made by these parties are adhered to and are more reliable.

DOT-Funded Liaisons

For DOTs with a consistent need for decision making or review by resource agencies, liaisons offer an opportunity to make sure that staff time is dedicated to facilitate decision making. Liaisons can provide a constant conduit back to the agency providing information and can build trust as decisions are made. This also requires that liaisons are empowered by their regulatory agency to hold the agreement on the agency's behalf.

Table 2.4. Constraint 4: Effects and Mitigation Strategies

	Severity		
	Low	**Medium**	**High**
Effects	• Single decisions difficult to maintain (one-time issue) • Disagreements are primarily over technical issues • Technical champions or experts missing • Involves lower-level decision makers (frontline staff or reviewers) • Revisiting a prior decision adds time as the process is replayed, but the outcome is substantively similar, requiring little or no additional analysis • Minor design decisions are revisited and changed	• Problems thought to be technical are actually policy • Trying to use more science or more data to hold the decision together • Involves midlevel participants from their organizations	• Endless loop of decisions being made and revisited multiple times without progress • Persistent across many different decisions and topics • Interpersonal conflicts become part of the problem • Issues are more philosophical than technical • Higher-level decision makers have a hard time committing • A major decision is revisited and changed (e.g., the range of alternatives to be considered), stalling progress and then requiring additional design and evaluation • Decisions are continually revisited, preventing progress to the next milestone
Mitigation strategies	• Consolidated decision council • Highly responsive public engagement • Strategic oversight • Aligning expectations up front • Interagency dispute-resolution process • Coordinated and responsive agency involvement • Planning and environmental linkages • Tiered NEPA process • Planning-level environmental screening criteria • Change-control practices • Real-time collaborative interagency reviews	• Consolidated decision council • Highly responsive public engagement • Strategic oversight • Aligning expectations up front • Interagency dispute-resolution process • Coordinated and responsive agency involvement • Planning and environmental linkages • Programmatic permitting • DOT-funded resource agency liaisons • Early commitment of construction funding	• Consolidated decision council • Highly responsive public engagement • Strategic oversight • Aligning expectations up front • Interagency dispute-resolution process • Planning and environmental linkages • Programmatic permitting • Tiered NEPA process • Planning-level environmental screening criteria • Change-control practices • Early commitment of construction funding

Facilitation to Align Expectations Up Front

Early facilitation allows for issues, concerns, and values to be clearly identified before conflict arises. These issues can then be addressed before agreements become difficult. Facilitation also allows for working relationships to develop, helping parties to understand what is necessary for a successful decision.

Highly Responsive Public Engagement

By thoroughly addressing the public's concerns, parties to agreements can feel safer that their positions are in line with public opinion. This is particularly important for appointed or elected decision makers.

Interagency Dispute-Resolution Process

By developing a clear process for handling disputes within a decision-making process, any issues that arise can be handled swiftly. Additionally, a dispute-resolution process can also outline when it is and is not acceptable to revisit a decision.

Coordinated and Responsive Agency Involvement

Consistently involving resource agencies during project development and at decision points can keep them engaged in a project and avoid staff turnover and loss of understanding about prior agreements.

Planning and Environmental Linkages

Using decisions and agreements forged during planning once NEPA has begun can be more effective and efficient than recreating similar decisions. Of course, this requires that the planning process is structured in a manner that produces results and decisions that are reliable in NEPA.

Programmatic Permitting

Programmatic permitting based on preproject considerations of resource issues and impacts allows for decisions at the project level to be governed and guided by a larger agreement. This both expedites decision making and reduces the risk that project-level decisions based on those programmatic agreements will fall apart.

Strategic Oversight and Rapid Assessment

Through identification of decision points, decision makers, issues, and resources early on, decision making can be more effective at the project level. This strategy focuses on developing a management plan for decision making either before the project begins or at the very beginning of the project. In this context, strategic oversight can be scaled to meet various project needs.

Early Commitment of Construction Funding

This can provide projects with momentum and add pressure to agencies and stakeholders to abide by existing agreements to maintain progress toward construction.

Constraint 5: Ineffective Internal Communication

Quick, easy communication within a project team is vital for rapid progress, but it is often difficult for project managers and agencies to define and achieve. As project teams grow in size and complexity, so does the need for strong internal communication. This ensures everyone understands priorities, new decisions, and changing directions and that everyone is working with the latest data. Hindrances to internal project communication can disrupt or delay discussions and decisions that are necessary to maintain project momentum.

Indications that this constraint may occur or has already occurred include

- Leading
  - Large project team;
  - Complex project team (high mix of disciplines and/or agencies involved in the project team);
  - Geographically disparate work locations for project team members; or
  - Transition in project phase that results in gradual project team turnover (e.g., transition from planning to NEPA).
- Lagging
  - Project staff are working on out-of-date data or assumptions;
  - Staff complain that they are the last to know important information;
  - Decisions are revisited or delayed because some staff were not brought into the discussion initially; or
  - Internal communication is rarely as simple or easy as walking down the hall to have a casual conversation.

Table 2.5 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Table 2.5. Constraint 5: Effects and Mitigation Strategies

	Severity		
	Low	**Medium**	**High**
Effects	• Multiple agencies are staffing the project, but these agencies have worked together successfully before • Internal communication seems cumbersome or time consuming, but is generally effective • Internal communication often requires scheduling meetings, and cannot often be done less formally. However, meetings are typically easy to schedule and are effective • Work needs to be redone because staff used out-of-date assumptions or data, but with little effect on the project schedule	• Internal communication consistently requires more formal gatherings to discuss information about the project and maintain progress • Work needs to be redone because staff used out-of-date assumptions or data, causing ancillary effects on the project team's morale	• A project is being sponsored by multiple agencies with little experience working together and/or with substantially different mission statements and policies • Decisions must be revisited because some project staff were not properly involved in the initial decision making • Work needs to be redone because staff used out-of-date assumptions or data, causing the project to miss key milestone dates
Mitigation strategies	• Strategic oversight, readiness assessment • Real-time collaborative interagency reviews • Expedited internal review and decision making	• Strategic oversight, readiness assessment • Real-time collaborative interagency reviews • Expedited internal review and decision making • Consolidated decision council • Team co-location	• Strategic oversight, readiness assessment • Real-time collaborative interagency reviews • Expedited internal review and decision making • Consolidated decision council • Team co-location

Application of Strategies

Strategic Oversight and Readiness Assessment

This technique is designed to assess staffing requirements from multiple agencies and to install a single, cohesive system of project management protocols for finances, schedule, and oversight. Aligning staff from multiple agencies and providing a common system of project management can streamline internal communication and coordination.

Real-Time Collaborative Interagency Reviews

Interagency reviews can be complicated when done separately in a sequence of review–revision cycles. Real-time reviews among several agencies can reduce the communication and coordination required to reconcile comments from different reviewers.

Expedited Internal Review and Decision Making

Expediting applications such as internal review and decision making establishes commitments from agencies and staff on a project for the protocols and time frames for these activities. Up-front agreement on this process can improve internal communication and coordination and avoid misunderstanding among different parties.

Consolidated Decision Council

A consolidated decision council can simplify the decision-making processes of complex projects by reducing the management structure that may otherwise form organically when multiple agencies are leading or participating in project development.

Team Co-location

Having the team in one location can improve internal communication and decision making on projects with diverse teams consisting of different agencies and consultants who would otherwise be working from multiple, disparate offices.

Constraint 6: Inefficient Section 106 Consultation With State Historic Preservation Officer

Most DOT projects and activities have little or no potential to affect historic or archaeological resources, but they are nonetheless often subject to project-by-project review from the state historic preservation officer (SHPO). These reviews can add time and expense to these projects and sap resources that might otherwise be better spent on projects with more

likelihood of affecting resources protected by Section 106. The traditional approach of individually submitting most DOT projects and activities to SHPO for review and comment is generally inefficient. This approach may ultimately inhibit agencies from providing the appropriate resources on projects that do pose concern for historic and archaeological resources.

Indications that this constraint may occur or has already occurred include

- Leading
  - Lack of programmatic agreement among the transportation agency, applicable federal agencies (e.g., FHWA or FTA), and SHPO that defines certain types of projects and activities that are categorically excluded from individual review and coordination with SHPO.
- Lagging
  - Projects with almost no likelihood of affecting Section 106 resources take additional time and expense because of the need to submit information for review by SHPO; or
  - SHPO staff are overwhelmed or stretched thinly across the transportation projects they must review for potential effects on Section 106 resources.

Table 2.6 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Application of Strategies

Coordinated and Responsive Agency Involvement

While the strategy of coordinated and responsive agency involvement typically is considered for projects that require more complex permitting or reviewing needs, it can also help to streamline interactions on projects with minimal need for review (i.e., on projects less likely to affect Section 106 resources) by establishing criteria for reduced timelines and process.

Planning-Level Environmental Screening Criteria

Establishing planning-level screening criteria can allow DOTs to better prioritize and anticipate Section 106 consultation requirements with SHPOs. By identifying projects with more and less likelihood of affecting Section 106 resources, these agencies can allocate staff more efficiently and develop more realistic project schedules early in project development.

DOT-Funded Liaisons

DOT funding can help SHPOs to provide staff dedicated to working on transportation projects and developing and implementing protocols for Section 106 consultation. This DOT investment can improve interagency coordination and reduce delay during review of environmental documentation and permit applications.

Programmatic Agreements for Section 106

Agreements among DOTs, FHWA, and SHPOs have proven to be an effective method for identifying classes of projects and activities that do not require individual Section 106 review by SHPO and for defining evaluation techniques undertaken on projects with the potential to affect Section 106 resources. These and other streamlining measures can be developed in a programmatic agreement to enhance interagency coordination, avoid unnecessary time and effort on routine activities, and ultimately improve Section 106 review and compliance.

Table 2.6. Constraint 6: Effects and Mitigation Strategies

	Severity	
	Low	**High**
Effects	• Lack of programmatic agreement but strong relations between agencies involved in Section 106 reviews helps to ensure they rarely hold up projects • Programmatic agreement in place between state DOT, SHPO, and FHWA, but its use is limited because of narrow provisions, out-of-date information, or lack of understanding or appreciation from some parties • Section 106 consultation is functioning acceptably, but agencies desire a more streamlined approach	• Coordination with SHPO and its Section 106 reviews is requiring additional time and cost on many projects unlikely to affect Section 106 resources • SHPO resources are severely strained due to the high volume of projects to review
Mitigation strategies	• Coordinated and responsive agency involvement • Planning-level environmental screening criteria	• Coordinated and responsive agency involvement • Planning-level environmental screening criteria • DOT-funded liaisons • Programmatic agreement for Section 106

Constraint 7: Inordinate Focus on Single Issue

Projects can become paralyzed if an inordinate amount of focus is placed on one resource or issue. This focus can be driven by an influential stakeholder with a particular interest or by an agency or stakeholder with a deep commitment to the resource. It is normal for resources to be divided up by groups and agencies; it is part of the structure within which planning occurs. However, sometimes an inordinate level of concern for a given resource seems to consume all the energy for a project.

Indications that this constraint may occur or has already occurred include

- Leading
  - Stakeholder focuses on a narrow portion of his or her organization's interests.
- Lagging
  - A single resource dominates all decision conversations or analyses;
  - A subset of regulated resources is the sole concern, although other subsets are present;
  - Technical background of participants drives the conversation or focus; or
  - Technical concerns are coming into policy processes with more detail than would be expected.

Table 2.7 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Application of Strategies

Facilitation to Align Expectations Up Front

Early facilitation allows for issues, concerns, and values to be clearly identified before conflict arises. Facilitation can set limits early in the process on how extensive the focus will be on specific resources.

Interagency Dispute-Resolution Process

By developing a clear process for handling disputes within a decision-making process, any issues that arise can be handled swiftly.

Real-Time Collaborative Interagency Reviews

Reviewing issues collaboratively in real time allows the entire team to address the importance of issues. This ensures that all issues are considered appropriately and that no one issue dominates the process.

Planning and Environmental Linkages

Similar to using planning-level environmental screening criteria, utilizing work done during the planning phase can help to frame the issues faced during NEPA and avoid focusing on topics of little concern or relevance to the project.

Coordinated and Responsive Agency Involvement

Consistent engagement with resource agencies can establish and maintain mutual agreement on the issues that are relevant to a project. This consistency helps to avoid the diversion

Table 2.7. Constraint 7: Effects and Mitigation Strategies

	Severity	
	Low	**High**
Effects	• One resource drives technical conversations and dominates the analysis • Only one participant and one resource is the source of focus • Weak regulatory connection to resource being focused on (e.g., Fish and Wildlife Coordination Act)	• Multiple groups hyper focus on one resource or a very narrow aspect of the resource • Technical focus dominates conversations among senior-level staff, including policy makers • Strong regulatory connection to resource being focused (e.g., ESA)
Mitigation strategies	• Facilitation to align expectations up front • Interagency dispute-resolution process • Real-time collaborative interagency reviews • Planning and environmental linkages • Coordinated and responsive agency involvement	• Facilitation to align expectations up front • Interagency dispute-resolution process • Real-time collaborative interagency reviews • Planning and environmental linkages • Coordinated and responsive agency involvement • Consolidated decision council • Up-front environmental commitment

to inapplicable or less important topics that can occur when resource agencies are only sporadically engaged.

Consolidated Decision Council

A decision council can provide direction, focus a project team on the relevant issues to be addressed, and enable participants in the process to keep each other within a reasonable set of decisions.

Up-Front Environmental Commitment

If project stakeholders have a known concern and interest in a specific resource that could be affected by a project, transportation agencies can prevent this issue from delaying the project by providing a commitment early in project development to avoid or enhance the resource.

Constraint 8: Insufficient Public Engagement or Support

Obtaining meaningful public engagement can be difficult unless people understand how they could be directly affected by a project. Attracting public interest in long-range planning efforts is chronically difficult because activities 10 to 20 years or more in the future do not have the same potential to concern or appeal to a community as more imminent projects. Socioeconomic barriers, lack of transportation, or perceived disempowerment can make engagement even more difficult. Insufficient public participation can make transportation planning less effective at supporting subsequent project development.

Indications that this constraint may occur or has already occurred include

- Leading
  - Project requires long-range planning;
  - Project has large and/or diverse constituencies;
  - Project needs to engage low-income and/or minority groups; or
  - Plan or project is looking at issues that have historically caused constituents to lose interest or to not take the latest efforts seriously.
- Lagging
  - Turnout at public meetings is poor;
  - Input from participants at meetings is low; or
  - Complaints from stakeholders, press, or the public that outreach is ineffective.

Table 2.8 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Application of Strategies

Highly Responsive Public Engagement

A highly responsive public engagement campaign can encompass a variety of techniques to generate more interest from the public and determine how public input is responded to and addressed during the development and screening of alternatives.

Media Relations Manager

A dedicated media relations manager may be an unaffordable luxury on some projects, but this person can provide valuable benefits to public participation by increasing media exposure and improving the accuracy of media reporting.

Context-Sensitive Design

Context-sensitive design can increase public support for a project by respecting local values and resources and by providing

Table 2.8. Constraint 8: Effects and Mitigation Strategies

	Severity	
	Low	**High**
Effects	• There is little public participation, largely because of the nature of the project, either because there is low public interest in the issues involved or because input is inherently simple given the issues being explored • Some potential stakeholder groups are disengaged due to lack of interest or awareness	• Lack of public input is delaying consensus and decision making • Stakeholder groups are disengaged because they feel disempowered or lack trust in the project's sponsoring agencies
Mitigation strategies	• Highly responsive public engagement	• Highly responsive public engagement • Media relations manager • Context-sensitive design • Early commitment of construction funding

amenities and benefits sought by the community. Modifying a design to achieve context sensitivity may be cost prohibitive or require compromises, but serious consideration of this strategy will likely attract more public engagement and support.

Early Commitment of Construction Funding

Early commitment of construction funding makes a project appear more real and imminent. It can be especially effective during early planning and the NEPA process for attracting more public engagement, if not support.

Constraint 9: Issues Arising Late Cause Project Change

Late issues or seemingly new issues introduced late in the planning or review process can lead to project delay. Sometimes this constraint stems from new participants entering the process, or it is used as a tactic to stall the overall process by requiring consideration of new options that may not be relevant.

Indications that this constraint may occur or has already occurred include

- Leading
  - Project relies on planning work that is several years old;
  - Project is large and/or complex;
  - Stakeholders present new reports; or
  - New stakeholders appear.
- Lagging
  - Challenges on alternatives are considered;
  - Range of alternatives expands; or
  - New issues emerge from stakeholders late in review, comment, or decision processes.

Table 2.9 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Application of Strategies

Aligning Expectations Up Front

Aligning expectations up front by using a facilitator early in the NEPA process to solicit stakeholders' ideas, desires, and concerns about a project (in addition to doing so during planning) can help to reduce the likelihood of issues ambushing the project leaders later on.

Real-Time Collaborative Interagency Reviews

Real-time collaborative interagency reviews that allow resource agencies and cooperating agencies to review NEPA documentation together with the NEPA lead agencies can allow project teams to more efficiently and effectively address any new issues that are raised during these reviews.

Highly Responsive Public Engagement

Highly responsive public engagement encourages greater involvement from the public early on and reduces the likelihood that unanticipated issues will crop up later in the process when they are more difficult to address.

Table 2.9. Constraint 9: Effects and Mitigation Strategies

	Severity		
	Low	**Medium**	**High**
Effects	• Single issue added with analysis using existing data • New information results in refining design elements • Stakeholders raising narrow policy concerns (local, single issues)	• New issue or consideration requiring new data • Stakeholders raising concerns that require changes to permitting requirements	• Fundamentally different alternatives included • New alternatives are added, reevaluation is needed, or class of action moves up • Stakeholders with broader policy concerns (national, multiple-issue groups)
Mitigation strategies	• Facilitation to align expectations up front • Highly responsive public engagement • Planning and environmental linkages • Planning-level environmental screening criteria • Regional environmental analysis framework • Real-time collaborative reviews	• Facilitation to align expectations up front • Highly responsive public engagement • Planning and environmental linkages • Planning-level environmental screening criteria • Regional environmental analysis framework • Change-control practices • Interagency dispute resolution • Tiered NEPA	• Facilitation to align expectations up front • Highly responsive public engagement • Planning and environmental linkages • Planning-level environmental screening criteria • Regional environmental analysis framework • Change-control practices • Interagency dispute resolution • Tiered NEPA

Planning and Environmental Linkages

Leveraging planning work during the NEPA process helps project leaders to identify potential issues earlier, when they can be proactively addressed and are less likely to cause unexpected work and delay.

Planning-Level Environmental Screening Criteria

Planning-level environmental screening criteria allow transportation agencies to identify potential issues early on and avoid surprises during later phases of project development when they are more likely to cause delay.

Change-Control Practices

Change-control practices can minimize the frequency and severity of changes to project design after preliminary design and environmental documentation and thus can reduce the chances of delay due to revising prior permit applications, environmental documentation, and other prior work.

Interagency Dispute-Resolution Process

An interagency dispute-resolution process can address disagreements that arise when resource agencies raise issues later than expected. An established resolution process can help parties to arrive more quickly at a determination on how to proceed.

Tiered NEPA Process

A tiered NEPA process allows analysis and decisions completed during project planning to be more reliable during the next phase of project development, reducing the likelihood that issues already addressed will need to be looked at again.

Regional Environmental Analysis Framework

A regional environmental analysis framework improves the ability of transportation agencies to identify potential issues early in planning and project development. Providing data on the location of natural and cultural resources allows agencies to make better-informed decisions during early phases and to avoid problems during later phases that require design changes.

Constraint 10: Lack of Dedicated Staff

Transportation agency resources are often stretched thinly across many different projects and initiatives, which can result in insufficient staffing resources and delayed progress. Projects can suffer from insufficient staff resources because of programmatic or agencywide changes that compete with project staff time or because of new developments specific to the project that require additional staffing.

Indications that this constraint may occur or has already occurred include

- Leading
  - Agency rapidly assumes more projects;
  - Agency assumes new jurisdiction or provision of new services;
  - Agency changes priorities; or
  - Project undergoes changes that introduce new significant impacts or greatly increase design complexity.
- Lagging
  - Progress is slowed or halted because the project team is not able to complete work on time.

Table 2.10 describes the likely effects from the manifestation of the constraint at different severities and the strategies

Table 2.10. Constraint 10: Effects and Mitigation Strategies

	Severity		
	Low	**Medium**	**High**
Effects	• Project delay due to staff resources that are temporarily unavailable or insufficient, but that will become available either as they finish other priorities or through reprioritization	• Staffing deficiency in agencies outside of those leading the project	• Insufficient staff resources for tasks demanding expertise that is difficult to obtain • Widespread deficiency in staff resources that will require major hiring, reallocation, and/or additional consultant services
Mitigation strategies	• Strategic oversight, readiness assessment	• Strategic oversight, readiness assessment • DOT-funded liaisons • Early commitment of construction funding	• Strategic oversight, readiness assessment • DOT-funded liaisons • Early commitment of construction funding • Team co-location

that may help to prevent or address the constraint at each degree of severity.

Application of Strategies

Strategic Oversight and Readiness Assessment

This strategy focuses on developing a management plan for staff resources across all agencies before the project begins. If a deficiency is identified, resources can be reprogrammed if possible.

DOT-Funded Liaisons

For DOTs with a repeated need for decision making or review by resource agencies, liaisons offer an opportunity to make sure the staff time is dedicated.

Early Commitment of Construction Funding

When a project has money for construction, it can be much easier for agencies to justify hiring or reallocating staff to the project. In some cases, the construction funds may be useable prior to construction to pay for additional staff.

Team Co-location

Projects staffed by multiple agencies can often suffer sporadic neglect as one or more agencies reallocate staff to other priorities. Providing a single office for all project staff to work in reduces the likelihood of this occurring.

Constraint 11: Lengthy Review and Revision Cycles

Preparation and publication of planning studies and NEPA documentation can be delayed by protracted review and revision cycles. Delay can occur on projects with multiple reviewing agencies, particularly if their reviews occur sequentially (i.e., lead agency review first, then cooperating agencies, followed by resource agencies); if additional reviews are requested; if reviewers require more time than originally allotted; and/or if time is needed for reconciliation between conflicting reviewers.

Indications that this constraint may occur or has already occurred include

- Leading
  - Multiple lead agencies have different implementation policies;
  - Resource agencies will review major documents before publication; or
  - There are several cooperating agencies.
- Lagging
  - Multiple, sequential reviews are on the critical path toward completing the plan or NEPA documentation; or
  - Reconciliation of comments is delaying the document.

Table 2.11 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Table 2.11. Constraint 11: Effects and Mitigation Strategies

	Severity		
	Low	**Medium**	**High**
Effects	• Lead agency unwilling to engage in concurrent reviews with other agencies • More than one round of review by the same parties	• Several rounds of review by the same parties • Conflicting comments require reconciliation process	• Reconciliation of comments becomes cyclical, with reviewers requiring additional reviews and introducing new edits • Irreconcilable comments are stagnating progress toward finalizing and publishing the document
Mitigation strategies	• Real-time collaborative interagency reviews • Expedited internal review and decision making • Planning and environmental linkages • Planning-level environmental screening criteria • Coordinated and responsive agency involvement • Facilitation to align expectations up front	• Real-time collaborative interagency reviews • Expedited internal review and decision making • Planning and environmental linkages • Planning-level environmental screening criteria • Coordinated and responsive agency involvement • Facilitation to align expectations up front • Early commitment of construction funding	• Real-time collaborative interagency reviews • Expedited internal review and decision making • Planning and environmental linkages • Planning-level environmental screening criteria • Coordinated and responsive agency involvement • Facilitation to align expectations up front • Early commitment of construction funding • DOT-funded resource agency liaisons • Team co-location • Programmatic permits

Application of Strategies

Real-Time Collaborative Interagency Reviews

Concurrent reviews among multiple agencies, as well as real-time drafting and revising, can expedite agreement on environmental documentation. Allowing resource agencies and cooperating agencies to review documentation at the same time as DOT management and FHWA or FTA staff can substantially shorten the review–revision cycle for NEPA documentation and facilitate reconciliation of conflicting comments.

Expedited Internal Review and Decision Making

This strategy entails establishing internal protocols and time frames for reviews. By establishing early agreement among reviewing agencies on the review process, a project can avoid uncertainty, more accurately develop a schedule, and maintain planned progress when distributing environmental documentation for review.

Planning and Environmental Linkages

Referencing work done during prior planning studies, rather than redeveloping it, can make review and revision of NEPA documentation simpler and potentially less contentious if reviewing parties were involved during the early planning work.

Planning-Level Environmental Screening Criteria

Incorporating environmental factors into planning-level screening can help to address a wide set of potential issues and concerns early on and allow NEPA documentation to incorporate the planning work by reference, thereby simplifying the documents and their review.

Coordinated and Responsive Agency Involvement

Stronger collaboration with resource agencies throughout, and even before, the NEPA process can streamline their review of the environmental documentation. They will have a better understanding of the project and how it has developed, and project leaders will be able to proactively address their interests and concerns.

Facilitation to Align Expectations Up Front

Explaining a project's goals, constraints, and intended process to resource agencies and stakeholders early on—during planning or at the outset of a NEPA process—can reduce unrealistic expectations from these parties and alert the transportation agencies to their interests earlier. This can avoid delay later on when these parties review environmental documentation.

Early Commitment of Construction Funding

Having construction funding in place can add pressure for a project to progress through the environmental process toward construction. With funding accounted for, agencies and individual reviewers should be less likely to feel they can delay the preparation of environmental documentation by extending the review and revision process.

DOT-Funded Resource Agency Liaisons

Reviewing environmental documentation often requires more staff commitment from resource agencies than they can readily provide. An expensive but potentially worthwhile option can be for transportation agencies to fund dedicated liaison positions at these resource agencies.

Team Co-location

Providing a single location for a project team is helpful on projects involving multiple agencies, particularly when these agencies are each reviewing a complex NEPA document. Having these reviewers work in the same office cuts down on the effort and time required for communication and coordination of their reviews.

Programmatic Permits

Relying on policies and stipulations previously developed and agreed on by relevant agencies can reduce resource agency review effort. Using preexisting policies and stipulations, rather than crafting project-specific variants, minimizes the amount of scrutiny required from resource agencies, so long as an applicable programmatic permit is available. If one does not already exist, developing a programmatic permit may also be helpful for DOTs pursuing multiple projects with similar permitting requirements.

Constraint 12: Negative or Critical Coverage from the Media

Projects often encounter challenges when media coverage highlights or stokes controversy and opposition. A variety of factors can create or contribute to these difficulties. Projects leaders can fail to anticipate hot-button issues with local media outlets or stakeholder groups, or they may identify the issues but not develop effective methods for addressing these issues or working with these groups. Transportation agencies often struggle to communicate information, either in meetings or via press releases, that both anticipates and clearly addresses topics of potential interest and concern to the press and their public audience.

Table 2.12. Constraint 12: Effects and Mitigation Strategies

	Severity	
	Low	**High**
Effects	• Project is receiving negative press coverage, but this does not appear to be swaying opinions of many public participants or stakeholder groups • Media coverage is misrepresenting information about the project, but the reporters are willing and able to correct the information	• Negative press coverage and/or opinion editorials are swaying the attitudes and input from public participants and stakeholder groups • Media coverage is consistently providing incorrect information about the project that is difficult to correct
Mitigation strategies	• Highly responsive public engagement	• Highly responsive public engagement • Media relations manager

Indications that this constraint may occur or has already occurred include

- Leading
  - Local media outlets have a history of criticizing similar projects; or
  - Prior planning or design efforts have resulted in public controversy.
- Lagging
  - Information released at public meetings or directly to the press is misrepresented or unused by local media coverage;
  - Opinion editorials about the project are largely critical and/or poorly informed; or
  - Media coverage prompts concerns from stakeholder groups.

Table 2.12 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Application of Strategies

Highly Responsive Public Engagement

A highly responsive public engagement campaign can help to avoid frequent media criticism of the project's public process. Also, improving public participation can bolster support for a project and reduce the likelihood that some media outlets will provide negative coverage.

Media Relations Manager

Hiring a dedicated media relations manager can be the most effective approach to directly preventing or addressing negative or inaccurate reporting. This position can help to structure information releases to be more readily useable by the press, thereby reducing the chances that information will be mischaracterized. A media relations manager can also improve direct correspondence and coordination with media outlets to address or prevent critical coverage.

Constraint 13: Relocation Process Delays Construction

Property acquisition and the relocation of residents or businesses are often on the critical path to the start of construction, which adds pressure on the transportation agency to quickly negotiate replacement housing payments and other settlement issues that must be completed during the relocation process. This process can be stressful for tenants or business owners, who generally have different motivations than the transportation agency, and can lead to protracted negotiations that delay relocation and subsequent project activities. With the relocation process frequently on the critical path to construction, and given the direct implications of delay to project cost, transportation agencies will often benefit from techniques that expedite relocations.

Indications that this constraint may occur or has already occurred include

- Leading
  - Many relocations are likely to be necessary for the project;
  - Residential or commercial relocations have unique or specific requirements; or
  - Early discussions with owners or tenants of properties likely to be acquired reveal resistance or other indications that they could protract the relocation process.
- Lagging
  - Relocation process is behind schedule and on the project's critical path.

Table 2.13 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Table 2.13. Constraint 13: Effects and Mitigation Strategies

	Severity	
	Low	**High**
Effects	• Negotiations with some property owners or tenants are taking more time than originally planned, but no critical barriers are encountered • Unable to reach agreement with one or more property owners about suitable replacement properties; all or major portions of construction can continue as scheduled	• Unable to reach agreement with one or more property owners about suitable replacement properties; construction is delayed
Mitigation strategies	• Media relations manager • Highly responsive public engagement	• Media relations manager • Highly responsive public engagement • Incentive payments

Application of Strategies

Media Relations Manager

A media relations manager can provide effective outreach to residents or businesses being displaced by a project by ensuring that information about the project, including the process and timeline for relocations, is accurately covered by the local news media. This will help to avoid confusion and delay from inaccurate coverage.

Highly Responsive Public Engagement

A robust public engagement strategy, like a media relations manager, will ensure residents and businesses are informed of the relocation process and timeline.

Incentive Payments

Incentive payments can encourage residents and businesses to participate in the relocation project quickly. This expense can save money on projects that have many relocations on the critical path to construction.

Constraint 14: Slow Decision Making

When decisions take longer than expected or anticipated, the decision-making process can feel unclear, as can the path to agreement. At times, it may seem there is a low level of interest in committing to a decision and that indecision prolongs the process.

Indications that this constraint may occur or has already occurred include

- Leading
  - Project has multiple sponsors;
  - Project is located in two states;
  - Project has or had difficulty moving from planning to project delivery (e.g., stuck in long-range transportation planning);
  - There is no clear project champion; or
  - External decision makers are involved.
- Lagging
  - Work is stalled or stopped while waiting for decisions;
  - Assumptions are used to address decisions that are not being made, and managers move forward with assumed decisions or risk-based decisions to address lack of decision; or
  - Decisions or commitments are not clearly owned by anyone.

Table 2.14 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Application of Strategies

Team Co-location

Co-locating the consultant team with the DOT team allows for faster review of issues and internal decision making. While this arrangement can incur more costs, depending on the situation, it is generally applicable to any project size.

Real-Time and Collaborative Interagency Reviews

Many small decisions or reconciling concerns can combine to create significant delay. By coordinating all reviewers in real time, many issues can be dealt with quickly in an open forum.

Expedited Internal Review and Decision Making

Securing early agreement among internal project stakeholders for specific time frames and processes for decision making

Table 2.14. Constraint 14: Effects and Mitigation Strategies

	Severity		
	Low	**Medium**	**High**
Effects	• One or two stalled decisions add less than a week to decision making • Single decision maker is slow to come to decision • Leadership or a champion is available, but having challenges engaging or committing • Infrequent issue (only once or twice in a project) • Decision-making challenges are only with decision makers internal to the project team (DOT or FHWA) • Decisions or commitments seem to have an unclear path and are resolved barely in time	• Multiple slow decisions are causing delays that are significant to certain tasks, but not delaying overall schedule • Internal or external decision makers may be involved • Not sure when to start with decisions, no clear decision maker	• Slow decisions delay or prevent critical milestones for planning or project delivery • Multiple decision makers failing to reach decisions or causing delay • Both external and internal decision makers are contributing to delay • No clear path or leadership • Recurring issue for which decisions repeatedly are not made
Mitigation strategies	• Team co-location • Real-time collaborative interagency reviews • Expedited internal review and decision making	• Team co-location • Real-time collaborative interagency reviews • Expedited internal review and decision making • Consolidated decision council • Planning and environmental linkages • Early commitment of construction funding	• Team co-location • Real-time collaborative interagency reviews • Expedited internal review and decision making • Consolidated decision council • Planning and environmental linkages • Early commitment of construction funding • Strategic oversight, readiness assessment

can avoid uncertainty when decisions are needed, and thus prevent delay.

Consolidated Decision Council

For larger projects that justify the effort and preplanning, dedicated councils can create a set structure for decision making. Councils explicitly identify the authority and scope of decision making, allowing issues or questions to be placed on the agenda, considered, and decided on effectively.

Planning and Environmental Linkages

Decision making during the NEPA process can be expedited if it can rely on or use documentation and decisions made during previous planning studies. Agreements made during planning provide a foundation on which to make decisions and help decision makers justify their choices.

Early Commitment of Construction Funding

Without known funding agencies may delay making tough decisions. Allocated funding adds pressure to make decisions to progress toward construction. This can be especially true when funding is paired with required time frames so that decisions must be made for the imposed schedule to be achieved.

Strategic Oversight and Readiness Assessment

This strategy focuses on developing a management plan for decision making before the project begins or at the very beginning. It requires a substantial investment to implement and therefore is best suited to larger projects. By identifying needed decision makers, resources, and critical paths early, decision making can be expedited through effective planning.

Constraint 15: Stakeholder Controversy and Opposition

Stakeholder opposition or controversy can lead to project delay or even cancellation. Stakeholders may oppose one or more particular elements or alternatives for a project, or they may simply reject the validity or merit of the entire endeavor. This opposition can produce controversy and delay progress.

Indications that this constraint may occur or has already occurred include

- Leading
  - Project will introduce unfamiliar or unknown changes to surroundings;
  - Stakeholder groups exist with potential to oppose project;

Table 2.15. Constraint 15: Effects and Mitigation Strategies

	Severity	
	Low	**High**
Effects	• Opposition to discrete element(s) of the project • Concerns from stakeholders or agencies can be easily addressed by evaluation, documentation, and discussion • Stakeholders raising narrow policy concerns (local, single issues)	• Opposition to the entire project • Opposition seeks entirely different alternative(s) and/or reevaluation • Stakeholders with broader policy concerns (national, multiple-issue groups) • Stakeholder concerns are not swayed by data
Mitigation strategies	• Facilitation to align expectations up front • Regional environmental analysis framework • Highly responsive public engagement	• Facilitation to align expectations up front • Regional environmental analysis framework • Highly responsive public engagement • Media relations manager • Up-front environmental commitments irrespective of project impacts • Context-sensitive design

  - Preexisting agreements or plans exist that conflict with the project;
  - Significant changes to demographics or property ownership will occur in the project area; or
  - Similar projects have faced significant opposition in the region.
- Lagging
  - Progress with public outreach or coordination with resource agencies is stalled because issues of concern remain unaddressed or unresolved; or
  - Stakeholders have mobilized opposition to project or elements of the project.

Table 2.15 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Application of Strategies

Facilitation to Align Expectations Up Front

Facilitation can help projects align stakeholder expectations early during project development by encouraging participants to express their desires and concerns and to hear others' thoughts about the project. Facilitated discussions help stakeholders both to influence and understand the goals and constraints of the project, minimizing disappointment and opposition later on.

Regional Environmental Analysis Framework

A regional environmental analysis framework allows agencies to develop consensus on the approach for evaluating potential impacts to resources of concern. Having this framework in place allows project management to better anticipate likely issues of concern for stakeholders and to adapt or address the issues earlier in project development.

Highly Responsive Public Engagement

Highly responsive public engagement will also help DOTs to anticipate likely issues of concern for stakeholders. This outreach facilitates identifying issues that may lead to opposition from stakeholders, and it allows the DOT to better explain to them the constraints or demands the agency is operating under that could result in project elements that are undesired by stakeholders.

Media Relations Manager

A media relations manager can help the project to avoid or moderate controversy that can be sparked by inaccurate or misleading media coverage. By better communicating with media outlets, opposition and criticism are less likely to grow beyond the agency's ability to address them.

Up-Front Environmental Commitments

By providing meaningful environmental commitments early in project development, DOTs can proactively address potential issues of concern from stakeholder groups that could otherwise delay the project.

Context-Sensitive Design

Adapting the project design to respond to stakeholder concerns can be the most meaningful and significant response to stakeholders, although this may be challenging or even infeasible depending on stakeholder demands.

Constraint 16: Unusually Large Scale of and/or Complex Project or Program

DOTs are occasionally faced with a project or program of projects that is larger and more complex than what they are accustomed to. These projects or programs may entail many separate components that form a major infrastructure improvement or distinct projects of a similar nature that are being addressed programmatically. Typically, projects of unusually large scale and/or complexity cannot be pursued efficiently or effectively with a business as usual approach. Instead, decision making, permitting, and designing will require new techniques to be accomplished efficiently.

Indications that this constraint may occur or has already occurred include

- Leading
  - Project is larger in scope and cost than usual;
  - Project is the largest project of its type that the agency has pursued;
  - Project is the first project of its type;
  - Project or program spans a multistate or statewide region; or
  - Multiple related projects are being pursued programmatically.
- Lagging
  - Decisions are stalled due to difficulty in gathering consensus from multiple parties; or
  - Decisions or analysis are being done repetitively for multiple, similar issues.

Table 2.16 describes the likely effects from the manifestation of the constraint at different severities and the strategies that may help to prevent or address the constraint at each degree of severity.

Application of Strategies

Team Co-location

Providing a single location for all project staff improves internal communication and decision making on projects with diverse teams from different agencies and consultants who would otherwise be working from multiple, separate offices. While this strategy will not directly address some of the specific analytical and documentation challenges faced by projects of unusual complexity, it should help to streamline the project team's efficiency and reduce potential bottlenecks.

Coordinated and Responsive Agency Involvement

Large, complex projects generally require coordination with more local, state, and federal resource agencies, necessitating a well-defined and collaborative approach for their involvement. As the number of agencies involved increases, it becomes easier for some to feel marginalized if their concerns and interests are overshadowed by those of other agencies. A highly responsive coordination strategy can help to avoid this.

Dispute-Resolution Process

With more agencies and stakeholders involved in large projects, there is an increasing likelihood of delay from protracted

Table 2.16. Constraint 16: Effects and Mitigation Strategies

	Severity	
	Low	**High**
Effects	• Project or program is delayed, but other projects are not affected • Some unique or highly complex elements in an otherwise more ordinary project or program	• Project or program is delayed and is also slowing other projects • Many or all aspects of the project are unique or complex
Mitigation strategies	• Team co-location • Coordinated and responsive agency involvement • Dispute-resolution process • Strategic oversight, readiness assessment • Early commitment of construction funding • Expedited internal review and decision making • Real-time collaborative interagency reviews	• Team co-location • Coordinated and responsive agency involvement • Dispute-resolution process • Strategic oversight, readiness assessment • Early commitment of construction funding • Expedited internal review and decision making • Real-time collaborative interagency reviews • Performance standards • Programmatic permitting • DOT-funded resource agency liaisons • Consolidated decision council • Tiered NEPA process

or stalled debate. A dispute-resolution process can help to unlock these debates, whether they occur between co-lead agencies or with resource agencies.

Strategic Oversight and Readiness Assessment

This strategy is designed to assess staffing requirements for major projects and programs requiring commitments from multiple agencies. When implemented early on, readiness assessment will identify staffing demands and areas that need bolstered resources. Strategic oversight and readiness assessment can also provide a common system of project and program management protocols for finances, schedule, and oversight.

Early Commitment of Construction Funding

Funding can help large projects to appear more feasible and more likely to come to fruition, both to a project team and also to resource agencies and stakeholder groups. Major projects can languish when project teams or stakeholders believe a project is unaffordable, and commitment of funding can avoid this perception. Furthermore, funding commitments with specific timeline requirements can provide momentum and add pressure for agencies and stakeholders to move quickly.

Expedited Internal Review and Decision Making

Large, complex projects usually have multiple agencies involved in reviews and decision making, and having an expedited internal review and decision-making process in place can help simplify and streamline such projects. Establishing commitments from agencies on the process and time frame for project actions is an important tool for avoiding uncertainty and delay.

Real-Time Collaborative Interagency Reviews

The review and revision process for environmental documentation can be complicated on projects with multiple lead agencies and/or with a variety of cooperating and resource agencies that must review and approve the documents. These reviews, and the subsequent revisions, can be completed more quickly if all agencies are able to review and comment together, rather than in sequential rounds of review and revision. Other collaborative techniques can further streamline the process.

Performance Standards

This strategy can allow project teams to develop permit applications with commitments to specific outcomes (e.g., the impact to a resource will be equal to or less than a specified amount) without having to analyze and debate the potential impacts from the project design with resource agencies. Such debate is a common source of delay during environmental documentation and permitting, and it is an especially high-risk portion of the schedule for projects with designs that resource agencies are not accustomed to permitting.

Programmatic Permitting

This strategy can expedite the process of permitting multiple actions or projects with common attributes and impacts. By developing a common set of analytical techniques, environmental criteria, and documentation as the basis for a programmatic approach to permitting, the DOT can realize major efficiencies and cost savings.

DOT-Funded Resource Agency Liaisons

Major projects often require significant staff commitments from resource agencies. By funding liaison positions at resource agencies, DOTs can better ensure that their project will receive the time and attention it needs to receive review, input, and approval from these agencies.

Consolidated Decision Council

A small group of appointed managers can streamline decision making on large projects when multiple agencies are involved in developing the project design. A group comprising a single designated project leader from each of these agencies can simplify consensus building and decision making on complex, multijurisdictional projects.

Tiered NEPA Process

Projects with a large, complex scope of improvements generally start development with in-depth planning studies to frame the issues and problems they will address and to gauge stakeholder interest and concern. These planning studies can provide valuable information for a subsequent NEPA process, including the development and screening of potential alternatives. A tiered NEPA process can allow some of this planning to be done under the auspices of NEPA, and thus ensure this work is more readily and efficiently usable for ensuing project-level NEPA studies.

CHAPTER 3

Strategies for Addressing or Avoiding Constraints

This chapter describes 24 expediting strategies. These descriptions are designed as stand-alone guides to the strategies and are intended to aid practitioners' understanding of how the strategies may apply to their projects. More specific information on the implementation of these strategies can be found in the case studies in Chapter 4.

The format chosen for the strategy descriptions facilitates their integration with the web-based materials being developed for SHRP 2 and distributed through the Transportation for Communities: Advancing Projects through Partnerships (TCAPP) website. The TCAPP website is gathering the research products from SHRP 2 efforts and provides a central place for end users to access the results (*1*).

Each strategy is categorized by the general strategy group(s) (explained in Chapter 1), the applicable phase(s) of project development in which the strategy could be implemented, and any applicable decision points as defined on the TCAPP website (*1*).

Next, the strategy is described, the constraint is addressed, and examples of projects and agencies that have implemented the strategy are given, along with web addresses that provide further information.

The effectiveness of the strategy is qualitatively evaluated on four measures: (*a*) schedule, (*b*) cost, (*c*) risks, and (*d*) any other benefits. These effects are not evaluated to rate or rank the strategies, but to provide readers with some important considerations for implementing these strategies.

Finally, a description is provided of the general applicability of the strategy, including the types of projects or agencies that might benefit from it and any other factors that may influence the benefits or risks of the strategy.

Table 3.1 links each of the expediting strategies to the particular constraints it is intended to address.

Strategy 1: Change-Control Practices

- **Strategy Group:** Decision making
- **Phase:** Final design
- **Decision Points:** Any/all decision points

Definition

This strategy applies to agencywide or programmatic change-control practices.

Several states have invested in change-control practices that attempt to minimize the frequency and severity of changes to projects' design following preliminary design and environmental documentation.

At the California DOT (Caltrans), an agencywide change-control team provides recommendations to determine how to reduce the number and extent of design changes that occur after project approval. These recommendations led to the adoption of Caltrans' change-control guidelines, which reduce the number of project-scope changes that occur after project approval. District change-control teams establish and monitor the progress of district change-control implementation plans. These teams document, review, monitor, and report all project-scope changes after project approval and environmental documentation; record lessons learned; and establish internal performance metrics.

Utah DOT (UDOT) initiated a pilot change-control program after the agency had identified change orders related to design errors as a significant source of inefficiency with regard to both cost and project delays. By involving the construction contractor in the design process, UDOT anticipated that design errors would be caught early and contractors would absorb the risk associated with those errors. UDOT has early indications that this construction manager–general contractor model has reduced the number of change orders related to

Table 3.1. Expediting Strategies and Constraints

Strategy	Stage of Project Planning or Delivery				
	Early Planning	Corridor Planning	NEPA	Design/ROW Permitting	Construction
1. Change-control practices			●	●	●
2. Consolidated decision council		○	●	●	
3. Context-sensitive design and solutions	○	○	●	●	○
4. Coordinated and responsive agency involvement	○	●	●	●	●
5. Dispute-resolution process		○	●	●	○
6. DOT-funded resource agency liaisons		○	●	●	
7. Early commitment of construction funding	●	●	●		
8. Expedited internal review and decision making	●	●	●	●	
9. Facilitation to align expectations up front	○	●	●		
10. Highly responsive public engagement	●	●	●	●	○
11. Incentive payments to expedite relocations				●	
12. Media relations manager		●	●	●	○
13. Performance standards	○	●	●	●	
14. Planning and environmental linkages	●	●	●		
15. Planning-level environmental screening criteria	●	●			
16. Programmatic agreement for Section 106			●	●	
17. Programmatic or batched permittings			●	●	
18. Real-time collaborative interagency reviews	○	○	●	○	
19. Regional environmental analysis framework	○	●	●	●	
20. Risk management	●	●	●	●	●
21. Strategic oversight and readiness assessment	○	●	●		
22. Team co-location		○	●	●	
23. Tiered NEPA process	○	●	●		
24. Up-front environmental commitments		●	●	●	

Note: NEPA = National Environmental Policy Act; ROW = right-of-way; ● = directly applicable; ○ = conditionally applicable.

design errors; however, the agency frequently uses change orders to expend funds that are either freed by negotiations or legislatively allocated. UDOT employs change orders for this purpose on all projects, regardless of the contracting method. This practice complicates the analysis of the impact of the construction manager–general contractor arrangement on change orders and overall budget. Determining the effects of this arrangement would require analysis on a project-by-project basis, which has not yet been completed by the agency (*2*).

New Jersey established a change-control board to review and approve changes and requests affecting design and construction in an effort to control costs and reduce scope changes. During the preparation of roadway plans, when a design change appears to be necessary or desirable, a design change request is submitted to the change-control board for review. A design change request is required if a change occurs in a design stage of a project that modifies the concept as outlined in the proposal or if the change(s) would increase project costs above certain predefined thresholds.

In Florida, changes are formally reviewed and compared to set thresholds. This provides project managers with some latitude to manage a project so long as it remains within the agreed-on time or budget limits. The project budget and schedule cannot be modified beyond the set thresholds without committee review and approval by a standing committee of senior management (*3,* p. 12).

Constraints Addressed

This strategy is designed to minimize design changes that occur after project approval.

Reducing scope changes can cause the DOT to appear inflexible to stakeholders. Caltrans discovered that most change-control requests resulted from local requests. It is critical to

ensure that the change-control process is open to considering changes that may be appropriate and even necessary to advance a project or achieve other objectives. Changes to project design following project approval and environmental documentation can result in significant delays. The final design process that typically follows environmental review often requires changes to the project design. Unanticipated changes to project design often cause delay if they alter right-of-way requirements or modify environmental impacts so that reevaluation or changing permitting requirements is required. Changes that increase impacts or costs are particularly likely to cause delays, as well as other negative effects on project delivery.

This strategy can help to address the following constraints:

- Issues arising late cause project change, and
- Inability to maintain agreement.

Example

I-94 North–South Freeway Project

The leaders of this Wisconsin project held biweekly meetings with the state Secretary of Transportation's staff. The meetings discussed project progress, changes, and the reasons for each. This communication process limited unanticipated changes and costs (*4*).

Effectiveness

Schedule

Changing project design after environmental review and approval is a frequent cause of delay. By implementing programmatic or agencywide assessment of project changes, DOTs can implement policies and procedures that reduce the frequency and magnitude of these project changes and the delay they can incur.

Cost

This strategy requires up-front funding to assess how changes to project design are affecting cost and schedule of project delivery and ongoing funding to implement change-control policies and to monitor progress. Managing and reducing changes to project design can avoid cost increases and the expense of delay.

Risks

Scope change control minimizes the risk that the DOT will appear inflexible to stakeholders. Caltrans discovered that most change-control requests (and hence project delay) did not relate to the environment per se, but rather local requests. DOTs need to ensure that they are not so excessively committed to avoiding design changes such that they deny reasonable and feasible changes that may be needed to address previously unknown information, constraints, or opportunities. Such changes can be integral to advancing a project.

Other Benefits

Benefits from change control can include

- Enhanced ability to honor delivery commitments;
- Lower risk (in the form of improved cost estimates, delivery schedules, and quality impacts);
- Established base for performance measures;
- Enhanced ability to reduce rework and monitor impacts of rework;
- Clearer direction for project development process; and
- More accurate workload estimating.

Strategy 2: Consolidated Decision Council

- **Strategy Group:** Decision making
- **Phases:** Planning, NEPA, design
- **Decision Points:** Multiple decision points

Definition

A consolidated decision council can create a clear organization, structure, and process for efficient decision making. Councils identify the ability and scope of decision making explicitly and allow for issues or questions to be on the agenda, considered, and decided on effectively and efficiently.

Constraints Addressed

Lengthy or poorly understood decision processes, as well as decisions that take longer than expected, cause direct delay and can create a general sense among all parties that project expediting is not actually a high priority. Decision problems arise when decision processes are unclear or cumbersome, decision authority is unclear, or the decisions that need to be made are not clearly articulated. Projects with multiple sponsors can be especially vulnerable to lengthy and inefficient decision making.

This strategy can help to address the following constraints:

- Unusually large scale of and/or complex project or program;
- Ineffective internal communication;
- Slow decision making;
- Inability to maintain agreement;
- Inordinate focus on single issue; and
- Avoiding policy decisions through continual analysis.

Examples

Milton–Madison Bridge Project

This project formed the Milton–Madison management team (M3T) to facilitate the rapid and effective decision making needed for the project team to stay on track with their aggressive schedule to replace the Ohio River bridge between Milton, Kentucky, and Madison, Indiana. A project management team is commonly formed on medium and large projects, but these teams are not always successful at coming to consensus and making decisions quickly enough to avoid delay, especially when schedules are compressed. Several factors contributed to the success of the M3T:

- FHWA was a key member of the group;
- The core group was small;
- M3T staff could easily contact the executives of their agency directly;
- Meetings were frequent, with decision topics identified in advance; and
- A dispute-resolution process was important at several key points.

The Milton–Madison project case study in Chapter 4 provides more detail on this strategy.

Maryland Intercounty Connector

The Principals +1 group provided executive level leadership and direction for this project. This group was composed of the top-level official and one technical-level staff member from each state and federal agency involved on the project. The commitment and authority of these executive-level staff provided the policy-level direction needed for this project to stay on schedule.

This project is also provided as a case study in Chapter 4.

Effectiveness

Schedule

Faster and better decisions translate into avoiding delays and keeping progress moving. They also set a precedent for expediting other tasks and indicate a commitment to efficient and judicious progress.

Cost

A dedicated decision council requires a commitment of senior staff, which can be expensive, but the cost savings associated with avoiding decision-related delays can be substantial.

Risks

Hasty decisions carry a substantial risk of making poor choices or having to reopening those decisions at a later time. This strategy, however, is not about forcing quick decisions. It is about providing a clear process, clear authority, and clear structure for making informed decisions efficiently. Such an approach reduces risk.

Other Benefits

A clear, predictable, and efficient process for making informed and inclusive decisions can build transparency and build trust among participants.

Applicability and Transferability

A dedicated decision council could be used for any type of project or program. The cost and dedication required of senior staff is more likely to be justified with larger, controversial, and/or high-priority projects. Smaller and less controversial projects are less likely to benefit significantly relative to the added labor cost and demand on senior staff time.

The basic elements of a decision council are transferable to other agencies, projects, or programs, but they will need to be customized to address the particular needs of the project, the agencies, the issues, and the decision makers.

Strategy 3: Context-Sensitive Design and Solutions

- **Strategy Group:** External coordination and communication
- **Phases:** Planning, NEPA, design
- **Decision Points:** Multiple decision points, though particularly those in the COR and ENV phases

Definition

The Center for Environmental Excellence defines context-sensitive solutions (CSS) as a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist. CSS principles include the employment of early, continuous, and meaningful involvement of the public and all stakeholders throughout the project development process (*5*).

Constraints Addressed

A project's context includes the surrounding environmental and community resources, as well as the stakeholders' interests and concerns. Developing and designing a project that fails to respond to the surrounding constraints and opportunities can be a substantial factor in project delay. A design (and design process) that does not adequately address contextual constraints and opportunities can alienate community members and other stakeholders, result in higher impacts, complicate permitting, and increase project costs, all of which can delay project delivery.

This strategy can help to address the following constraints:

- Stakeholder controversy and opposition; and
- Insufficient public engagement or support.

Examples

Many sources of information on CSS and context-sensitive design (CSD) are available on the web (*5–9*). Designing projects that are more responsive to their physical and social surroundings is an increasingly common approach for transportation agencies seeking to develop projects that are less mired in controversy, less delayed by opposition, and that provide more than basic transportation benefits (added benefits include a broader set of transportation, as well as nontransportation, objectives). CSS principles can help projects to garner broader support, reduce mitigation expense, reduce permitting challenges, and improve integration with and benefits to surrounding communities and resources. Numerous project examples are available on the cited websites (*5–9*). Two examples described in the Chapter 4 case studies in this report include

- Nashville Gateway Boulevard corridor study. This project used CSD to garner widespread support from local businesses and other stakeholders in the surrounding Nashville downtown area.
- District of Columbia 11th Street bridges EIS. This document employed CSD principles to reduce impacts and increase benefits to the adjacent communities and resources (*10*).

Effectiveness

Schedule

The effect of CSS on a project's schedule is generally difficult to estimate. CSS can require additional time to collect data and engage with stakeholders, and it can involve some redesign as more information about context and concerns is gathered. Employing CSS principles from the beginning clearly saves time compared with changing direction later in the project process. To the extent that CSS helps to reduce public and stakeholder opposition, permitting complexity, and later mitigation needs, it will expedite delivery. Most project teams who have employed CSS principles report that they believe the approach reduced conflicts and rework, which reduced project delays.

Cost

Similar to schedule, the cost of this strategy depends on several factors. In the end, whether CSS adds or reduces costs will be determined by the difference between the additional cost of collecting data, understanding stakeholder concerns, and developing a design that is genuinely context sensitive versus the time and costs saved by reducing public opposition, reducing permitting needs, increasing public support, and improving broader community benefits.

Risks

CSS bears some risks. For some projects, avoiding impacts can add substantially to construction costs (e.g., including complex retaining walls in place of fill slopes to reduce a highway's footprint can add substantial cost). There is also the risk of inappropriately sacrificing transportation safety or operations to reduce resource or community impacts. It is important to consider the comprehensive risks and benefits of the various options. There is also a risk of creating unrealistic expectations with stakeholders.

Other Benefits

Adapting a project's design to attract support from stakeholder groups can show a transportation agency's willingness to listen and respond to a community's interests. This may improve the image of the transportation agency in the eyes of that community and foster support for other projects in their area. Also, CSS can reduce the risk of unanticipated permitting and mitigation costs and delay.

Applicability

CSS can be applied in the planning, NEPA, design, and construction phases of projects, and it is applicable to the development of broader transportation plans (FHWA's website and the sources cited above provide guidance). The fundamental principles of CSS are relatively universal, but the particular methods of engagement and design considerations and details will depend on a given project's or program's context. Agencies that already actively engage stakeholders and

are responsive to stakeholder input may more readily adapt to applying other CSS principles.

Strategy 4: Coordinated and Responsive Agency Involvement

- **Strategy Group:** External coordination and communication
- **Phases:** Planning, NEPA, design
- **Decision Points:** Any/all decision points

Definition

The need for permits and other regulatory approvals often increases the time required to complete the NEPA process, project design, and, of course, permitting. The more complex the permitting, the more it can extend project delivery. Poor coordination with resource agencies can be a substantial source of delay that can be avoided or minimized with adequate planning and effective implementation. Improving coordination with resource agencies and achieving more responsive involvement with them can be realized through a variety of techniques (see examples below). Involving agencies early (e.g., at the beginning of project scoping) often increases the odds of gaining more timely input and developing more effective relationships. However, involving agencies early is not enough: it is equally important to establish clear and direct communications, promote a culture of collaboration, understand agency needs and concerns, clearly convey project-related needs and concerns, and implement the project in ways that are responsive to project as well as agency needs.

Constraints Addressed

Large, complex projects generally require coordination with many local, state, and federal resource agencies, necessitating a well-defined and collaborative approach for their involvement. As the number of agencies involved increases, it becomes easier for some to feel marginalized if their concerns and interests are overshadowed by those of other agencies. A highly responsive coordination strategy can help to avoid this.

While this strategy typically is considered for projects requiring more complex permitting or reviewing needs, it can also help to streamline interactions on projects with minimal need for State Historic Preservation Officer (SHPO) review by establishing criteria for reduced timelines and process on projects less likely to affect Section 106 resources.

This strategy will also help to identify potentially conflicting assumptions concerning resource values earlier, when they are more easily addressed. Stronger collaboration with resource agencies throughout, and even before, the NEPA process can streamline their review of the environmental documentation as they will better understand the project and how it has developed, and the project will be able to proactively address their interests and concerns.

Consistent engagement with resource agencies can establish and maintain mutual agreement on the issues that are relevant to a project and avoid the diversion to inapplicable or less important topics that can occur when resource agencies are only sporadically engaged.

This strategy can help to address the following constraints:

- Unusually large scale of and/or complex project or program;
- Inefficient Section 106 consultation with SHPO;
- Conflicting resource values;
- Lengthy review and revision cycles;
- Inability to maintain agreement;
- Difficulty agreeing on impacts and mitigation; and
- Inordinate focus on single issue.

Examples

District of Columbia 11th Street Bridges EIS

The 11th Street bridges project team set an ambitious timeline to complete their EIS. To facilitate expedited EIS review and help project managers and stakeholders to better meet streamlining and stewardship objectives, the District of Columbia DOT (DDOT) secured the assistance of FHWA headquarters through the NEPA Teambuilding Initiative, which is administered by the FHWA Office of Project Development and Environmental Review (see strategy on aligning expectations up front). In addition to establishing relationships up front with resource agencies, DDOT and FHWA also developed and implemented a more effective and efficient interagency coordination process. They set up communication and coordination lines to expedite input and responses from those agencies. Interagency meetings were an important aspect of expediting agency coordination. DDOT already had a process established for other efforts and enhanced that process for the 11th Street project. This included taking the time to learn and understand key concerns and issues for each agency. Staff travelled to individual agency offices for face-to-face coordination (at least three briefings for each agency, including the Environmental Protection Agency [EPA], the U.S. Army Corps of Engineers, the National Capital Planning Commission, and others). DDOT had more frequent meetings with other agencies such as the National Park Service (NPS) and SHPO. Overall, DDOT found that it was most effective to solicit initial input and concerns from the agencies and then

propose an approach based on that initial input. Agency coordination was also expedited through early agreements developed through the NEPA team-building work. This allowed the various agencies to accomplish at least partial concurrent reviews of key project materials.

Oregon DOT Statewide Bridges Program

When Oregon DOT (ODOT) identified widespread problems with deteriorating bridges, they understood that the usual approach to permitting, environmental review, and agency coordination would not work for this program involving over 300 bridges. One of their first steps to establish a more efficient approach was to hold a workshop with resource agencies to let them know the problem they were facing, the objectives they wanted to achieve, and to ask the agencies for help in (*a*) understanding what goals and objectives the agencies would like to achieve as part of this program and (*b*) redesigning the coordination, review, and permitting process to achieve the objectives of ODOT and all the resource agencies. This led to substantial changes in the delivery process, including much more detailed and up-front environmental data collection; new programmatic permits; a batched biological assessment; a dispute-resolution process; agency leadership meetings and agreements; and an overall new review process that front-loaded data and analysis, was more collaborative, and was much quicker than the traditional approach.

Effectiveness

Schedule

This approach requires more labor up front and can extend the time taken to initiate agency coordination. The time savings are realized through a quicker NEPA process, quicker permitting, and less need to revisit and redo analysis or design work.

Cost

Higher agency coordination costs must be allocated up front and during project development. Coordination is generally more intense, which increases some labor costs. Cost savings are realized when the overall project is delivered faster and there is less need to revisit or redo previous work.

Risks

There can be a risk of creating unrealistic expectations. While this approach involves being more collaborative with resource agencies and more open to helping them meet their missions, it is important to ensure that resource agencies also clearly understand that the transportation mission must be achieved.

Other Benefits

Some DOTs have found that the mere act of committing to improving relationships with approval agencies and soliciting input from those agencies on what can be done to better meet their missions can facilitate the beginning of more effective relationships and more effective and efficient coordination. When this approach is done successfully for a single large project or program, the benefits can carry over into other work and lead to opportunities to develop additional strategies and improvements.

Applicability and Transferability

Making substantial changes to external coordination procedures and roles generally requires substantial effort, leadership, and organizational commitment. This makes this strategy much more applicable and appropriate to programs or large projects. It can be instigated as part of a single high-priority project or program, and then extended to become standard agency procedure.

This strategy is highly transferable, although when relationships with resource agencies are particularly adversarial, gaining the trust needed to start establishing more effective coordination will be more difficult.

Strategy 5: Dispute-Resolution Process

- **Strategy Group:** External coordination and communication
- **Phases:** Planning, NEPA, design
- **Decision Points:** Any/all decision points

Definition

An effective dispute-resolution process is typically accomplished through an agreement among the agencies involved. Having a clear process and agreement for resolving disputes can help agencies to avoid an impasse, recognize when they are at an impasse, and help to expedite the elevation and resolution of an impasse if and when it cannot be readily resolved at a staff level. A dispute-resolution agreement will typically

- Describe a process for identifying when dispute elevation is the appropriate next step;
- Describe how to initiate the dispute-resolution process;
- Identify two, three, or more levels of elevation to cover the range of issues that could arise and provide options at a variety of organizational levels for resolving them (e.g., some disputes can be resolved at the senior staff level, while others may need to be elevated to the agency executive);

- Identify the individual people or positions to which disputes will be elevated; and
- Describe a process for reviewing and modifying the resolution procedure as needed.

Constraints Addressed

Transportation projects, especially large ones, do not successfully advance without receiving significant approvals at various milestones. In addition, most projects also require a large number of smaller consents and agreements at multiple phases from many different stakeholders. Without these major milestones and frequent, small agreements and consents, a project cannot advance. When two or more agencies that influence the ability to advance a transportation project reach an impasse, progress can cease and schedules can be delayed. Such an impasse can occur between a transportation agency and a permitting agency, among permitting agencies, or among project sponsor agencies. Progress may be halted or slowed until the impasse is successfully addressed.

This strategy can help to address the following constraints:

- Issues arising late cause project change;
- Inability to maintain agreement;
- Inordinate focus on single issue;
- Avoiding policy decisions through continual analysis;
- Unusually large scale of and/or complex project or program;
- Inefficient Section 106 consultation with SHPO;
- Conflicting resource values; and
- Difficulty agreeing on impacts and mitigation.

Examples

Oregon DOT Bridges Program

More than 30 of the bridges that were part of ODOT's statewide bridge repair and replacement program were located on federal property administered by the U.S. Forest Service (USFS) or the Bureau of Land Management (BLM). ODOT had developed programmatic permits and a batched biological opinion to cover Clean Water Act Section 404 and 401 requirements, state wetland permit requirements, and Endangered Species Act (ESA) Section 7 consultation requirements for nearly all of the bridges in the 300+ bridge program. However, the added jurisdiction and permitting and approval requirements associated with federal lands were not necessarily or completely covered by these programmatic permits. In order to address the unique NEPA and other approval requirements for bridges on USFS and BLM lands, ODOT, FHWA, BLM, and USFS developed a memorandum of agreement (MOA). The MOA described the approach that would be taken to ensure that ODOT's NEPA approach would address the NEPA requirements of BLM and USFS and how other permitting requirements would be addressed. The MOA defined each agency's role and responsibilities as either lead or cooperating agency, and it specifically outlined a process for elevating and resolving disputes or issues that would arise during the approval process. The dispute-resolution process, which was developed in close coordination with USFS and BLM, specifically incorporated lessons learned by those agencies from their previous experience with dispute resolution.

Interstate Collaborative Environmental Process

At the initiation of the Interstate 5 Columbia River Crossing project, the Washington State DOT and ODOT gathered the various state and federal resource agencies from both states into a workshop setting. They worked with these agencies to establish a process for involving the agencies and to advance the project development process. All of the agencies signed the Interstate collaborative environmental process (InterCEP) agreement, which identified key milestones for formal consent or review, processes for coordinating, and a process for resolving disputes. This dispute-resolution process is described in detail in Section V, Part D, of the InterCEP agreement (*11*).

Maryland DOT Intercounty Connector

Maryland DOT and the Maryland State Highway Administration and partners use a dispute-resolution process that was especially effective for the intercounty connector project. Front-line staff were highly motivated to resolve issues and avoid elevating issues to senior staff unless absolutely necessary. Issues that were elevated were efficiently addressed through a resolution process that used a neutral facilitator.

Milton–Madison Bridge Project

This project partnered Indiana DOT and Kentucky DOT. A dispute-resolution process was important at several key points. Developing consensus among multiple agencies is often challenging, so it is crucial for a multiagency project team to develop a dispute-resolution process to avoid an impasse if debate becomes protracted. Team members on both sides understood early on that they would need to elevate some decisions to executive leadership quickly if they couldn't get consensus in the time frame needed to maintain their project schedule. This proved important when the two DOTs had to decide whether to restrict the project boundary to only the river crossing in order to complete NEPA 4(f) and Section 106 in time to receive funding from a federal stimulus program (the Transportation Investment Generating Economic Recovery [TIGER] program). In this case, the Indiana transportation

commissioner, in consultation with the governor, needed to approve removing some approaches on the Indiana side of the river from the project's scope.

Effectiveness

Schedule

Quickly resolving disputes and not letting them languish will directly reduce project delays and can expedite delivery.

Cost

Establishing a new multiagency dispute-resolution agreement will require additional effort and labor costs up front. This will result in overall cost savings when disputes are quickly addressed, allowing the project to continue to advance.

Risks

Some agencies have reported that their dispute-resolution process has not expedited resolving disputes. Agency staff had developed the perception that elevating a dispute was a sign of failure, and therefore they were very reluctant to elevate and would continually try to resolve the dispute at the staff level. This reluctance can be very effective as long as staff members from all the involved agencies are motivated to find quick resolutions. However, in other cases (as reported by USFS and BLM), this approach can result in increasingly entrenched positions and substantial delays in actually reaching resolution.

Other Benefits

In addition to helping expedite project delivery, an effective and participatory dispute-resolution process can also improve relationships among agencies, which can benefit collaboration on other projects or programs.

Applicability and Transferability

The benefits of an effective dispute-resolution process could apply to many types of projects and programs. It can be developed for a single large project and then expanded to broader programs, or it can be developed from the beginning to apply to multiple projects and programs. The typical successful approach for introducing a new method of dispute resolution appears to be through a pilot project or program.

The basic elements of a dispute-resolution process are transferable to other agencies, projects, or programs. The approach may need to be customized to address the particular constraints and opportunities of each project and of each agency involved.

Strategy 6: DOT-Funded Resource Agency Liaisons

- **Strategy Groups:** Commitments, external coordination and communication
- **Phases:** Primarily NEPA, final design
- **Decision Points:** Any/all decision points

Definition

Over the last decade, state and federal agencies have been pressed to accomplish more with less. Workloads have increased while staff resources often have remained flat or declined, a trend that has occurred at transportation and resource agencies alike. To increase efficiencies, many state DOTs have established partnerships with resource agencies and nongovernmental organizations, funding positions at these entities to perform environmental analysis and expedite project review.

According to a 2005 AASHTO–FHWA study for which researchers spoke to environmental managers at every state DOT (*12*), all DOTs that funded positions at resource agencies said the primary purpose of the positions was to improve project delivery and predictability and speed up the permit and consultation process. DOTs typically set goals for funded positions to

- Increase involvement in a timely fashion and reduce late interagency conflicts;
- Solve problems related to project delivery;
- Be a resource for the DOT regarding the regulatory requirements of the other agency;
- Establish a more workable and efficient process;
- Provide useful down-line results related to transportation decisions and environmental impact reduction, resource conservation, and preservation;
- Complete better-quality reviews, more quickly, to achieve scheduled project deadlines;
- Eliminate potential bottlenecks that could result from an agency's inability to respond to DOT needs in a timely manner;
- Eliminate problems that could occur late in the process by involving the appropriate agencies early to identify and work potential problems;
- Improve permit and consultation turnaround times through a more efficient coordination process;
- Keep things on track and get back on schedule quickly when the unexpected occurs; and
- Hire and retain permanent full-time equivalent employees at the resource agency who know the DOT's processes.

FHWA's 2009 *State Transportation Liaison Funded Positions Study* identified a series of benefits from liaisons (*13*). These included increased communication and dialogue among

agencies and helping to better link planning and environmental reviews. The liaisons also were critical in resolving conflicts and overcoming barriers between agencies. The study noted challenges for liaisons, including the unique mix of skills required for successful liaisons and the typically short-term job duration periods due to funding constraints.

More than 80% of state DOTs have some sort of DOT-funded external support underway for environmental purposes. About two-thirds of the states explicitly fund positions at other agencies. Fifteen percent fund other types of programs or partnerships, in addition to or instead of positions. Mapping, database development, and identification of sites for advance mitigation are among the most common services funded by partnerships. Similar efforts with nongovernmental organizations are growing.

Given their now widespread nature, DOT-funded positions or agency liaisons help to expedite many transportation projects. Liaisons and dedicated DOT employees conduct a variety of tasks to help comply with permitting, review, and consultation requirements under a variety of laws, including ESA Section 7, Clean Water Act Sections 404 and 401, National Historic Preservation Act Section 106, and U.S. Coast Guard bridge clearances, as well as state regulations. A few liaisons and DOT employees perform project inspection, erosion and sedimentation control oversight, or programmatic work as a primary portion of their job duties. Several DOTs reported plans to increase the use of DOT-funded positions at resource agencies to review projects and provide environmental input in the planning phase.

Constraints Addressed

Resource agencies are often short-staffed and have difficulty meeting desired turnaround times to review environmental documentation and to provide feedback and other information needed by the DOT to progress through environmental review and permitting.

This strategy can help to address the following constraints:

- Unusually large scale of and/or complex project or program,
- Inefficient Section 106 consultation with SHPO;
- Lengthy review and revision cycles;
- Slow decision making;
- Inability to maintain agreement; and
- Difficulty agreeing on impacts and mitigation.

Examples

The statewide bridge delivery program undertaken by ODOT relied on staff at resource agencies dedicated to coordination of transportation projects. Many of these staff positions were funded by ODOT to assist in the development of programmatic and batched permits with these resource agencies. In Florida, the Flagler Memorial Bridge project benefited from DOT-funded positions in several resource agencies (*4, 12, 13*). More information on this program is provided in a case study in Chapter 4.

Effectiveness

Schedule

North Carolina and Maryland reported they were able to accelerate the environmental review process by partnering with their state's Department of Environmental Protection to fund employees dedicated to reviewing DOT projects (*4*). According to the 2005 AASHTO and FHWA study on DOT-funded positions, DOTs reported positive outcomes from their funded positions, stating that they were able to

- Complete better-quality reviews more quickly and achieve scheduled project deadlines;
- Eliminate potential bottlenecks that could result from an agency's inability to respond to DOT needs in a timely manner;
- Eliminate problems that could occur late in the process by involving the appropriate agencies early to identify and work through such problems;
- Improve permit and consultation turnaround times through a more efficient coordination process; and
- Keep things on track and get back on schedule quickly when the unexpected occurred (*12*).

Cost

In the 2005 AASHTO and FHWA report on the effectiveness of DOT-funded positions, DOTs reported that positions were worth the cost by avoiding delays and improving interagency relationships (*12*).

Risks

Risks with the additional funded position include additional scrutiny of DOT projects and external perceptions that the environmental review process can be compromised by DOT involvement; however, safeguards for the latter are usually in place. For example, positions almost uniformly are located at the resource agency and report up through the chain of command at the resource agency.

Other Benefits

Some states reported that the permitting processes they had developed that were dependent on shared decision making among the agencies would come to a standstill without the DOT-funded positions. A number of DOTs indicated that they appreciated the qualitative improvements the positions afforded,

even when efficiency gains had not been documented. Better relationships between the agencies were often mentioned.

Applicability

This strategy is employed in some fashion in most states already and is clearly widely applicable across the country. It is worth noting that the effectiveness of DOT liaisons can be directly tied to the responsibility and authority the resource agency grants them. Liaisons will provide little benefit if resource agencies do not provide them with authority to make decisions, review and approve environmental documentation, and generally represent their agencies. In these situations, DOTs must continue to rely on other staff members at the resource agencies, who may not be able to provide the time and priority needed for transportation projects. Therefore, it is important for DOTs funding liaison positions to work with the respective resource agencies to ensure the liaisons are given enough authority and trust for them to provide effective coordination with the DOT.

Strategy 7: Early Commitment of Construction Funding

- **Strategy Group:** Commitments
- **Phases:** Planning, NEPA, design
- **Decision Points:** All decision points

Definition

The basic strategy is to secure construction funding early in the project development process (e.g., during the planning or NEPA phases) in order to demonstrate the level of commitment and high priority of the project or program. This demonstration of commitment also communicates that the project is real, because passing the construction funding obstacle greatly reduces the risk that time and resources spent on the project will be wasted. An early commitment of construction funds helps to garner the attention, time, will, and other commitments necessary to expedite decisions and delivery. Early funding indicates to all stakeholders that significant political support exists for the project and that the project is a very high priority.

Constraints Addressed

Agency staff, decision makers, the public, and stakeholders all have considerable demands on their time, and agencies have considerable demands on their resources. Projects that are not high priority, relatively imminent, or considered real are often not afforded the attention or commitment necessary to expedite. It is often difficult for a large project that has no construction funding secured (and therefore is at much greater risk of not being funded, or at least not being funded in the near future) to garner the broad and intensive commitments of staff time, decision-making will, political will, and other factors necessary to advance it forward in an expedited manner. It will often be relegated to a lower priority, even if not officially, than projects that have committed funds and are therefore more real and imminent.

This strategy can help to address the following constraints:

- Unusually large scale of and/or complex project or program;
- Insufficient public engagement or support;
- Lengthy review and revision cycles;
- Slow decision making;
- Inability to maintain agreement; and
- Lack of dedicated staff.

Examples

Oregon DOT's Statewide Bridges Program

During the early planning phase of the bridges program, the state legislature approved an increase in motor vehicle and trucking fees to provide full funding for the $1.3 billion bridge replacement and repair program. The key was that this funding was approved while the program was in early planning and had not yet initiated preliminary engineering or NEPA. This was one of several strategies that allowed the bridges in this program to be replaced or repaired in a fraction of the time required under the state's standard approach.

District of Columbia's 11th Street Bridges Project

The District City Council, in approving construction funds early in the NEPA process, also mandated that construction be complete within 6 years of the funding approval. This required that the NEPA process be completed in less than 36 months. DDOT staff did not necessarily perceive that the early funding commitment helped to expedite external decision making. However, the connection between funding and expedited delivery provided motivation and authority within the agency to at least ensure that internal agency actions were expedited and did not cause project delay. Early funding allowed DDOT to implement the NEPA process with a commitment to construction funding already in hand. For more information, see the 11th Street bridges case study (Chapter 4) and the project website (*10*).

Effectiveness

Schedule

The expediting benefits of up-front construction funding are difficult to quantify but are likely significant. The political

dialogue surrounding projects, especially very large projects that are not funded, often includes references to the fact that there are no funds to construct the project and therefore there is no need to rush decisions. This is often cited as a reason for delaying difficult decisions and extending timelines. The rationale is that since there are no committed or identified funds to build the project, there is time to gather more information, consider more alternatives, and delay decisions. With an early funding commitment, the risk that the project will not be funded has been eliminated, and the risk that delays could cause the project to exceed committed funds has been increased. This makes expediting much more compelling.

Cost

The primary cost savings are realized through expedited delivery and less time spent on reanalyzing, redesigning, and extended decision making. There is also a substantial cost risk associated with early funding decisions.

Risks

The primary risk associated with this approach is that construction costs are estimated very early in the process, and funding is established based on that early estimate. There is risk that the cost will increase as the project or program advances through the environmental and design process. It is very important that the early cost estimates used to establish construction funding amounts thoroughly incorporate risk assessment and cost validation to reduce the risks of cost overruns.

There is also a risk of predetermined outcome and violation of NEPA and other regulatory requirements. It is important to ensure that a range of reasonable alternatives are considered for the proposed action, even if the up-front funding was based on an assumed outcome of the alternatives analysis process.

Other Benefits

Up-front construction funding can provide expediting benefits to many aspects of project delivery, including staffing, permitting, public input, design, and decision making.

Applicability and Transferability

The benefits of up-front funding are applicable to many types of projects and programs. However, the greatest expediting benefit will be realized for a large program or megaproject for which the ability to secure construction funds is typically much more difficult and consequently there is a stronger perception that such a project isn't real until it is funded.

The basic approach is transferable. The specific process and actions necessary to achieve the political will to secure up-front funding will likely be unique in each location.

Strategy 8: Expedited Internal Review and Decision Making

- **Strategy Groups:** Internal communication and organization, decision making
- **Phases:** Planning, NEPA, design
- **Decision Points:** All internal decision points

Definition

This strategy establishes and implements a process for efficient and timely internal reviews and decision making. Obtaining formal commitments from each division and department to make decisions efficiently and quickly will help to establish this strategy as an accepted routine. All internal divisions and departments should agree to a clear process for considering and making decisions, including expediting the development and/or review of information needed to make decisions. Decision-making assignments should clearly specify who has the authority to make decisions or provide input on decision making for each division and department. Finally, each division and department should be accountable to meet or beat internal review and decision-making deadlines.

Constraints Addressed

Slow internal reviews and decision making can repeatedly stall progress and cause project delay. In addition, when the project proponent is slow to complete its own internal reviews and make decisions, this establishes a standard and sends a message to other agencies that project expediting is not a high priority. Projects are also delayed when internal decision points and responsibilities are not clearly understood or when the appropriate decision makers are not involved or prepared to make the necessary decisions.

This strategy can help to address the following constraints:

- Unusually large scale of and/or complex project or program;
- Slow decision making;
- Lengthy review and revision cycles;
- Ineffective internal communication; and
- Avoiding policy decisions through continual analysis.

Example

District of Columbia 11th Street Bridges EIS

The commitments of the DDOT staff and decision makers to expedite review and decision making were critical factors in expediting overall delivery of this project. This included a commitment on the part of the project manager to be widely accessible to project staff and agencies. It also included the commitment from agency decision makers to make decisions

quickly and efficiently. The project manager and other project leadership also agreed to conduct quick internal reviews. During the development of the draft EIS (DEIS), the department's project manager and other staff met biweekly with the consultant team. When the consultant DEIS was completed and delivered to DDOT, the department's project manager, key staff, and consultant leads met in a workshop setting, off site (to avoid distractions) for 3 days from 8 a.m. to 11 p.m. each day. They reviewed and discussed the entire document and resolved issues regarding all of the technical analysis and findings. At the end of the 3 days, the review and revisions were complete, allowing the revised document to be forwarded with recommendations to the DDOT directors. DDOT leadership committed to making quick policy and other decisions to keep the project advancing. At the beginning of the project, the project team met with DDOT senior leadership (chief engineer, department director, and associate director) to clarify policy directions up front and establish a process for efficiently gaining needed direction as the project progressed. When it was time to select a preferred alternative, they held a half-day workshop and emerged with a decision.

Effectiveness

Schedule

Expediting internal reviews and decision making can expedite project delivery. Many agencies note that their current process for reviewing and approving projects is more time consuming and cumbersome than necessary. Reviews and decision making are lengthened by the large number of divisions and individuals typically required to review, comment on, and/or approve multiple steps in the project delivery process.

Cost

Cost savings through reduced labor are possible when reviews and the decision process are more efficient. Implementing a project sooner rather than later can also help to alleviate the effect of inflation.

Risks

This strategy carries a risk of forcing decisions to be made without adequate information or involvement. This can cause setbacks and force agencies to revisit decisions, which can increase both cost and schedule.

Applicability and Transferability

Making substantial changes to internal procedures and roles generally requires substantial effort, leadership, and organizational commitment. This makes the strategy much more applicable and appropriate to large programs or large projects. It can be instigated as part of a single high-priority project or program and then applied more broadly within an agency.

Improving the speed and efficiency of internal reviews and decisions can be done in any agency, but it is not unusual to face internal opposition to any effort to change current procedures and existing roles and authority. This kind of opposition and concern is generally easier to overcome when the benefits of the change are clearly understood and needed and when the direction to change comes from agency leadership.

Strategy 9: Facilitation to Align Expectations Up Front

- **Strategy Groups:** Decision making, external coordination and communication
- **Phases:** Planning, early NEPA
- **Decision Points:** Multiple decision points

Definition

Aligning expectations from agencies and stakeholders early in the planning or NEPA process (during scoping) sets a foundation for expediting many aspects of project delivery. A facilitated process can be particularly successful.

When initiating a project involving a diverse range of agencies and/or major stakeholder groups, early facilitation can help early coordination among all parties to align expectations up front and reduce future delays from unanticipated issues of interest or concern. At the outset of the planning or NEPA process, the facilitator leads structured discussions with parties to elicit their ideas and priorities for the project, identifying any potential critical or fatal flaw issues that could be encountered, highlighting areas of common agreement, and noting issues on which parties may have conflicting agendas. A third-party facilitator can reduce the risk of a conflict of interest, but an effective and skilled facilitator from one of the involved agencies could also perform this function as long as he or she is viewed as adequately neutral and fair. An equally important part of these facilitated meetings is for the DOT and other lead agencies to identify their goals associated with the project and to explain the limits or constraints that they are under. These facilitated discussions are a valuable opportunity for the DOT to gain an early understanding of resource agencies' and stakeholders' interests, preemptively identify and address issues that may be outside the scope of the project, and align all parties' expectations at the beginning of the project, thereby avoiding potential delay from their concerns being raised later.

Constraints Addressed

Parties often enter the environmental review process with different missions, expectations, and points of view. These disparate perspectives can result in increasing amounts of conflict and protracted negotiations during the planning of, and NEPA evaluations for, transportation projects and when decisions are required that narrow possible outcomes. Poor understanding among stakeholders, resource agencies, and the transportation agencies of one another's expectations about the planning or project evaluation process can lead to increasing requests to explore alternatives or paths that many know are unrealistic and unlikely to come to fruition, but add time and expense to the planning or NEPA phases.

Typically, few resources are assigned to proactively attempt to align participants' expectations by helping them to articulate what they are seeking and to provide early feedback on what should be expected from the planning process or NEPA examination of alternatives.

This strategy can help to address the following constraints:

- Issues arising late cause project change;
- Stakeholder controversy and opposition;
- Conflicting resource values;
- Lengthy review and revision cycles;
- Inability to maintain agreement;
- Difficulty agreeing on impacts and mitigation; and
- Avoiding policy decisions through continual analysis.

Examples

Lower Manhattan Transportation Improvements

The Lower Manhattan transportation improvements in the wake of September 11, 2001, included several significant transportation projects to repair and improve traffic and transit infrastructure. In order for these projects to proceed simultaneously and in a coordinated fashion, FTA and other transportation agencies brought the many resource agencies and other key stakeholders together to engage in facilitated conversations aimed at identifying issues of interest and concern, to align parties' expectations, and to explain the goals and constraints on the program and the ensuing environmental process.

Colorado Shortgrass Prairie Initiative

At the outset of the Colorado Shortgrass Prairie Initiative, agencies met to discuss their aspirations and expectations with an internal facilitator—the manager of the Colorado DOT (CDOT) Natural Resources Unit. The team used an interagency MOA to record their understandings, what the initiative would accomplish, and the basic strategies they intended to use. Although this document was not reviewed by each agency's legal staff and signed by agency directors until later in the process, it served as a common reference point and governing document for the group from the beginning of the effort.

District of Columbia's 11th Street Bridges Project

The EIS and other aspects of the project benefitted from the NEPA Teambuilding Initiative administered by the FHWA Office of Project Development and Environmental Review.

Effectiveness

Schedule

This strategy can help projects to stay on schedule by clarifying coordination processes and roles; improving agency response times; and eliminating time spent on protracted conflicts, lobbying for individual priorities, and negotiating differences. It also helps to reduce the risk of unanticipated issues being raised from resource agencies and stakeholder groups late in the environmental process, allowing the project to address these potential bottlenecks earlier and thus reducing the possibility of delay.

Cost

Investing funds in facilitation and interagency coordination up front can raise costs initially, but this process can be valuable to the project overall, saving considerable time and expense in the end.

Risks

Aligning expectations is a delicate task that takes deep technical knowledge of regulations regarding what is allowable and possible; experience of what has worked elsewhere; and excellent skills in listening, eliciting interests, and explaining differences and possibilities. Without skillful application of this practice, participants could feel pressured or manipulated. It is important that the facilitator not only have facilitation skills, but also adequate knowledge of transportation and the environment.

Other Benefits

Up-front investments in aligning expectations generate other benefits, such as team building, improved communication, aligned interests—and greater willingness and readiness to act on those aligned interests—and moving projects along. Cobenefits can arise for other work or projects that team members pursue elsewhere with the same participants.

Applicability

This approach is transferable to nearly any agency and project. All projects would benefit from an up-front facilitated alignment of expectations. Projects that involve agencies with clearly competing agendas or that lack a history of effective collaboration are likely to benefit most from facilitated alignment of expectations.

Strategy 10: Highly Responsive Public Engagement

- **Strategy Group:** External coordination and communication
- **Phases:** Planning, NEPA
- **Decision Points:** Multiple decision points

Definition

Many agencies have successfully involved the public in long-range planning or have involved the public in project planning in ways that have garnered support and enabled expedited delivery rather than opposition and delay. Effective involvement anticipates and provides direct ways for participants to contribute to decisions and for them to see the outcome and how it was influenced by their input, thereby reinforcing the value of their participation and the responsiveness of the sponsor agency or agencies. Developing a process that is explicit about how input will be used is necessary for public participants to perceive agencies as credible, effective, and worthy of their time. Meaningful engagement reduces the chance that stakeholders will cause delay later on by raising new issues or concerns. Implementing more responsive public engagement goes beyond improving how transportation agencies communicate with public stakeholders. It can also include engaging the public in ways that influence how a project team collects data, describes existing conditions, and evaluates actions. These activities are reflected in an engagement and analytical approach referred to as community impact assessment (*14*).

A variety of methods have been successfully employed by DOTs and their partners to better engage the public. There is no single best approach, as public engagement needs to be tailored to the characteristics of the planning process or project and the community and stakeholders potentially affected by it. Recently, several states have implemented different public engagement strategies that have resonated positively with participants and resulted in less arduous public engagement efforts. Some of the lessons that have been learned by DOTs and metropolitan planning organizations (MPOs) with regard to successful implementation of highly responsive public engagement are summarized in the NCHRP report *Technical Methods to Support Analysis of Environmental Justice Issues* (*15*).

Constraints Addressed

Failure to effectively involve the public or respond to public concerns can lead to considerable project delays when stakeholders question or challenge previous decisions, request new analysis, request new alternatives not previously considered, or otherwise cause a project to be forced into redoing work or reopening previous decisions. Unresponsive involvement also tends to degrade public trust.

Obtaining public participation can be difficult unless people see how they will be directly affected by a project. Participation from minority and low-income neighborhoods can be further hampered by cultural or socioeconomic barriers, lack of transportation, and/or perceived disempowerment. Thus, agencies will usually need to make an extra effort to reach out to low-income and minority communities. Many state DOTs and MPOs say that enhancing and expanding public engagement activities are primary components of their environmental justice efforts.

DOTs and MPOs are frequently challenged by attracting public interest and involvement when discussing possibilities that may be 10 or more years in the future. The conventional wisdom is that the public gets more involved as projects become more definite and closer to their backyard.

This strategy can help to address the following constraints:

- Issues arising late cause project change;
- Stakeholder controversy and opposition;
- Unusually large scale of and/or complex project or program;
- Relocation process delays construction;
- Insufficient public engagement or support;
- Negative or critical coverage from the media; and
- Inability to maintain agreement.

Examples

Oregon I-5 Beltline Project

This project used a uniquely structured approach to include stakeholders in the decision-making process, bringing together people who held polarized positions to identify issues and develop performance criteria based on community values. Using decision-support software to evaluate and compare alternatives, the stakeholders were able to strongly influence and ultimately alter the outcome. FHWA and ODOT went beyond the customary degree of shared decision making with local governments, even though statutorily they were responsible for the final decision.

Caltrans

Caltrans renamed its planning branch "Collaborative Planning" to emphasize the "multi-agency, interjurisdictional

planning that integrates land use and infrastructure planning to meet the community's needs while addressing economic development, environmental protection and equity" (*16*). Collaborative planning includes community involvement to ensure that development meets the vision and needs of the residents of the region. It involves early involvement of stakeholders and sharing of data. New graphic techniques for displaying the results of land use decisions enhance community involvement and integrated planning.

For Caltrans, the immediate goal of collaborative planning is to expedite transportation project delivery by streamlining the environmental review and permitting process. This requires new methods and processes that will bring resource agencies into the transportation planning process much earlier than the NEPA process does in the typical project delivery process. Collaborative planning involves developing new partnerships and ways of doing business. Corridor-level environmental studies that combine transportation planning with habitat and conservation planning, corridor-wide programmatic mitigation agreements, and improved environmental consideration in the long-range regional transportation plans may all be parts of the solutions. Influencing local land use planning and the regional jobs–housing balance is also within the scope of the collaborative planning effort.

In a study of CA I-710 from the ports of Long Beach and Los Angeles, the Tier 2 community advisory committee report identified and recorded neighboring communities' priorities, which set the parameter for the project to a degree that would have been unusual previously. These priorities clearly state that (*a*) this is a corridor—considerations go beyond the freeway and infrastructure; (*b*) health is the overriding consideration; and (*c*) every action should be viewed as an opportunity for repair and improvement of the current exposure to air toxins, largely from diesel particulates and truck traffic (*17*).

Airport Parkway and MS-25 Connector Project

For this Mississippi project, the strategic and action plan for communication and community involvement was an asset to the project. The use of feedback from local neighborhood residents provided the opportunity to receive input related to the public engagement program and project alternatives. The agencies learned that documenting public input and reporting back to the community on the implementation of residents' suggestions is critical to gaining their support. This feedback gave residents the assurance that their input was seriously considered and that they were part of the decision-making process. Municipal coordination also provided local cohesiveness and minimized potential delays (*18*).

District of Columbia 11th Street Bridges Project

Instead of holding traditional public meetings, DDOT held workshop-like meetings with the public from the beginning of the NEPA process so that community members could have meaningful dialogue and instant feedback. These meetings followed from the public involvement that occurred during the earlier planning phase. The workshop approach increased the awareness and knowledge of the public and helped the project team to better understand specific community concerns and hopes for the project. For the initial meetings the team brought in maps and aerial photos with no proposed designs. Although they had previously developed concepts, they indicated their willingness to consider any and all concerns in developing the project. They sought to elicit community input on what was important to the community and what ideas they had for addressing issues. Separate meetings were initially held with communities on different sides of the river because their issues were different. Later community meetings were combined, which allowed the different communities to better understand the variety of concerns in various neighborhoods and among various stakeholders. The project team formed a citizen advisory committee representing the different neighborhoods and groups and ran issues and information by the committee before going public in order to gather input on how best to convey and solicit information and input. Communities on the west side were initially opposed to the project, but the intensive involvement helped the project to develop a preferred alternative that addressed many of their concerns and was ultimately supported by most groups. There were few opponents and many supporters by the end of the NEPA process (*10*).

Kangley–Echo Lake Transmission Line

The Bonneville Power Administration worked closely with neighborhood groups, landowners, and the City of Seattle to craft a unique mitigation package. The team added analysis on additional alternatives to address specific concerns from stakeholders. The results of this involvement were a series of agreements and specific mitigation measures documented in the final EIS (FEIS).

I-94 North–South Project Freeway Project

The project held numerous block parties throughout the urban portion of the study area. The block parties were held in the evenings midweek to engage residents and to provide more information about the project. The project also canvassed the neighborhood by dropping off project information. The primary public concern was a fear of expanded right-of-way that would force relocations. The project worked

with stakeholders and made a commitment of no net increase in right-of-way. This addressed the primary concerns and kept relocations to a very low level.

Effectiveness

Schedule

Public involvement can both shorten and extend project schedules. If begun early, effective notification, discussion, brainstorming, and resolution of issues tends to increase schedule reliability and reduce the risk of delays from public resistance and the introduction of new issues and concerns late in the process.

Cost

Responsive public engagement generally incurs additional cost because of additional staff time for managing the public process. However, it will typically reduce the risk of costly delays.

Risks

Greater public involvement tends to minimize risk, but involvement also reveals different opinions, which must be respectfully engaged and addressed. There is also the risk of creating unrealistic expectations. It is important to be clear from the beginning that the public's role is advisory and that elected officials and department leaders are charged with making the ultimate decisions.

Other Benefits

More meaningful public engagement can help to develop and maintain positive and respectful relationships with the public that can generate good will and trust going into future projects. This can potentially make public engagement easier as DOTs develop a positive rapport with their constituencies (*19*, *20*).

Strategy 11: Incentive Payments to Expedite Relocations

- **Strategy Group:** External coordination and communication
- **Phase:** Final design
- **Decision Points:** Post ENV-11 and PER-6

Definition

Awarding payments beyond traditional relocation costs to tenants, property owners, and/or business owners who relocate within certain time frames can expedite the relocation process. These payments are in addition to relocation assistance benefits, and they can provide an incentive for tenants or property owners to complete their move quickly. Tenants must meet strict time frames established by the transportation agency in order to qualify for the incentive payments.

Constraints Addressed

Relocation processes can delay construction. Property acquisition and the relocation of residents or businesses are often on the critical path to beginning construction, which adds pressures on the transportation agency to quickly negotiate replacement housing payments and other settlement issues that must be completed during the relocation process. This process can be stressful for tenants or business owners, who generally have different motivations than the transportation agency, which can lead to protracted negotiations and delay relocation and subsequent project activities. With the relocation process frequently on the critical path to construction, and the direct implications of delay to cost, transportation agencies will often benefit from techniques that expedite relocations.

This strategy can help to address the following constraints:

- Relocation process delays construction;
- Insufficient public engagement or support;
- Stakeholder controversy and opposition; and
- Negative or critical coverage from the media.

Examples

The Virginia DOT successfully employed this strategy on the Woodrow Wilson Bridge project, and has more recently used it on the I-66 interchange in Gainesville. Several other states, including Michigan and Florida, have also used incentive payments to expedite the relocation process.

Effectiveness

Schedule

This strategy can directly reduce the duration of the relocation process by providing an incentive for tenants or property owners to move within specified time frames. The degree to which this strategy affects the schedule is based on many factors, including the stipulations of the incentive program, various factors that influence the rate at which tenants take advantage of the program, and how the relocation process aligns with other elements of the project influencing construction.

Cost

The cost of this strategy varies based on the incentive amounts and the number of tenants who are able to receive payment. Since this is a discretionary approach, the project sponsor agencies control the payment structure. Generally, the intent

of this strategy is to avoid the significant costs associated with construction delay, which generally more than offset the cost of the incentive program. In the case of the Woodrow Wilson Bridge project, the Virginia DOT spent approximately $1.1 million on incentives to relocate residents 7 months earlier than originally planned, saving approximately $6 million in construction costs.

Expediting the relocation process by implementing an incentive payment program will require increased staff to administer the program and process the payments.

Risks

There is always the risk that some tenants will not take the incentive payment, delay the relocation process, and jeopardize the advancement of the project. Also, there is the risk of implementing the program and spending the incentive money, only to have another element of the project delay construction, so that the incentive money was spent without the intended benefit of expediting the start of construction. Finally, there is the risk that the use of incentives sets expectations for future projects, making other property owners expect incentives.

Other Benefits

Carefully publicized relocation incentive payment programs can defuse mistrust and antagonism from both the public and the press concerning the potentially disruptive nature of transportation projects and can contribute to on-going public good will for future transportation projects.

Applicability

This strategy is most useful when the relocation schedule will directly affect future time-sensitive activities, such as construction. This is most likely on projects with factors that make the relocation process more complex and time consuming, such as a high number of relocations and a lack of replacement housing or business sites. Ultimately, this strategy is only applicable in situations in which expediting the relocation process will save money by advancing subsequent tasks.

It is worth noting that applying this strategy selectively is preferable to adopting it as a policy. Though incentive relocation programs have been used in several states, they are employed selectively on projects that would benefit from the potential time saving more than the expenditure of the incentive payments, and most agencies do not want this approach to become a standard operating procedure. FHWA issued a policy memorandum providing guidance for evaluating, approving, and implementing incentive programs for federally funded transportation projects.

Strategy 12: Media Relations Manager

- **Strategy Group:** External coordination and communication
- **Phases:** Any or all phases, though particularly COR and ENV
- **Decision Points:** Multiple decision points, though particularly those in the COR and ENV phases

Definition

This strategy employs a project-level staff person with significant career experience in journalism to effectively manage how the project communicates with the media and avoid some of the difficulties transportation agencies sometimes encounter when their projects are misrepresented or misunderstood by the press. This position's project-level focus is a key distinction from staff within state DOTs and MPOs who specialize in public affairs and media relations for a variety of issues and projects within their agency. The primary function of this position is to develop a strategy for working with the media and to implement this strategy consistently throughout the life of the project. Media relations managers work closely with project engineers, planners, and scientists to maintain a strong understanding of the technical issues involved in the project so that they can communicate this information to the press according to their media involvement strategy. Media relations managers should have extensive contacts within the local media community to help them anticipate potential pitfalls by identifying hot-button issues with local journalists and their publications.

Constraints Addressed

Projects often encounter challenges when media coverage highlights or stokes controversy and opposition. A variety of factors can create or contribute to these difficulties. Project leaders can fail to anticipate hot-button issues with local media outlets or stakeholder groups, or they can identify them but not develop effective methods for addressing these issues or working with these groups. Transportation agencies often struggle to communicate information, either in meetings or via press releases, that both anticipates and clearly addresses topics of potential interest and concern to the press and their public audience.

This strategy can help to address the following constraints:

- Stakeholder controversy and opposition;
- Relocation process delays construction;
- Insufficient public engagement or support; and
- Negative or critical coverage from the media.

Example

The Milton–Madison Bridge project hired a dedicated media relations manager with significant career experience in the news industry as a reporter, producer, and news director who helped to anticipate potential pitfalls with reporters; as a result, the project was prepared to proactively address these issues instead of respond to them after they had already sparked controversy.

Effectiveness

Schedule

Employing a media relations manager can help a project to avoid the setbacks and delay that often occur if media coverage turns sour. It is difficult to measure the effect of this strategy, as its success will be evident in how easily a project interacts with the media and whether their coverage helps foster support or encourage opposition. However, almost any project is susceptible to delay if the media misunderstand the project's purpose, process, or the reasons underpinning decisions. Projects with high visibility, preexisting controversy, and/or public significance are most vulnerable to difficulty with the media and thus most likely to receive the benefits of this strategy.

Cost

The cost of this strategy is chiefly the money to staff a media relations manager position on a project, and it will vary depending on the time commitment needed from this individual. In some cases, this cost can be minimized if the position overlaps with other roles that are more common on projects, such as a public involvement specialist. If the position does include traditional public involvement duties, it is distinguished by the journalism experience of the individual filling this role.

Risks

The principal risk associated with this strategy is that the media relations manager could mischaracterize the project to the press. Because this position's key characteristic is career experience in journalism, individuals filling this role may not have much experience specific to transportation and the issues encountered on projects undertaken by DOTs or MPOs. This is one of the reasons it is important for media relations managers to be project-specific so that they can spend the time needed to have a broad and nuanced understanding of the project. It is critical for media relations managers to know all the main issues on their project and the reasons for the approaches adopted by the project team. If media relations managers do not take the time to get up to speed, they will be less effective and could even be counterproductive if they miscommunicate with the media.

Other Benefits

Effective communication with the media not only reduces the likelihood of poor coverage, but also encourages a more productive public dialogue about a project. As the press and their public constituency gain a better understanding about a project's purpose and process, they become better equipped and more inclined to provide constructive insight about community resources, interests, and concerns that can ultimately allow for better design and evaluation of alternatives.

Applicability

This strategy is most applicable to projects that are high profile or controversial, and thus more likely to run afoul of the media. Smaller projects may not see enough benefit to justify the added expense of a new position, but some of the benefits of this strategy could be obtained if an existing position is filled by staff with some media experience.

Strategy 13: Performance Standards

- **Strategy Groups:** Analysis, external coordination and communication
- **Phases:** Planning, NEPA, permitting
- **Decision Points:** Multiple decision points

Definition

An outcome-based performance standard is essentially a term or condition inserted into a permit or approval that describes a specific measurable outcome from a project activity. For instance, rather than arguing about the best management practice that the permit will prescribe, the agencies involved agree that the permit will specify that the proposed activity will not result in greater than X amount of pollutant discharge. In many cases, the X that is being committed to is already fixed by regulation (e.g., this is the case for most water quality issues). In these instances, outcome-based performance standards are particularly useful at keeping permitting discussions on track. However, even when the outcome is not specifically prescribed by regulation, discussions with stakeholders are generally more productive when the parties discuss desired outcomes. Successful performance standard development requires two key components. First, the performance standard outcome must be clearly measurable through

an agreed-on method. Second, no performance standard should be agreed on without review by appropriate representatives from DOT design, construction, and maintenance staff.

Constraints Addressed

Discussions associated with obtaining necessary permits and approvals frequently slow project timelines. Discussions can become bogged down over design details or an inability to agree on the likelihood or anticipated scope and scale of impacts. Having the permitting process get fixated on design details makes it difficult for engineers to make progress and can strain project communication. Instead of being focused on discussing desired outcomes, the project staff get stuck on debating how much impact a particular design is likely to have. Often these discussions have environmental staff acting as intermediaries between project engineers and regulators, and project engineers debating the projected environmental impacts. This is not only inefficient, but puts project staff in the position of debating issues well outside their areas of expertise.

Discussions around acceptable design stall for two main reasons. First, when a design standard is being used as the basis for a permit condition, the resource agency assumes the risk that the design will work properly. If it does not, the resource will be affected, but the DOT will still be in compliance. Resource agencies are typically risk averse. Accordingly, the resource agency is going to require a high level of assurance and will typically seek to overdesign the project to minimize the risk to their resource. Second, often stakeholders (regulators, nongovernmental organizations [NGOs], and interested citizens) enter a process with assumptions or perceptions that they are not willing to give up, no matter how much evidence is presented. In these instances, continuing to argue over the likely effects is fruitless.

This strategy can help to address the following constraints:

- Unusually large scale of and/or complex project or program;
- Conflicting resource values;
- Inordinate focus on single issue;
- Difficulty agreeing on impacts and mitigation; and
- Stakeholder controversy and opposition.

Example

Oregon Statewide Bridges Program

ODOT used outcome-based performance standards as the basis of their permitting strategy for the statewide bridge repair and replacement program, which followed Oregon's requirements for natural resource programmatic permits.

Effectiveness

Schedule

This strategy can reduce project delivery duration by streamlining project negotiations, cutting through potentially intractable conversations about design details. The strategy provides clear performance objectives to project engineers early in the process, while allowing flexibility as to how they achieve the required outcomes.

Cost

There is no increase in costs associated with this strategy. The focus is on restructuring the nature of conversations that are already happening. Ultimately, this strategy should result in a cost savings by preventing project discussions from bogging down on details and by eliminating inefficient and unproductive communication.

Risks

The use of outcome-based performance standards is a risk-shifting strategy. Accordingly, using an outcome-based performance standard requires that the DOT project leaders truly believe that their proposed designs will result in the level of impact projected. If the engineers or project planners are wrong, then the DOT is at risk of being out of compliance and potentially having to invest significant amounts to rectify their noncompliance issues.

Other Benefits

Use of outcome-based performance standards can improve project communication. The environmental staff talks to regulators about environmental outcomes, which is what they know and understand. Further, the environmental staff coordinates with engineers about what environmental avoidance and minimization are feasible for the project design to achieve, which is again the proper conversation for them to have. ODOT made additional use of this strategy to integrate their permitting processes by creating a single set of performance standards to which all relevant agencies agreed.

Applicability

This strategy is most effective when the parties honestly do not agree on the anticipated effects associated with a proposed activity or when the resource agencies are especially risk averse and unwilling to agree to permit terms and conditions without considerable assurances. Essentially, this strategy cuts through agency angst by shifting the risk associated with project design.

Strategy 14: Planning and Environmental Linkages

- **Strategy Group:** Decision making
- **Phases:** Planning, NEPA
- **Decision Points:** Multiple decision points

Definition

The NEPA phase can be expedited by using work and decision making done during prior planning studies. Planning studies often produce valuable data, analysis, and decisions that can be leveraged during the NEPA process to reduce the time and effort required to develop a range of alternatives, evaluate alternatives, and produce environmental documentation. Implementing this strategy requires two underlying steps. First, the planning studies must be conducted in a manner that produces both data and decisions that can be relied on during the subsequent NEPA process (i.e., appropriate public and stakeholder outreach and screening alternatives using relevant environmental considerations). Second, the lead agencies must decide at the outset of the NEPA (scoping) process to use data from prior planning efforts in order to effectively implement this strategy.

Constraints Addressed

This strategy addresses two primary obstacles. First, it is common for the planning phase to lack adequate data and analysis to build a base for conducting an efficient NEPA process. Second, when substantial work (data collection, stakeholder involvement, analysis, and/or screening) does occur during planning, it is frequently not well utilized during the NEPA phase because the early planning work is typically conducted by a different division and different staff from the NEPA phase, and there is often substantial time elapses between when the analysis is conducted and when the NEPA phase begins.

This strategy can help to address the following constraints:

- Issues arising late cause project change;
- Stakeholder controversy and opposition;
- Lengthy review and revision cycles;
- Difficulty agreeing on impacts and mitigation; and
- Inability to maintain agreement.

Examples

US-95 in Nevada

The relatively short time frame of 33 months for completing the NEPA process was largely attributable to the earlier planning study produced in cooperation by the Nevada DOT (NDOT), Clark County, the Cities of Las Vegas and North Las Vegas, and the Regional Transportation Commission. The planning study focused the involved parties on the pertinent corridor issues in advance of the NEPA process, enabling the issues to be addressed promptly and effectively and for this progress to carry over once NEPA was initiated. A key to successfully transferring progress from the planning study into the NEPA process was the consistent involvement of these agencies throughout both the planning and NEPA phases. Agencies that were key participants in the NEPA process had the advantage of having already worked together on the earlier study. Therefore, they were better equipped to coordinate with each other and complete tasks in a timely fashion due to the knowledge and availability of resources. NDOT's environmental manager emphasized the importance of getting the players assembled early to work out any issues and to sort out and eliminate the poor alternatives (*21*).

Mississippi DOT's Airport Parkway

Along with the MS-25 Connectors project, the Mississippi airport project's draft and final EIS documents were prepared and approved quickly and relatively smoothly due to the significant amount of work completed during the environmental assessment (EA) phase, even before the decision to produce an EIS rather than an EA. According to the Mississippi DOT environmental manager at the time, "Early and thorough coordination is a valuable lesson, plus the good fortune that there were no delays due to unanticipated discoveries." The DOT also built on the substantial information available from the earlier feasibility studies. Spending adequate resources to prepare the necessary environmental analyses early on was a key factor in the success of the project (*18*).

Maryland's US-113

A major reason why the formal NEPA process was completed in under 15 months for this project was the fact that NEPA-type studies were initiated in advance of the filing of the notice of intent. Since the purpose and need and alternatives identification occurred before the official start of NEPA, as had most of the environmental inventory work and impacts assessment, it became a relatively small task to transfer all of the pertinent information into the EIS in just 3 months. This allowed the formal NEPA process to proceed relatively quickly, although the technical studies related to preparation of the EIS are not actually taken into account as part of that process (*22*).

I-94 North–South Freeway Project

This project relied on previous NEPA and planning work to limit the issues that required full analysis in the EIS. The team reevaluated a previous EA for interchanges and found that the analysis for all but one of the 13 remained appropriate and usable in the EIS (*23*).

District of Columbia's 11th Street Bridges EIS

During the planning phase of this project, DDOT engaged the public, collected considerable data, and analyzed the transportation issues and community issues. They used this information to formulate responsive concepts for the project, develop cost estimates, and secure local funding. They moved quickly from planning into the NEPA phase and completed the NEPA process in 34 months (*10*).

Effectiveness

Schedule

Leveraging work done during the planning phase can provide significant time savings during NEPA evaluation. Project leaders who use this strategy can avoid redoing analyses and revisiting prior decisions and can also reduce redundant coordination with stakeholder groups, resource agencies, and the public. It also increases the likelihood that the NEPA phase will begin with concepts that are responsive to public interests, transportation needs, and environmental concerns (*24–28*).

Cost

Detailed planning studies will likely require additional funding up front to ensure proper documentation, stakeholder involvement, data gathering, alternatives evaluation, and decision making so that this work can be relied on during subsequent NEPA studies. The cost savings result from time savings and reduced repetition when planning studies are leveraged in the NEPA phase.

Risks

In general, conducting planning in a fashion that produces results more readily usable for NEPA reduces the risk that major new issues or alternatives are raised or that decisions are revisited. If a project is stalled for a long period after the planning phase, there is a risk that the work conducted during planning may expire and will need to be redone.

Other Benefits

Avoiding redoing work or revisiting decisions can make the progression through planning and NEPA appear more responsive and efficient to the public and stakeholder groups as they are not asked to weigh in twice on the same issues.

Applicability and Transferability

This strategy has wide applicability and transferability but could be difficult to implement in some situations. Allocating funding up front is necessary to be able to conduct more work during the planning phase, and this can be out of sync with funding procedures at some agencies. Integrating the planning phase and the NEPA phase can tread on the turf of different divisions and may cause internal resistance or outright opposition; modifying the project development process so that projects move quickly from planning to NEPA would be a relatively significant change for some organizations.

SAFETEA-LU now requires many of the activities previously considered good practice as mandatory measures to strengthen consideration of environmental issues and impacts within the transportation planning process and to encourage the use of planning products in the NEPA process. In particular, Sections 3005, 3006, 6001, and 6002 of SAFETEA-LU require consideration of the environment in both statewide and metropolitan planning. Section 6001 made two significant changes that require a heightened consideration of environmental issues in the planning process. These are (*a*) the need to include a discussion of environmental mitigation activities in the state and metropolitan long-range transportation plans and (*b*) the need to consult with state, local, and tribal agencies, which includes a comparison of transportation plans with resource plans, maps, and inventories.

SAFETEA-LU also requires that long-range plans include a discussion of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan. Such mitigation strategies must be developed in consultation with federal, state, and tribal wildlife, land management, and regulatory agencies and include avoidance, minimization, and mitigation strategies to address impacts to both the human and natural environments. In addition, the regulations state that the discussion of environmental mitigation activities may focus on policies, programs, or strategies, rather than specific projects, in both the statewide and metropolitan planning processes.

Many DOTs have developed guidance to meet SAFETEA-LU requirements to provide strategies that protect and enhance the environment and discuss potential environmental mitigation activities in the long-range plan. FHWA's guidance and that of several DOTs may be useful to those DOTs that have not developed their own process.

Strategy 15: Planning-Level Environmental Screening Criteria

- **Strategy Group:** Analysis
- **Phase:** Planning
- **Decision Points:** Multiple decision points

Definition

Since environmental factors play a key role in NEPA, early environmental analysis at the planning level is widely recognized as an important tool for streamlining subsequent project development. However, assessing the wide range of environmental issues addressed during project design and NEPA can be challenging as DOTs and MPOs often lack data and the tools necessary to consistently consider them during broad planning studies.

Planning-level environmental screening criteria ideally stem from the implementation of SAFETEA-LU Section 6001: Environmental Considerations in Planning. Under Section 6001, early consultation on resources and mitigation provides an opportunity to identify criteria and develop tools and understandings for project delivery. Implementation of this requirement is well underway; notable examples are the San Diego Association of Governments and the Minnesota Department of Transportation (*29*). Section 6001 requires transportation planning to consult on land use and environmental, natural, and cultural resources issues. Compliance with the section also requires consideration of potential mitigation options and consideration of resources that provide the best opportunities for protection.

GIS data and software analysis tools allow DOTs and MPOs to efficiently integrate environmental evaluations into their planning studies. By developing statewide and/or regional data, transportation agencies can quickly evaluate and compare proposed projects and programs, identify potential environmental hurdles, and make better-informed decisions about how to develop future projects.

The development of early environmental coordination tools includes the development of plans around green infrastructure. An example of this is the Baltimore Regional Transportation Board's GreenPrint program. GreenPrint provided transportation planners with an overlay of critical environmental resources and transportation corridors (*30*). These data products allow for structured consultation and assist mitigation conversations.

As part of the state's collaborative and GIS-supported efficient transportation decision-making (ETDM) process, Florida DOT (FDOT) has implemented statewide and district-level planning support capabilities that have introduced comprehensive consideration of environmental criteria in assessing proposed projects in the state's 20-year long-range plan, 6-year work program, and state transportation improvement plan. In addition to its proficient use of GIS data, the ETDM approach is successful because it establishes specific protocols for coordination, communication, analysis, decision making, and dispute resolution during the planning phase and later phases (*31, 32*). This process is discussed in much greater detail in the Flagler Memorial Bridge case study.

Constraints Addressed

Planning processes that do not properly evaluate environmental considerations produce results that may require additional time and cost during subsequent NEPA studies. The selection of future projects and the development and screening of potential alternatives during planning are less valuable and reliable to NEPA studies if environmental factors were not fully integrated into the decision-making process. The ability for planning work to be leveraged in the NEPA phase is largely contingent on whether and how the planning process considered the wide variety of environmental concerns that must be addressed during NEPA (*29–32*).

This strategy can help to address the following constraints:

- Issues arising late in cause project change;
- Inefficient Section 106 consultation with SHPO;
- Conflicting resource values;
- Lengthy review and revision cycles;
- Difficulty agreeing on impacts and mitigation; and
- Inability to maintain agreement.

Effectiveness

Schedule

Project development and NEPA studies can be streamlined by effectively leveraging the analysis, coordination, and approvals completed during the planning-level studies. This strategy reduces the likelihood of needing to revisit planning decisions about screening alternatives and results in planning documentation that is more readily used and referenced during NEPA. Florida's ETDM process has generated a cumulative time savings of more than 38 years across 50 projects, 47 of which are now in the project development and environment or later phase.

Cost

This strategy should reduce the cost of individual projects that are streamlined as described above. However, there can be significant up-front costs to develop and gather environmental data across large geographies, to reengineer existing procedures, and to maintain the required ongoing commitment for coordination with local jurisdictions and data gathering to keep information up to date. Ultimately, more effort and cost spent to build and maintain capabilities to evaluate a wide range of environmental criteria at the planning scale will make this strategy more valuable. Florida's ETDM process has generated cost savings of approximately $15.2 million across 50 projects.

Risks

Although evaluating environmental considerations early, during planning, can help DOTs and MPOs reduce their risks later by identifying potential issues of concern or fatal flaws before they make commitments to developing a project and beginning NEPA documentation, there is a risk that analysis and decisions from the planning phase could be considered outdated if projects are significantly delayed between the planning and NEPA phases.

Other Benefits

Assessment and consideration of environmental criteria can make planning studies more meaningful, not just for the DOT or MPO, but also for resource agencies, stakeholder groups, and the general public. Evaluating environmental factors that interest these groups can make their members more willing to engage in planning studies, which often struggle to maintain active participation.

Applicability

Environmental screening criteria in planning and programming are gaining acceptance as an expediting tool that can be implemented anywhere.

Strategy 16: Programmatic Agreement for Section 106

- **Strategy Groups:** External coordination and communication, analysis
- **Phases:** Planning, NEPA (the programmatic instrument must be developed before the NEPA phase, and often before the planning phase)
- **Decision Points:** Most ENV/PER points, though particularly ENV-4, ENV-5, ENV-7/PER-4, ENV-9, and ENV-11/PER-6

Definition

Section 106 compliance can be streamlined by developing a programmatic agreement among the applicable federal lead agency (e.g., FHWA), the SHPO, the state DOT, and the Advisory Council on Historic Preservation (ACHP). The specific language in a programmatic agreement will differ among states, but there are two important types of provisions that have proven useful at reducing the potential delay that Section 106 consultation can incur on transportation projects. First, the programmatic agreement can delegate some authority to the state DOT to conduct Section 106 reviews on behalf of FHWA. The delegation of Section 106 authority can include determinations of eligibility, findings of effects, and resolution of any effects. A second type of provision that is often included in a programmatic agreement is the identification of certain classes of projects or types of activities that do not need to go through the traditional individual consultation process with SHPO. Instead, such projects can go through a reduced or less formal SHPO review process, or simply be reviewed by qualified DOT staff.

Constraint Addressed

Most DOT projects have little or no potential to affect historic or archaeological resources, but are nonetheless often subject to project-by-project review from SHPO. These reviews can add time and expense to these projects and sap resources in the agencies that might otherwise be better used on projects with more likelihood of affecting resources protected by Section 106. The traditional approach of submitting most DOT projects and activities to SHPO individually for review and comment is generally inefficient and may ultimately inhibit agencies from providing the appropriate resources on projects that do pose concern for historic and archaeological resources.

This strategy can help to address the constraint of inefficient Section 106 consultation.

Examples

TxDOT worked with the FHWA Texas division, the Texas SHPO, and ACHP to develop a programmatic agreement among these parties that significantly reduces the number of projects that must receive individual consultation with SHPO. This agreement has saved time on many TxDOT projects because they no longer have to wait for formal review and comment from SHPO, and it has allowed SHPO staff to focus their time on projects that are most likely to affect Section 106 resources.

Several other states have developed similar programmatic agreements, including Vermont, Maryland, Pennsylvania, New Jersey, and Washington. FHWA has information about statewide Section 106 programmatic agreements and suggestions for states considering this approach (*33*).

A programmatic agreement for Section 106 has also been used nationwide among the U.S. Department of Agriculture Rural Utilities Service, the National Telecommunications and Information Administration, the National Conference of State Historic Preservation Officers, and the ACHP for the Broadband Technology Opportunities Program and Broadband Initiatives Program.

Effectiveness

Schedule

Delegating Section 106 review to the DOT can avoid redundant efforts with FHWA and the possibilities for delay that

can occur when multiple agencies perform similar functions. Delays can also be avoided or reduced on projects that SHPO and FHWA agree are unlikely to affect historic or archaeological resources and can thus go through an expedited review process or even avoid review outside the DOT entirely.

Cost

Developing a programmatic agreement requires close collaboration among the involved parties, and maintaining its function also necessitates continued coordination to ensure it is being implemented as intended and to update it as additional provisions or changes become needed. The time needed for this up-front collaboration and continued work requires a cost commitment from all parties. In particular, DOT and SHPO staff will need to devote more time to regular meetings to discuss the use of categorically excluding some project types from Section 106 review. This expense can be offset by cost savings from reducing the amount of formal consultation with SHPO on certain project types and avoiding the delay that can sometimes occur from this consultation.

Risks

Delegating Section 106 review to internal DOT staff can add pressure to these staff from project managers to make decisions that facilitate project delivery. DOTs will need to foster an organizational culture that supports professional decisions about historic and archaeological resources.

Other Benefits

Identifying types of projects or activities that do not need review or consultation by FHWA or SHPO can allow these agencies to focus their time and resources on the projects most likely to affect Section 106 resources. Additionally, consultation on projects that may affect Section 106 resources can be improved with a programmatic agreement that specifies consultation approaches, analytical techniques, and data sources.

Applicability

A programmatic agreement to streamline Section 106 review could work in any state. However, these agreements require close working relationships among the signatories. State DOTs will need to have demonstrated a strong commitment to historic preservation and sensitive treatment of archaeological resources to gain the trust from FHWA to delegate some of their Section 106 responsibility and from SHPO to agree that some project types do not require their individual consultation.

Programmatic agreements can also work at jurisdictional scales other than statewide, as shown by the nationwide example cited above. Local and regional transportation agencies may also see a benefit from this strategy if they routinely engage in activities that trigger Section 106 review by a SHPO or similar agency.

Strategy 17: Programmatic or Batched Permitting

- **Strategy Group:** Analysis
- **Phases:** Planning, NEPA, design (the programmatic instrument must be developed before the NEPA phase, and probably before the planning phase)
- **Decision Points:** Multiple decision points

Definition

By developing a single permit that can cover multiple, separate actions, it is possible to substantially expedite the permitting (and delivery) of that collection of projects. Two basic approaches include (*a*) a batched permit or approval, which typically covers a set of specific actions that are identified in advance of the permit; and (*b*) a programmatic permit, which typically covers a collection of future actions that may or may not be specifically identified in advance of the permit. The actions that will be covered by a programmatic permit are typically those that can meet the specific performance standards or other conditions specified in the permit.

A regional general permit for Clean Water Act Section 404 compliance is an example of a type of programmatic permit. A regional general permit can cover the permit requirements for any action that can meet the conditions specified in the permit.

An example of a batched approval is a biological opinion that covers multiple, specified actions subject to consultation under ESA Section 7. Section 7 consultation does not typically grant programmatic approvals but can allow batched approvals.

This type of permit typically specifies the terms and conditions that would be associated with specific types of impacts, places limits on the magnitude of impacts, specifies the types of actions (or the specific actions in the case of batched approvals) that can be covered, and outlines the process and documentation that will be required to ensure that any ensuing action is covered by the programmatic permit or batched approval.

Constraints Addressed

The time required to secure a given permit (e.g., Clean Water Act Section 404) can extend and delay project delivery. Often resource agencies don't have substantive input to the project development process until conceptual designs have been drafted, which can lead to redesign and extended schedules.

In addition, considerable time can be spent permitting the various individual projects that a transportation agency implements over several years. It is likely that a number of those projects and permits will cover similar issues, draw similar conclusions, and follow similar procedures. In spite of this, project teams often do not incorporate the permitting lessons learned from previous projects into subsequent project development. This occurs because there is different staffing for the various projects and because the lessons learned are rarely documented or incorporated into standard procedures. Both of these situations create opportunities to apply new strategies that can expedite project delivery.

This strategy can help to address the following constraints:

- Issues arising late cause project change;
- Conflicting resource values;
- Lengthy review and revision cycles;
- Slow decision making;
- Inability to maintain agreement;
- Difficulty agreeing on impacts and mitigation; and
- Inordinate focus on single issue.

Examples

AASHTO Center for Environmental Excellence

AASHTO's programmatic agreement toolkit includes a step-by-step interactive online web-based process for understanding programmatic agreements and ways to implement them. This toolkit includes model language and suggested implementation methods (*34*).

Colorado Shortgrass Prairie Initiative

CDOT developed an agreement to implement a set of best-management practices for maintenance and proactive advance mitigation for 36 species. The agreement and programmatic biological opinion proactively conserves and/or addresses potential mitigation needs for over 30 declining but unlisted species in the region, delivering conservation and management of over 30,000 acres for projects over a 20-year period.

CDOT's agreement to advance mitigation occurred without analysis of the condition of the habitat to be potentially affected; much of the habitat was mowed at the time of the agreement, lacking wildlife value, but CDOT agreed to mitigation as if the area had higher value (*35, 36*).

Oregon DOT's Statewide Bridges Program

Batched Biological Assessment and Biological Opinion

With over 300 bridges, this program included many different waterways and many species of threatened or endangered salmon, other fish, and wildlife. Preparing a biological assessment and biological opinion for each bridge, or even each set of bridges, would have been extremely costly and time consuming. This batched biological assessment and opinion covered multiple species for multiple bridge projects across multiple waterways around the state (*37*).

Regional General Permit for Clean Water Act Section 404

Again, with over 300 bridges, this program included many different waterways and wetlands around the state. Some of the projects could qualify for nationwide permits, but many would require individual permits. Permitting each bridge or even each set of bridges individually would have required considerable time and effort. The regional general permit developed with the U.S. Army Corps of Engineers and other agencies covered the Section 404 permitting needs for nearly every bridge replacement or repair project that needed a permit. The regional general permit was issued pursuant to the Corps' authority under the Clean Water Act. It includes conditions for certification pursuant to Section 401 of the Clean Water Act and the Coastal Zone Management Act. The program also secured a general authorization to cover state wetland and waterway permitting requirements (*38*).

One Set of Permit Standards

The Oregon bridge program developed a very efficient approach for implementing the programmatic permits and batched approvals by developing a single set of permit standards, including performance standards. These standards were common across three types of permit: the regional general permit for Clean Water Act Section 404, state wetland permitting, and the ESA Section 7 batched biological opinion. Using a single set of permit standards was identified as an early objective of permitting and was intended to reduce or even eliminate potentially conflicting or inconsistent permit conditions across multiple permits from multiple agencies on multiple projects. In addition to the schedule advantages of batched and programmatic permits, the bridge program was further expedited, and enjoyed cost savings, by ensuring consistency in permit conditions across these three types of permit, which had overlapping jurisdiction on the same resources.

Effectiveness

Schedule

Developing and securing a programmatic or batched permit and approval are very likely to take more time than securing a permit for an average individual project. The time savings are realized through the collective expediting of the individual projects that can all be approved through a single programmatic permit. These time savings can be significant.

Cost

Overall, permitting costs tend to be substantially reduced. However, this strategy requires making funding available up front to develop the programmatic permit. This is out of step with many states' funding processes, as permitting funds are typically not spent, and perhaps not even allocated, before programming each individual project. Developing programmatic permits typically occurs before NEPA work begins, although development at that stage is not necessarily required. It can begin during early planning and programming or during the NEPA process.

Risks

There is a risk of developing a programmatic permit with conditions that are too rigid or exclusive, such that no or nearly no projects can comply.

Other Benefits

Because this strategy reduces redundant efforts, makes permitting individual projects more efficient, and reduces the timeline to permit projects, it reduces permitting costs. This approach requires more up-front time from resource agency staff, but it reduces the demand on resource agency staff time as the individual projects are implemented. The approach also provides greater assurance to the transportation agency that individual projects can be permitted.

As long as transportation agencies follow through on the programmatic avoidance and mitigation commitments contained within the programmatic permits, this method can improve relationships between transportation agencies and resource agencies.

A programmatic permit can help to initiate and support the development of programmatic mitigation, which can help transportation agencies to further expedite project delivery, as well as reduce mitigation costs. It can also provide greater predictability for each individual project, that is, a more predictable permitting time frame and more predictable permit conditions.

The cost reductions associated with programmatic permitting can allow more funding for environmental enhancements that benefit the resource and can further expedite project or program delivery.

Applicability

A programmatic permit is not intended to address a standalone megaproject, although some permitting for a megaproject may be covered by programmatic permits developed to cover multiple actions. The primary reason to develop a programmatic or batched permit is to address the permitting needs of multiple projects, such as a program of improvements, so as to avoid the time and cost associated with securing an individual permit for each project or action. The up-front costs and time to complete a programmatic or batched permit or approval is a worthwhile investment for expediting the delivery of such programs. It can be done for a regional program, a statewide program, or even a collection of actions that is not necessarily part of a common program. A programmatic permit can also cover multiple states when there is adequate commonality among the regulating agencies and the regulated resources that the permit is intended to cover.

Developing a programmatic permit is generally easier when the body of actions to which it will apply is relatively known and when the impacts are reasonably foreseeable at the phase in which the programmatic permit is being developed. The impacts need not be completely foreseeable, as it is possible and not uncommon to include performance measures as conditions of the programmatic permit.

Strategy 18: Real-Time Collaborative Interagency Reviews

- **Strategy Group:** External coordination and communication
- **Phase:** Primarily NEPA, though sometimes applicable for preparing planning documents
- **Decision Points:** Multiple decision points, through chiefly ENV-8 and ENV-10

Definition

State DOTs, FHWA, and FTA have begun using collaborative, concurrent reviews, as well as real-time drafting and revising, to expedite agreement on environmental documentation. This strategy can involve an iterative drafting process in which sections of the document are sent off separately for review instead of waiting for the entire document to be completed. The review and revision process can be further streamlined if the reviews by the multiple agencies involved are done concurrently. Concurrent reviews can reduce the time spent working through a sequential review–revise process, and conflicting comments from different reviewers are more easily reconciled as these comments arrive together.

Constraints Addressed

A major element of preparing many environmental documents, such as EAs, DEISs, and FEISs, is the review and revision process with resource agencies and cooperating agencies. Frequently, these reviews are sequentially lined up after reviews from the DOT and from the NEPA lead agency. These multiple rounds of reviews can introduce substantive comments requiring major

changes to documentation style and even analysis. This can be especially time consuming if later reviewers' comments conflict with those of previous reviewers, requiring additional coordination to reconcile these differences.

This strategy can help to address the following constraints:

- Issues arising late cause project change;
- Unusually large scale of and/or complex project or program;
- Ineffective internal communication;
- Lengthy review and revision cycles;
- Slow decision making;
- Inordinate focus on single issue; and
- Inability to maintain agreement.

Examples

Lower Manhattan Transportation Improvements

The agencies involved edited the documentation in real time together. This allowed all participants to weigh in, hear other reviewers' comments, and understand how each issue was resolved, thereby avoiding a more protracted process involving revisions that would need to be sent back to reviewers. Caltrans and NDOT have reported using a similar approach.

US-95 Improvement Project

This Nevada project was centered in Las Vegas and Clark County, which for decades was one of the fastest-growing counties in the country (*21*).

Southeast Metro Denver Corridor Multimodal Transportation Project

Interagency coordination was a key factor in this Denver-based project, which included transportation expansion between the central business district and the Denver Tech Center (*39*).

District of Columbia 11th Street Bridges Project

This project used an intense workshop setting to complete full internal reviews and revisions of the preliminary EIS in just 3 days. Key agency and consultant team members committed three long days to reviewing and editing all analyses and findings in the document. This was not an interagency review, but the strategy was a highly effective approach to real-time review that could be applied to interagency reviews.

I-94 North–South Freeway Project

The project team and reviewers worked in real-time sessions to address comments and reconcile conflicting edits. In addition to the real-time sessions, the project team scheduled each document section on the reviewers' calendars 3 months in advance. This allowed for the reviewers to block out 2 weeks to review each section concurrently and then reconcile comments in real time. This process saved an estimated 3 weeks per section.

Effectiveness

Schedule

This strategy can help projects to stay on schedule by eliminating time spent responding to separate rounds of review, coordinating comments by multiple agencies, and reconciling conflicting comments.

Cost

Overall, this strategy should reduce project cost by streamlining the review and revision process, eliminating multiple sequential rounds of review, and decreasing the time spent reconciling conflicting comments. Real-time drafting or revising can require additional time, and thus cost, by resource agencies that then need to spend time with the project team as they write or revise the document. Sometimes this cost must be paid for by the action agency by funding liaison positions or paying for time from existing staff at the resource agencies. However, if resource agency reviews are more efficiently addressed and the possibility of repeated review and revision cycles is reduced, this strategy may ultimately save the resource agencies' time.

Risks

Perceived risks of allowing resource agencies access to environmental analysis and documentation concurrently with the DOT and/or NEPA lead agency is a primary reason this strategy is not standard practice. By disseminating draft sections to all agencies at once, the DOT and NEPA lead do not have a chance to review the material before it is sent to resource agencies. This requires trust by all parties that all material in the initial draft is subject to change and there are no implied commitments that early language has been vetted by the DOT or federal lead. Early and continued coordination with the resource agencies can help to alleviate some of the risk and concern of releasing documentation concurrently, but ultimately this strategy requires a history of collaboration between the agencies and trust between the individuals working on the project.

Applicability

The strategy has very broad applicability, but it is most appropriate on the most time-sensitive, high-priority, and well-funded projects. It is unlikely that agencies could dedicate the resources to follow this approach on multiple projects. The strategy is easiest to implement on reviews involving only a

few agencies, but the benefits are even greater if more agencies can simultaneously and cooperatively complete reviews.

Co-location of the project team can help to facilitate jointly drafting or reviewing and revising the environmental document.

Strategy 19: Regional Environmental Analysis Framework

- **Strategy Group:** Analysis
- **Phases:** Planning, NEPA (but the regional environmental analysis framework typically needs to be developed well before the NEPA phase)
- **Decision Points:** Multiple decision points before NEPA

Definition

A regional environmental analysis framework establishes a standardized approach for evaluating impacts to resource types and is especially useful at streamlining cumulative impact analyses and project-related mitigation agreements. This approach typically identifies common data formats, analytical techniques, issues specific to certain resource types, important past actions, and any other considerations that may help to standardize impact assessments and facilitate a uniform approach for evaluating cumulative effects. A regional environmental analysis is most useful if undertaken with multiple agencies that are likely to consider actions affecting the same resources, so that going forward, each agency abides by the framework, making cumulative effects assessments easier for all parties.

Constraints Addressed

Conclusively identifying cumulative resource effects can be difficult on individual projects. In addition, single projects can be inordinately delayed when they affect resources that are mired in broad controversy and concern outside the scope of the project. The format, data, and analytical techniques used to evaluate impacts to resources often vary widely across different agencies and sometimes even across different projects within a single agency. This requires agencies to attempt to compare and consolidate impacts that have been measured differently and relate them to the action they are considering, which can be tenuous and difficult for other agencies and stakeholders interested in the resource.

This strategy can help to address the following constraints:

- Issues arising late cause project change;
- Stakeholder controversy and opposition;
- Conflicting resource values;
- Avoiding policy decisions through continual analysis; and
- Difficulty agreeing on impacts and mitigation.

Examples

Lower Manhattan Transportation Improvements

A regional environmental analysis framework was developed across all projects so that the analysis and document contents were standardized, and cumulative effects were evaluated for each action using the same analytical techniques and data. The consistent framework expedited review times by making the documents easier to understand. It also facilitated work on resource issues across projects (*40*).

Denver Fast-Trax

This multicorridor transit expansion program developed an environmental impact assessment manual that applies to all corridors, so all environmental documents are developed, reviewed, and revised in the same way.

BART

The California Bay Area project, BART, adopted standard mitigation policies across all neighborhoods to mitigate issues arising over what areas received noise walls and other amenities.

Effectiveness

Schedule

This strategy helps projects to stay on schedule by minimizing time spent making cases and negotiating differences. The coordinated cumulative effects analysis reduces redundancy and fosters consistency across projects. The use of common technical methodologies streamlines the environmental process by reducing the learning curve required by project sponsors to complete the analysis and the time it takes for agencies to become familiar with the analysis for each project.

Cost

Developing a regional environmental analysis framework requires time and money up front, with the promise of saving both on individual projects going forward. Getting agreement up front on the framework can be difficult, and since money is typically tied to projects, it tends not to be available for coordinating across projects.

Risks

Developing a regional environmental analysis framework should generally be well accepted by resource agencies and

should ultimately reduce uncertainty for individual projects. Relying on the techniques outlined in the framework should generally be a far less risky approach than developing an approach on each project. Legal challenges should be less likely, at least those based on analytical technique, and reviews from resource agencies are also less likely to cause delay as the agencies will already understand the data and methodology.

Other Benefits

As a regional environmental analysis framework is implemented on projects, it can become progressively more useful because past actions implementing the same techniques and data provide a foundation that is easily integrated into future projects' assessments of cumulative effects on resources.

Applicability

Note that the Eco-Logical approach endorsed by eight federal agencies and SHRP 2 C01 and C06 projects reference a regional ecosystem framework for analysis that provides a common framework for identifying a region's top ecological priorities for investment (*41*).

A regional environmental analysis framework can be developed for a wide range of geographic scales and different applications. Statewide approaches make sense as resources and associated regulations and agencies tasked with protecting them often operate at this jurisdictional scale. However, larger scales make sense for many resources (e.g., ESA-listed species), as well as applications that can be tailored for MPOs. Additionally, a regional environmental analysis framework can be developed for a specific program encompassing multiple related projects anticipated to be funded and constructed separately but sharing common attributes, contiguous or overlapping boundaries, and/or affecting similar resources.

Strategy 20: Risk Management

- **Strategy Groups:** All groups
- **Phases:** All phases
- **Decision Points:** All decision points

Definition

Risk management is the practice of actively dealing with project risk, including planning for risk, assessing risk, developing risk-response strategies, and monitoring risk throughout the project life cycle. Risk management is more effective when started near the beginning of any process. For example, while rigorous scoping during the early stages of NEPA compliance can be challenging because of the lack of project details, it can provide substantial benefits in long-term schedule reduction and cost savings when the added risk analysis at this early phase helps to reduce the frequency or severity of unanticipated scope changes later in the process. Risks are defined as uncertain events that have a positive or negative effect on project objectives (scope, schedule, budget, and quality).

According to FHWA, "Risk management processes, tools, documentation, and communication are less standardized than any other dimension of transportation project management" (*42*). Only a few state DOTs, including Caltrans and the Washington State DOT (WSDOT), have established explicit risk management processes to incorporate risk management in their planning to increase the probability and impact of positive events (opportunities) and decrease the probability and impact of adverse events (threats) to project objectives. Other states are working on developing resources to identify and minimize risks. Common approaches to risk are avoidance, mitigation, and transference.

Avoidance is changing a project objective to eliminate the threat posed by an adverse risk event. For example, natural and cultural resources are avoided or unnecessary interchanges and associated impacts are occasionally dropped from plans, as on US-285 in Colorado. In planning for expansion of CA I-710 from the Ports of Los Angeles and Long Beach, Caltrans reduced the diesel emissions effects on an environmental justice community by changing the goals, purpose and need, and scope of alternatives to be considered and mandating the inclusion of rail.

Mitigation reduces the probability or impact of a risk to an acceptable threshold. For example, in its S-curve reconstruction in downtown Grand Rapids, the Michigan DOT (MDOT) opted to close off the major downtown access route. To mitigate the economic, social, and public relations risks, MDOT assigned an internal communications specialist to maintain consistent, full-time community relations, news appearances, and other outreach activities for the project. MDOT also used support from a public relations firm. With the collaborative Colorado Shortgrass Prairie Initiative, CDOT exchanged its own mitigation risk on future projects that could affect rare species for certainty by conserving lands in advance (mitigation) and then transferring the risk of managing those lands adequately to The Nature Conservancy, which will work with the state Natural Heritage Program to assess and adjust management strategies annually.

Transference shifts the negative impact of a threat, along with the ownership of the response, to a third party. Like CDOT's work with the Colorado Shortgrass Prairie Initiative, the North Carolina Ecosystem Enhancement Program, funded by North Carolina DOT (NCDOT), has transformed some of its land management risk into opportunity for partner agencies and conservation organizations that sought such environmental investments and had the organizational infrastructure and experience to manage lands in perpetuity. In a

Eugene, Oregon, ODOT project on the Beltline interchange, ODOT and FHWA used an innovative intergovernmental agreement to shift project design responsibilities to the City of Springfield to reconcile local preferences with federal standards. More often, DOTs transfer risk forward; for example, on the US-285 EA in Colorado, the issue of induced growth and potential future transit need was explicitly left to be addressed in 20 years.

Risk management can streamline project development by reducing the likelihood that risk events occur and by preparing management and adaptation response for when they do arise. Giving adequate attention to understanding, avoiding, minimizing, and mitigating risks in advance can avoid many problems, increase schedule predictability, and smooth the project development process. In recent years, several state DOTs (see the California and Florida examples below) have demonstrated notable success at cost-effectively meeting performance objectives, despite rising costs and public expectations.

Constraints Addressed

DOTs sometimes encounter unexpected and costly project problems that too frequently cause delay. Problems can stem from late discovery of environmental issues or work left unperformed. Since risk management is focused on identifying and managing risks, it can help to address any of the constraints described in this report.

Examples

Caltrans Risk Management Handbook

The Caltrans handbook outlines a process project managers can use to manage risk and meet project delivery goals (*43*). At Caltrans, the project management team completes a risk management plan when the project is initiated, and the plan is monitored and updated throughout the life of the project. Caltrans requires project managers to maintain scope, cost, and schedule estimates in a permanent project history file, which is updated annually; at project milestones; or when significant changes occur between milestones. This documentation must accompany any program change requests sent to the headquarters division of project management. Caltrans' risk management process includes the following six steps.

Risk Management Planning

Risk management planning considers potential risks and identifies and develops a strategy to manage the risks.

Risk Identification

Identification is the documentation of risks that might affect a project using input from internal and external stakeholders. This iterative process evolves as the project progresses.

Qualitative Risk Analysis

After the risks are identified, the team assesses the probability and impact of the risks. The analysis allows for the categorization of the risks into high, moderate, and low risk based on their potential effects on schedule, cost, scope, or quality.

Quantitative Risk Analysis

This analysis uses statistical techniques to estimate the probability that a project will meet its cost and time objectives based on estimates of the likelihood and effect of identified risks.

Risk Response Planning

Response planning develops options to reduce or avoid risks and assigns responsibility for implementing the risk management strategy and monitoring the risk over time.

Risk Monitoring and Control

It is important to keep track of identified risks, residual risks, and new risks over the life of the project. It also is necessary to monitor the execution of planned strategies and evaluate their effectiveness.

Florida DOT's Risk Analysis

This method is similar to the Caltrans method, but FDOT also developed a risk-based graded approach (a process to identify the overall risk value of a project) and a project risk register (a formal risk analysis that uses input from internal and external stakeholders for complex and risk-prone FDOT projects) (*44*). The first step in the FDOT method is the development of a risk management plan to identify and document potential project risks. The risk-based graded approach analysis quantifies project risks early in project development and helps to determine planning and control requirements; however, the assessment is not used as a substitute for formal risk identification, qualification, quantification, and response planning. FDOT's risk-based graded approach analysis helps to determine how to assign project management resources, define the project scope, evaluate risk elements (risk versus cost), and get agreement from all project team members.

FDOT identified 15 critical risk elements (other risks can be added, or some may be eliminated) to assess the overall level of risk, per element, per project priority (scope, schedule, cost, and quality). The project team assigns each element a value between 1 and 5. The risks are then prioritized according to the scores, and assigned a value of 1, 3, or 5. The total risk score is calculated by multiplying the risk scores by the priority scores for each of the 15 elements. The risk element scores are totaled to determine the overall project risk score.

Effectiveness

Schedule

Risk management strategies are designed to identify and avoid or reduce schedule disruptions and delay.

Cost

The task of actively identifying, characterizing, tracking, and managing risk adds another line item to project budgets. However, avoided schedule disruptions translate into substantial cost savings for DOTs, particularly in times of higher inflation and with rising costs for resource inputs.

Risks

By definition, this approach is designed to reduce the occurrence and effect of potential risks. It does not cause any substantive new risks.

Other Benefits

Risk management contributes to predictability, which benefits relationships with other agencies, local jurisdictions, and other stakeholders. Conflicts and risks avoided can build trust among a project team and with stakeholders, providing deposits in good-will bank accounts that can help projects to surmount future challenges.

Applicability

Risk management can be employed with a variety of approaches with varying degrees of effort and intensity, making this a broadly applicable strategy. In theory, this strategy can help to proactively address nearly all potential constraints that might be encountered on a project. This is of course limited by both the ability of the approach and the individuals involved to accurately predict a risk and by their ability to then implement appropriate measures to reduce the likelihood of the risk's occurrence and/or the severity of its effect. Some degree of risk management should (and generally does) occur on most projects, so consideration of this strategy should focus on the particular techniques described and referenced above.

Strategy 21: Strategic Oversight and Readiness Assessment

- **Strategy Group:** Decision making
- **Phases:** Planning, NEPA
- **Decision Points:** Multiple decision points

Definition

At the outset of a major multiagency endeavor (e.g., during NEPA scoping or even earlier), internal commitments and interagency agreements offer a mechanism for identifying all parties' functional and financial responsibilities, staffing and other resource requirements, and a timeline for these provisions. Developing these interagency agreements entails assessing the capacity of each agency to provide resources and identifying if any additional resources are needed.

These agreements also provide a method for installing a common system of protocols and establishing a common oversight function for the interagency project or program that provides traditional project or program management functions, such as a single accounting and procurement system, tracking scope, schedule, and budget.

Environmental analysis, documentation, and review can be streamlined via these interagency agreements or through ancillary agreements or memoranda of understanding between the agencies. Regardless of the specific documentation technique, these agreements can define common environmental analysis techniques, coordinate certain elements (e.g., cumulative effects), define the roles and responsibilities of each agency for developing or overseeing specific elements of the environmental analysis, and include commitments to specific reviewing time frames and methods.

Constraints Addressed

This strategy addresses the difficulty of gathering, rallying, and managing resources to initiate a major project or program of projects. Beginning major projects that require involvement and commitment from multiple agencies can present significant challenges as these agencies typically must provide staff with a range of specific expertise to quickly address the many managerial, procedural, and technical issues that face complex transportation projects. Compounding this challenge is the need for multiple agencies, departments, and consulting firms to commit these resources simultaneously so that the project may begin efficiently and is not held back by lagging elements.

This strategy can help to address the following constraints:

- Unusually large scale of and/or complex project or program;
- Ineffective internal communication;
- Slow decision making;
- Inability to maintain agreement; and
- Lack of dedicated staff.

Example

Lower Manhattan Recovery

The Lower Manhattan recovery effort employed this strategy to address the significant and simultaneous management

challenges that arose while coordinating several major capital improvement projects that involved many different federal, state, and local agencies. This approach addressed concerns regarding the readiness (e.g., adequate staffing, availability, and expertise) and ability of these agencies to move quickly to resolve issues as they arose.

Effectiveness

Schedule

This strategy can help projects to stay on schedule by ensuring agencies have adequate staffing, availability, and expertise to handle the workload and to avoid delays that can occur from multiple management techniques and protocols.

Cost

This approach adds cost for assessment at the outset, but can save costs by avoiding delay.

Risks

The approach is designed to reduce risk from inadequate or unavailable staff resources and by mobilizing expertise. A risk exists that all anticipated staffing may not be fully needed, but this risk can be less severe than the risk of delay if resources are not available when needed.

Other Benefits

This approach can improve long-term interagency relationships and prevent existing relationships from deteriorating because of frustration over wait times and unanticipated demands.

Applicability

This strategy is applicable for major transportation endeavors that involve multiple lead agencies that introduce complex managerial and technical challenges. Smaller and more routine projects are unlikely to benefit from a full implementation of this strategy, but they may still benefit from interagency agreements that streamline environmental reviews, which inevitably involve multiple agencies.

Strategy 22: Team Co-location

- **Strategy Groups:** Internal communication and organization, decision making
- **Phases:** All phases, though less applicable to planning
- **Decision Points:** Multiple decision points

Definition

Many large, successfully expedited projects have used co-located project teams to help expedite internal communication, review, and decision making. This approach can also increase the commitment and focus of team members on the project. When the project's sponsor agency, NEPA lead, and key technical staff are just down the hall from each other, internal communication and coordination can happen faster. With a co-located team, meetings are easier to arrange, travel time became a nonfactor, and spontaneous working sessions became frequent. Internal reviews of documents can be performed hot off the press, as the project team is able to immediately share draft work products with reviewing agencies. This rapid review of drafts can produce substantial time savings over the typical cycle of preparing a complete draft, distributing it internally for comments, revising, and then sending the revised draft out to resource agencies for their input.

Constraints Addressed

It is common for progress to be repeatedly delayed when decision making is slow, when decisions must be revisited and changed, or when there are internal communication impediments. These problems obviously apply to the major milestones, but they can also affect the many more frequent and smaller decisions required on a project. The internal structure of project teams has an important effect on how decisions are made, the time it takes to reach the necessary consensus to move forward, and the likelihood of needing to readdress issues. This is especially true for large, complex projects that span multiple jurisdictions and have more than one lead agency. For these projects, team members are often separated in different offices or work under different entities. Such an arrangement impedes easy and organic conversation that can help diverse project teams to build a common understanding, work through divisive topics, and make day-to-day decisions, thus accelerating progress toward milestone decisions.

This strategy can help to address the following constraints:

- Unusually large scale of and/or complex project or program;
- Ineffective internal communication;
- Lengthy review and revision cycles;
- Slow decision making; and
- Lack of dedicated staff.

Examples

Colorado DOT's I-25 Expansion

One of the major contributors to an accelerated NEPA process for this project through central Denver and the Denver Tech Center was a cooperative and collaborative effort between

CDOT and the Regional Transportation District, as well as FTA and FHWA, supported by the physical co-location of the project team. CDOT and Regional Transportation District staff assigned to the project were co-located in an office building with NEPA consultant Carter-Burgess and its subconsultants. With all project team members under one roof (no environmental agencies co-located with the project team), meetings were easier to arrange and spontaneous working sessions became the norm, thus fostering a sense of teamwork among the various agencies and firms working on the project. Internal reviews of EIS sections were performed quickly. With little time lost to these internal reviews, the project team was able to immediately share draft work products with reviewing agencies. Co-location allowed a substantial time savings over the typical NEPA EIS cycle of preparing a complete draft, distributing it internally for comments, revising, and sending the revised draft to resource agencies for their input.

Washington State Department of Transportation

The WSDOT practice of locating multiple agencies in a common office with one primary goal has been successfully implemented in several instances. In 2003, three Washington State agencies and one federal agency co-located personnel in a common office, which has since become a continuing practice. This multiagency permitting team, ultimately joined by King County, identifies potential permitting risks, develops cooperative processes and solutions, and provides a unified package of environmental information to the project manager at an earlier point in the process than previously occurred. WSDOT found that this arrangement helped to reduce environmental impacts and keep the projects on schedule. The team is composed of engineers, biologists, and project managers from the Washington State Department of Ecology, the Washington State Department of Fish and Wildlife, WSDOT, the U.S. Army Corps of Engineers, and King County. Team members are internally accountable to each other, as well as reporting regularly to a steering committee comprising individual supervisors from each agency. Performance measures and business results are presented to the directors of all five agencies every quarter. The team is funded and led by WSDOT and currently oversees 45 projects in WSDOT's Northwest Region. On average permits are authorized approximately 45 days from the time of a complete application, and to date, no multiagency permitting team permits have resulted in a project delay. The team goal is to permit projects at least 60 to 90 days before the project contract advertisement (so far, their average is 82 days). The team also aims to process permits quickly and accurately, work out conflicts, and reduce the chance of delays. The team has created the following programmatic improvements:

- Defined WSDOT and regulatory agency expectations for a complete application;
- Implemented early project coordination meetings and response letters to identify project risks and opportunities;
- Created and implemented the first Washington State interagency design–build permitting process; and
- Worked on testing the new online joint aquatic resource permit application.

The team identified further improvement opportunities within each agency, including wetland mitigation site selection, design, and long-term site management and monitoring; stormwater design guidance; guidance on documentation of alternatives analysis; and a policy on improvements in fish passage and habitat design. WSDOT contributed its co-location experience in *Consultant Co-location: Things to Think About and/or Guide Your Decision Making* (*45*).

Trans-Alaska Pipeline Co-location Model

The trans-Alaska pipeline office co-located multiple agencies, providing a model that the Alaska Department of Transportation and Public Facilities is now trying to implement with resource agencies. In Alaska's model, all agencies would have a dedicated representative for review of state transportation projects. The DOT is seeking federal funding to implement this approach. A similar model is in place at the Missouri DOT, where the environmental division is co-located centrally with the state Department of Natural Resources. Co-location occurs outside of project development, too. For example, operations and intelligent transportation systems centers in Tacoma, Vancouver, Spokane, and Yakima, Washington, are co-located with other operating agencies.

Colorado DOT

CDOT employed this strategy on projects for a 19-mile urban corridor (230,000 vehicles per day) where I-25 and I-225, the two most heavily used roadways in Colorado, provide the primary access between central Denver and the Tech Center to the southeast, as well as to I-70, the region's major east–west freeway. The NEPA process for the Southeast Corridor project took 25 months from notice of intent (NOI) to record of decision (ROD) (*4*).

Effectiveness

Schedule

This strategy can help projects to maintain schedule by reducing internal communication bottlenecks that can delay decision making and progress on day-to-day tasks that require coordination among otherwise disparate parties.

Cost

This strategy often requires additional office space to house project staff together in a single location, requiring funding for rent, additional infrastructure, and other ancillary costs of maintaining a new or expanded office.

Risks

Leasing commitments and acquisition of new infrastructure and office equipment can pose a risk if the project is unexpectedly put on hold or shut down. Also, there can be monetary consequences if the IRS determines that consultants are treated too much like employees. In at least one case, the courts determined that independent consultants working long-term, on location, were actually more like employees of the organization, and were entitled to all benefits of that organization (Vizcaino v. Microsoft Corp. 1999). However, many factors play into determining whether a person is a consultant or an employee. The IRS uses the 20-factor test, and meeting one or even a few of these factors does not mean that the line is crossed; however, the more factors that are met, the higher the risk (*46*).

Other Benefits

Having agencies and consultants under the same roof allows for a level of interaction not otherwise possible in projects with large, diverse teams. Other benefits from this approach can include an enhanced sense of teamwork among the various agencies and firms working on the project, closer working relationships, and shared expertise. Co-location provides a natural forum for identifying, debating, and resolving conflicts that arise during project review, design, and permitting. The cooperative attitude of team members, combined with encouragement from each agency, contributes to a can-do, problem-solving environment.

Applicability

WSDOT and the Washington chapter of the American Council of Engineering Companies have compiled a list of recommended items to discuss and decide on when considering co-location between the DOT and consulting firms. These items include space and equipment planning, overhead rate, schedules and expectations, logistics and administration, policies, training and compliance with agency standards (e.g., ethics, safety), equity, scope creep, working on other work at the site, project logo and branding, team building, and partnering. Issues have been identified and suggestions are available in each of these areas (*45*).

Strategy 23: Tiered NEPA Process

- **Strategy Group:** Analysis
- **Phases:** COR, ENV
- **Decision Points:** All decision points in the COR and ENV phases

Definition

A tiered NEPA process allows agencies to perform planning studies under NEPA via a Tier 1 EA or EIS. This first-tier study typically looks at a large problem or series of related problems programmatically, with the intent that project-level studies will follow in the second tier, either as a direct continuation of the first-tier study or as multiple separate projects reliant on the analyses and findings from the first tier. With a few important distinctions, the Tier 1 EA or EIS can function similarly to typical corridor plans or conceptual planning studies; second-tier evaluations are generally analogous to project-level NEPA studies. By initiating NEPA at the planning phase, the state or local transportation agency will ensure more formal engagement by the federal lead agency than would otherwise occur during a planning study. Similarly, beginning NEPA during planning can help a project to garner involvement from state and federal resource agencies that are often not involved until NEPA is initiated. Perhaps most importantly, the tiered NEPA process produces a preliminary ROD (a formally documented interim decision) at the conclusion of the first tier. Gaining greater involvement from the federal lead agency and resource agencies in the planning phase, and concluding it with a ROD, can ensure this work is more easily and effectively leveraged during subsequent second-tier studies.

Constraints Addressed

Many agencies struggle to leverage work done during planning studies in their NEPA evaluations. Transportation agencies often use planning studies to define the scope and breadth of a problem area, initiate outreach with stakeholder groups, and identify possible solutions. However, for a variety of reasons the work done during these planning studies is often revisited during subsequent NEPA evaluations. Revisiting work done during the planning phase often occurs because transportation agencies fear that decisions and progress made prior to an NOI are vulnerable to a legal challenge. In other cases, the planning process didn't involve the same parties generally brought in during the NEPA phase, particularly resource agencies. Revisiting earlier work when transitioning from the planning phase into NEPA can increase the time and cost of a project, as well as introduce a potentially confusing

process for the public and stakeholder groups following the project's progress.

This strategy can help to address the following constraints:

- Issues arising late cause project change;
- Unusually large scale of and/or complex project or program; and
- Inability to maintain agreement.

Examples

Missouri DOT and Bureau of Land Management

The Missouri DOT used a tiered NEPA process to address a large series of problems along the I-70 corridor. The Bureau of Land Management is using a national programmatic EIS for wind energy projects throughout the western United States.

Effectiveness

Schedule

This strategy can reduce project delivery duration by helping project-level NEPA evaluations (second-tier studies) more effectively leverage work done during the planning phase (first tier). In particular, doing planning work under NEPA can decisively narrow the range of alternatives that need to be explored in the second-tier studies. A ROD concluding the planning phase offers a greater level of certainty for the subsequent studies that this decision will not have to be revisited.

Cost

The cost of this strategy is primarily related to how it affects a project's schedule. Cost savings can be accrued to the extent that this approach is able to reduce redundancies between the planning and NEPA phases and thus reduce staff time and project duration. However, transportation agencies should expect some additional coordination effort during the planning phase due to greater involvement with the federal lead agency and resource agencies and the preparation of two EISs.

Risks

A tiered NEPA process is complex. Stakeholders, and even the project team, can be confused. It is critical that the project team develop a clear communication tool for the intended process and the goals and scope of work for each phase. Otherwise, there is a high risk of confusing participants and producing less meaningful involvement. In particular, resource agencies are often not experienced at providing input early in the planning phase, so it is important to explain the process and intent of early coordination meetings. Similarly, the public may get confused about the multiple public comment periods that NEPA requires, which can lead to disinterest or frustration when the project team seeks repeated input as the project or program progresses.

Other Benefits

The primary benefits are to schedule, cost, and agency and public relationships. These are also the primary risks of this strategy.

Applicability

This strategy is most effective at providing a structure and decision-making framework for transportation agencies addressing projects with a large geographic extent that require multiple levels of decision and/or large projects that are likely to split into multiple separate projects. The tiered NEPA process can introduce unique risks, and many projects are better served by a traditional single-tier NEPA process. If there is a clear approach for addressing a problem, even though there may be variations on the approach that need to be studied, a tiered NEPA process might add what would otherwise be unnecessary steps and time by requiring more analysis, documentation, and public comment periods. Similarly, a problem likely to be addressed as a single project may receive less benefit from a tiered process than a problem that is likely to be split into multiple separate projects that could rely on a preceding ROD.

Strategy 24: Up-Front Environmental Commitments

- **Strategy Groups:** Decision making, external coordination and communication
- **Phases:** Planning, NEPA
- **Decision Points:** Multiple decision points

Definition

Making environmental commitments during planning or early project development can expedite what would otherwise be long and protracted analysis and negotiation. To be most effective, the commitments should exceed the minimum mitigation that would be required for regulatory compliance.

A DOT's willingness to invest in environmental enhancement commitments in the early phases of a project or during planning can streamline the environmental process by changing conversations to a positive track and saving participants from having to prove certain impacts and the necessity of mitigation. Transportation projects thereby avoid delays from protracted negotiations, reanalysis, and continual data collection.

Early commitments to improve resources can allow transportation agencies to avoid the protracted debate and negotiations that can delay environmental documentation, permitting, and project design.

While the specific nature of these commitments will vary widely depending on project type, the surrounding environment, and agency and stakeholder interests, several elements are common to this strategy that prevent impediments during project development and NEPA documentation. First, these environmental commitments should be made early, either during the planning process for selecting candidate project design and environmental evaluation, or during the early phases of NEPA or design. By making these commitments early, the DOT can avoid ongoing and protracted requests for further analysis of impacts or having to continually change the design of and commitments to mitigation measures. However, because the DOT must understand the issues, desires, and concerns of the project's stakeholder groups and applicable regulatory agencies, early outreach and coordination is vital. The magnitude of commitments or level of performance standards must be sufficient to address stakeholder and agency concerns and avoid the impression that the DOT is shirking requirements for the impact avoidance and minimization that would otherwise result from prolonged environmental analysis and debate. Ultimately, early environmental commitments that are greater than the project impacts can help to bypass sticking points with resource agencies and stakeholder groups.

Constraints Addressed

The process of conclusively identifying environmental impacts and subsequently negotiating and designing mitigation and attaining approvals can be very slow and cause project delays.

Transportation projects are frequently delayed because of disagreement over how environmental impacts are assessed, the relative significance of impacts, and/or the appropriate type and level of mitigation measures. These debates can bog down progress toward key decision points as parties spend time lobbying for their desires, withholding approval, requesting further analysis, and otherwise extending negotiations. The true causes or issues that create this type of delay can be difficult to identify during these debates, but can often be traced to attempts by an agency or individuals to protect and improve specific resources they care about, even if such resources may not be seriously affected by the project, or to minimize mitigation costs.

This strategy can help to address the following constraints:

- Stakeholder controversy and opposition;
- Conflicting resource values;
- Avoiding policy decisions through continual analysis;
- Difficulty agreeing on impacts and mitigation; and
- Inordinate focus on single issue.

Examples

Multiple states now engage in proactive mitigation planning, with encouragement from SAFETEA-LU and the federal interagency Eco-Logical approach to developing infrastructure projects (*41*). Examples of this approach are the Colorado Shortgrass Prairie Initiative, the Maryland Intercounty Connector, and the Lower Manhattan transportation improvements project.

Maryland Intercounty Connector

Maryland state highways' largest project incorporated environmental stewardship in every aspect of the project in a proactive way that did not require extensive demonstration of impact. This project committed $370 million (approximately 15% of the total project cost) to environmental enhancements and avoidance (*47, 48*).

Colorado Shortgrass Prairie Initiative

CDOT developed an agreement to implement a set of best-management practices for maintenance and proactive advance mitigation for 36 species. The agreement and programmatic biological opinion proactively conserves and/or addresses potential mitigation needs for over 30 declining but unlisted species in the region and delivers conservation and management of over 30,000 acres for projects over a 20-year period.

CDOT's agreement to advance mitigation occurred without analysis of the condition of the habitat to be potentially affected; much of the habitat was mowed at the time of the agreement, lacking wildlife value, but CDOT agreed to mitigation as if the area had higher value (*35, 36*).

Lower Manhattan Transportation Improvements

In these improvements, a system of environmental performance commitments was incorporated into the project irrespective of the extent of impact so that the parties could receive assurance their resources and issues of concern would be addressed regardless of how the projects were developed. These commitments eliminated the need for a more lengthy process of developing analyses and data to support each party's cause (*49*).

District of Columbia's 11th Street Bridges Project

A system of environmental performance commitments can also be used for purposes other than natural resources. The District of Columbia's 11th Street bridges project used this approach to address Section 4(f) resource impacts. By working closely with the National Park Service (NPS) to understand

how the unavoidable impacts to an NPS property could not only be mitigated, but how the resource's value could be improved, the project leaders were able to use a Section 4(f) net benefit programmatic agreement, thus reducing the time required to complete the final Section 4(f) evaluation.

Kangley–Echo Lake Transmission Line

This project developed an extensive list of innovative mitigation commitments and documented these in negotiated agreements and the FEIS. These commitments addressed all of the concerns of stakeholders and assured participants in the process that the watershed affected by the project would be left in better condition after construction than it was before the project. The commitments also included specific performance measures for the project, including turbidity levels in the watershed that provided drinking water to the City of Seattle. The project purchased a liability insurance policy to be paid to the City of Seattle if the project caused an increase in turbidity and resulted in a need for treating the water.

Effectiveness

Schedule

Advanced mitigation or environmental or resource enhancement that is sufficiently attractive to achieve buy-in from multiple regulatory agencies and other stakeholders can streamline project development, increase predictability, and smooth project management. This strategy can reduce time spent negotiating and arguing the assessment and quantification of impacts and design of appropriate mitigation measures.

Cost

The added mitigation and enhancement will likely have a higher capital cost than mitigation that would meet minimum regulatory requirements. However, the approach can save considerable costs by reducing project delays that arise due to protracted negotiations over mitigation commitments. The net result of additional capital costs versus cost savings associated with reduced delay will vary depending on the characteristics of the project or program. Aggregate savings are generally going to be maximized on projects and programs most likely to suffer from delay due to extended analysis and negotiation of impacts and mitigation.

Risks

This approach is designed to reduce risk. By agreeing to fund environmental commitments early in project development or during planning, action agencies reduce the risk of delay and unexpected demands from resource agencies and stakeholder groups and can thereby implement their projects more efficiently. However, making up-front commitments can introduce the risk of over commitment if the project design is able to reduce impacts considerably further than originally anticipated. This risk can be reduced if the environmental commitment is tied to an impact performance measure. There is also the risk of noncompliance with regulations that require avoidance and minimization before mitigation. It is important to ensure that the commitment to environmental enhancement and mitigation does not supplant requirements to attempt to avoid and minimize impacts.

Other Benefits

Up-front environmental commitments made before specifying analysis of impacts or finalizing project design can provide beneficial publicity and press coverage from groups that might otherwise be critical of the project.

Applicability

This strategy has broad applicability. Most state DOTs engage in projects and programmatic actions that encounter delay due to protracted negotiations around the uncertainty and analysis of impacts and development of mitigation measures. Most projects and programs with the potential for this delay could benefit from up-front environmental commitments made before finalizing design (and the impact conclusions).

However, some states face restrictions on spending that is not directly tied to completion of legislated environmental requirements, and thus may not have the flexibility to commit funding for environmental mitigation before it is directly tied to project impacts.

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CHAPTER 4

Case Studies

This chapter documents the case studies gathered from the research and interviews described in Chapter 1. Each case study is relatively brief, focusing on the application of the specific expediting strategy it illustrates, including the project attributes that influenced the success of the strategy, the likely constraints it addressed or proactively avoided, and the lessons learned by the project team. These lessons learned, which generally come directly from interviews with staff from the project or resource agencies, can offer valuable insight into why the strategy worked, techniques or factors that could have improved it, or specific scenarios for which staff believe the strategy is most beneficial. Each case study description also specifies whether the example is a specific project or a program of separate actions, a distinction that can be relevant to the transferability of the expediting strategies.

District of Columbia 11th Street Bridges Project

Summary

The 11th Street bridges project will be the largest project ever constructed by the District of Columbia, and it is the first river bridge replacement constructed by the District in more than 40 years. In spite of this, the District DOT (DDOT) and FHWA were able to complete the National Environmental Policy Act (NEPA) process in just 34 months (from NOI to ROD), considerably faster than FHWA's 68-month median for completing EISs. The project's NEPA process also met FHWA's national performance objective to complete the EIS within 36 months.

The 11th Street bridges project faced a number of challenges to timely delivery. DDOT successfully addressed these challenges through early planning and several key strategies that helped to expedite project delivery, including responsive public and agency engagement, early commitment of construction funding, up-front environmental commitments, planning and environmental linkages, expedited internal review and decision making, and context-sensitive design (CSD).

Although the existing bridge over the Anacostia River is an Interstate facility, it does not provide direct connections between the Anacostia Freeway and the Southeast Freeway. This lack of connection results in substantial congestion on local streets caused by cut-through traffic. The new project will eliminate this cut-through traffic; separate local traffic crossing the river from Interstate traffic crossing the river; and provide improved transit, bike, and pedestrian access across the river. The separation of local traffic from Interstate traffic will also improve operations and safety on the Interstate bridge.

Project Overview

The 11th Street bridges project is part of a broader revitalization effort known as the Anacostia Waterfront Initiative, which is led by the District of Columbia Office of Planning. Partners in the initiative include FHWA and DDOT. In 2004, DDOT commissioned a Middle Anacostia River Crossings (MAC) study to explore transportation planning and redevelopment options in the area that would support the Anacostia Waterfront Initiative. The MAC study recommended over 30 short-, mid, and long-term projects to enhance transportation infrastructure, safety, accessibility, mobility, and connectivity and to support broader revitalization of the waterfront, including completion of the 11th Street bridges project's missing highway connections. In 2005, FHWA issued an NOI to formally get the project under way.

In addition to building the necessary ramp infrastructure, the project will replace deficient bridge components, expand bicycle and pedestrian facilities, accommodate future streetcars, and make aesthetic improvements to the bridge and freeway interchanges. The current traffic pattern of the

11th Street bridges requires drivers to leave the freeways and navigate local roads to access other freeway connections. This results in highly congested neighborhood streets, degraded air quality, increased noise, and other factors affecting transportation access, mobility, and quality of life. By building missing freeway ramps and adding a new bridge for local traffic only, the project will separate regional and local traffic and significantly improve vehicular, bicycle, and pedestrian traffic and safety in the Anacostia neighborhood.

The existing 11th Street bridges are a pair of one-way bridges that cross the Anacostia River in southeastern Washington, D.C. They are projected to carry almost 180,000 vehicles daily by 2030. The bridges were built in the mid 1960s to provide a vital link between the Anacostia Freeway (I-295 and DC-295) and the Southeast/Southwest Freeway (I-695). However, the full connections envisioned in the original plan were never built. One of the main reasons for this was opposition from the community on the west side of the river. This lack of direct connecting ramps resulted in considerable cut-through traffic on local streets, particularly on the east side of the river. Drivers heading south on the Anacostia Freeway cannot access the bridges, and drivers heading east across the bridges cannot access the Anacostia Freeway heading north. For decades, the only alternative has been to use neighborhood streets to compensate for these missing highway connections. The 11th Street bridges project will complete these connections, as well as add a new bridge and other improvements. Project cost is estimated at $360 million, with a federal contribution of $17 million and is projected to be completed in 2013 (see Table 4.1).

The project is intended to

- Improve mobility by providing separate freeway and local traffic connections to both directions of DC-295, the Southeast/Southwest Freeway, and local streets on both sides of the Anacostia River;
- Provide a shared path for pedestrians and bicycles, as well as rails to allow future streetcar connections;
- Replace the existing functionally deficient and structurally obsolete bridges;
- Provide an additional alternate evacuation route from the nation's capital; and
- Include new trail connections, improved drainage, and other environmental investments.

Project Constraints

The 11th Street bridges project faced multiple challenges that could have derailed progress and extended the schedule, including significant environmental impacts and issues, a large number of permitting agencies, past public opposition, diverse public interests, and a project of unprecedented size and scope for the sponsor agencies.

Unusually Large Scale of and/or Complex Project or Program

The unique nature of this project within the district also posed a challenge for the sponsor agencies, the District of Columbia and the FHWA division office. These agencies had very little experience with EISs and large projects, and this was the first major transportation project for both the

Table 4.1. 11th Street Bridges Project Timeline

1960s	Existing 11th Street bridges constructed.
2003	Proposed new 11th Street project first appears in the District's transportation improvement program as a planning study.
2004	MAC study explores transportation planning and redevelopment options in the area that would support the Anacostia Waterfront Initiative. MAC study recommends transportation projects, including the completion of the 11th Street bridges' missing highway connections.
September 2005	NOI to prepare an EIS published in the Federal Register.
June 2006	DEIS published.
November 2007	FEIS published (signed September 2007).
July 2008	ROD issued.
Fall 2008	Design–build contractor hired.
July 2009	NEPA and Section 4(f) reevaluation (covering project design changes after the ROD).
December 2009	Construction began.
Mid-2013	Projected construction completion.

District and for the division office in many years. This lack of experience and unfamiliarity with the type and scale of this project posed a challenge to expediting delivery.

The project had significant environmental concerns that added to the scale of the project and required coordination and approvals from a large number of regulatory agencies:

- Section 404 permitting and NEPA coordination from the U.S. Army Corps of Engineers were required for fill and removal in the Anacostia River.
- Clean Water Act Section 402 compliance and coordination were required by EPA.
- Clean Water Act Section 401 compliance was required by the District Department of the Environment.
- Navigation clearance and Rivers and Harbors Act Section 10 compliance were required by the U.S. Coast Guard.
- National Marine Fisheries Service consultation under Endangered Species Act (ESA) Section 7 was required.
- National Park Service (NPS) approvals were required because the river, as well as the shorelines at each end of the bridges, is owned by NPS. Impacts to other Section 4(f) resources included a boat house, a national park (Anacostia Park on the eastern shore, also eligible for listing on the National Register of Historic Places), and a local park on the western shore that also included Section 6(f) protection.
- Coordination with the State Historic Preservation Officer (SHPO) was critical, because the east end of the bridge lands in the Anacostia Historic District, and the west end lands in the Capitol Hill Historic District.
- Hope 6 public housing was present near the east end of the bridge.
- The project was in a nonattainment (now maintenance) area for ozone.
- Potential impacts to low-income and minority communities (as defined by the Executive Order on Environmental Justice) in Anacostia neighborhoods on the east side of the river had to be considered.
- Two federal entities—the National Capitol Planning Commission (NCPC) and the Commission on Fine Arts—had unique authority in the District. The NCPC has approval authority over all federal lands (including NPS land) in the DC metro area. The Commission on Fine Arts has an advisory role to ensure that art and architecture components (including view sheds) in the District are not compromised.

Insufficient Public Engagement or Support

Neighborhoods on both sides of the river had substantial concerns about the proposal and how they would be affected by the alternatives. Alternatives likely to be preferred by the community on one side of the river were likely to be rejected by the community on the other side. There was substantial diversity in neighborhood characteristics. The Capitol Hill neighborhood, on the west side, is affluent and has a low number of minority households. The neighborhoods in Anacostia, on the east side, are predominantly African-American with a much higher number of low-income households.

Communities on both sides of the river were well aware of the potential impacts and issues and asked challenging technical and policy questions.

Under current conditions, the lack of direct connections between the bridge and the freeway on the west side of the river causes traffic to use local streets on the east side. These streets suffer from the congestion of cut-through traffic. Part of the solution would be to add connections on the west side of the river. Initially, communities on the west side were opposed to this.

Expediting Strategies

DDOT adopted an aggressive schedule and committed the necessary resources to advance the project and meet the goal of improving the quality and timeliness of the transportation delivery process. To develop the project's DEIS, DDOT partnered with the public and more than 30 federal and nonfederal participating agencies to gain early acceptance by stakeholders. The team identified critical project issues, which improved the scoping phase and addressed stakeholders' concerns early. As a result, the solutions presented in the FEIS were representative of stakeholder needs and were environmentally sound. DDOT's early planning and collaborative and proactive approach to developing the 11th Street bridges DEIS resulted in a streamlined project. Expediting strategies included

- Planning and environmental linkages;
- Early commitment of construction funding;
- Facilitation to align expectations up front;
- Coordinated and responsive agency involvement;
- Up-front environmental commitments;
- Highly responsive public engagement;
- Expedited internal review and decision making; and
- Context-sensitive design and solutions.

Planning and Environmental Linkages

The District conducted extensive up-front planning work before initiating the NEPA process. The District's Office of Planning developed a framework plan identifying the transportation actions needed to support the revitalization efforts of the broader Anacostia Waterfront Initiative. Access problems were identified as key to revitalization. DDOT, which was charged with improving access, developed a master transportation plan to identify key problems, how to address them, and what needed to be done. An Anacostia crossing study was developed specifically to identify river crossing

problems and potential solutions. The primary problem identified was congestion caused by the diversion of traffic from the Interstate to local streets as a result of the missing freeway-to-freeway connections. This planning also identified a number of alternatives and proposed the strategies of dividing local traffic from Interstate traffic and establishing better freeway-to-freeway connections. These strategies were the foundation for the 11th Street bridges project. As part of the early planning effort, the department also developed initial cost estimates for various projects.

The planning analysis identified the impacts that the existing and projected problems have and would continue to have on access, safety, air quality, noise, emergency access, businesses, and aspects of quality of life. Peak traffic congestion on affected local streets can last for 4 hours in the morning peak and 4 hours in the afternoon peak. The department presented these analyses and findings to the mayor and city council, along with cost estimates for the various solutions.

The detailed early planning, public involvement, and issues analysis also helped to streamline the NEPA process that followed.

Early Commitment of Construction Funding

DDOT staff did not necessarily identify the early commitment of construction funding as a key to expediting project delivery. Even so, the city council, in approving construction funds early in the NEPA process, also mandated that construction be completed by a certain date. The early funding and construction completion deadline provided motivation and authority within the agency to ensure that internal agency actions were expedited and did not cause project delay. DDOT's method of securing early funding also provides an example for other agencies. The intensive planning and analysis conducted on the broader needs for waterfront revitalization, and in particular, the role of improved access and transportation in achieving the revitalization goals, helped the department to secure funding commitments for construction much earlier than usual in the project development process. The city council approved funding for the 11th Street bridges project based on the planning studies and analyses conducted before the NEPA process was initiated. The analyses, findings, cost estimates, and public input secured in the early planning helped to facilitate this early decision by the Council. The Council also mandated that construction be complete within 6 years of the funding approval, which required that the NEPA process be completed in less than 36 months. Early funding allowed DDOT to implement the NEPA process with a commitment to construction funding already in hand. Up-front funding commitments can promote expedited delivery, primarily because they represent an agency's commitment to the project and demonstrate that the project is a high priority.

Facilitation to Align Expectations Up Front and Coordinated and Responsive Agency Involvement

The 11th Street bridges project team set an ambitious timeline to complete the EIS. To facilitate expedited EIS review and help project managers and stakeholders to better meet streamlining and stewardship objectives, DDOT secured FHWA's assistance through the NEPA Teambuilding Initiative, which was administered by the FHWA Office of Project Development and Environmental Review. According to the FHWA streamlining and stewardship newsletter:

> The goal of the NEPA Teambuilding Initiative is to assist state DOTs and FHWA Divisions in improving the quality and timeliness of the transportation-development process through teambuilding. The Initiative will also help to ensure that environmental stewardship and improved decision making are built into transportation-project development and review.
>
> The NEPA Teambuilding Initiative encourages public involvement throughout the EIS process, establishes project time frames that are agreeable to all stakeholders, and uses transparent methods to document project impacts and progress. (*1*)

Earlier stages of the project development process for selected projects, such as team building and conflict resolution; scoping with interagency teams; and subject matter documentation and review, are integral in building a solid team and a project that is cost-effective with fewer delays. For these reasons, assistance is usually highly prioritized during these early stages (*1*).

DDOT found that the NEPA Teambuilding Initiative work was especially helpful in developing a more effective and efficient interagency coordination process. The FHWA Office of Project Development and Environmental Review contacted other federal agencies to set up communication and coordination lines and to expedite input and responses from those agencies. The involvement of FHWA headquarters and its Resource Center, with their extensive experience with EISs and large projects, also helped the DC division of FHWA to be more effective. FHWA headquarters also helped to expedite FHWA's legal sufficiency review. Reviews occurred at both the DEIS and FEIS phases. The reviews were preceded by face-to-face briefings at the Resource Center. Legal sufficiency review was completed in 15 days, about half the usual duration.

Interagency meetings were an important aspect of expediting agency coordination. The department already had this process established for other efforts and adopted it for the 11th Street project. This process included traveling to individual agency offices for face-to-face coordination (at least three briefings for each agency, including EPA, the U.S. Army Corps of Engineers, NCPC, and others). More frequent

meetings occurred with agencies such as NPS and SHPO. DDOT found that it was most effective to solicit initial input and concerns from the agencies and then propose an approach based on that initial input. For example, this method was critical to securing the Section 4(f) net benefit programmatic agreement for impacts to Anacostia Park (see the section below on up-front environmental commitments).

Agency coordination was also expedited through early agreements developed through the NEPA team-building work, which allowed project leaders to accomplish at least partial concurrent reviews of key project materials.

Up-Front Environmental Commitments

The project's use of Section 4(f) resources was unavoidable. Affected resources included a boat house, the river itself (owned by NPS), a local park, historic resources, and the NPS-owned Anacostia Park. Generally, DDOT found that it was most effective to solicit initial input and concerns from the various resource agencies and then propose an approach based on that initial input. This was critical to securing the Section 4(f) net benefit programmatic agreement for impacts to Anacostia Park. DDOT took the time to understand the minimization and mitigation measures that NPS would require to agree to the net benefit finding and committed to these minimization and mitigation measures early in the environmental process. This up-front commitment played a critical role in the Section 4(f) net benefit finding and in expediting the completion of the final Section 4(f) evaluation.

Highly Responsive Public Engagement

Instead of holding traditional public meetings, DDOT held workshop-like meetings with the public from the beginning of the NEPA process so that community members could have meaningful dialogue and instant feedback. These meetings followed from the public involvement that occurred during the earlier planning phase. The workshop approach increased the awareness and knowledge of the public and helped the project team to better understand specific community concerns and hopes for the project. For the initial meetings, the team brought in maps and aerial photos with no proposed designs. Although the team had already developed concepts, they indicated their willingness to consider all community members' concerns in developing the project. They sought to elicit community input on what was important to the community and what ideas they had for addressing issues. The team held 32 public and community meetings during an approximately 6-month period of preparing the DEIS. DDOT also developed a website and newsletters that were designed to present information to both the general public and technical experts in engaging, stimulating, and accessible ways.

Separate meetings were initially held with communities on different sides of the river because their issues were different. Later the community meetings were combined, which allowed the different communities to better understand the variety of concerns in various neighborhoods and among various stakeholders. The project team formed a citizen advisory committee representing the different neighborhoods and groups, and they ran issues and information by the committee before going public in order to gather suggestions on how best to convey information and solicit input.

DDOT believes this approach required more up-front costs for public involvement but resulted in a project with greater public benefit and greater public support. This support was likely responsible for expediting delivery and for reducing the long-term costs.

Communities on the west side were initially opposed to the project, but the intensive involvement helped the project to develop a preferred alternative that addressed many of their concerns and was ultimately supported by most. There were few opponents and many supporters by the end of the NEPA process. The project was legally challenged, but the challenge was settled through negotiations.

Expedited Internal Review and Decision Making

The commitments of the DDOT staff and decision makers to expedited review and decision making were critical factors in expediting overall project delivery. This included a commitment on the part of the project manager to be accessible by telephone any time between 6 a.m. and 11 p.m., which allowed issues to be identified and elevated, and often resolved, very quickly. It also included the commitment from agency decision makers to make decisions quickly and efficiently. Lengthy and cumbersome internal reviews and decision processes typically result in stalling the project team and progress being put on hold. Expediting the internal processes can have substantial expediting benefits.

The project manager and other project leadership also agreed to conduct quick internal reviews. During the development of the DEIS, the department's project manager and other staff, as well as FHWA staff, occasionally met biweekly with the consultant team and met monthly with outside agencies. When the consultant draft DEIS was completed and delivered to DDOT, the department's project manager and key staff, along with consultant leads, met in a workshop setting off site (to avoid distractions) for 3 days, from 8 a.m. to 11 p.m. each day. They reviewed the entire document and resolved issues regarding all of the technical analysis and findings. At the end of the 3 days, the review and revisions were complete, allowing the revised document to be forwarded with recommendations to the DDOT directors. In the

more traditional approach, it would not be unusual for this process to take weeks to complete.

DDOT leadership committed to making quick policy and other decisions to keep the project advancing. At the beginning of the project, the project team met with DDOT senior leadership (the chief engineer, department director, and associate director) to clarify policy directions up front and establish a process for efficiently gaining needed direction as the project progressed. For example, the senior leadership made it clear in the first meeting that they did not want the project to displace any residences, and they were willing to make other compromises to meet this goal. This provided an important policy parameter that guided project development. They also made it clear that cost was an important consideration, and they wanted a thorough analysis to determine whether any of the existing structures or substructures could be reused to reduce costs. Maintenance of traffic operations during construction and avoiding adverse impacts to environmental justice communities were other policy priorities that, because they were made clear early in the process, helped to provide clear guidance to the project team. This clarity of policy helped to expedite project development.

Project staff updated agency leadership routinely at key points in the process. When it was time to select a preferred alternative, they held a half-day workshop with the decision makers and included senior staff from the consulting team to provide their perspectives and breadth of experience on this important decision.

The project was approved by DDOT leadership, and then by the city council and mayor.

Context-Sensitive Design and Solutions

Employing CSD principles helped the project to provide greater public benefit and secure public support. Factors relevant to CSD included the adjacent parks, neighborhoods, environmental justice communities, the river, the U.S. Navy yard, historic districts, a desire for local connectivity, and a desire for greater access by transit, bicycling, and walking. DDOT developed alternatives that could minimize impacts to and/or benefit each of these resources. They also set up the public involvement process so that stakeholders could clearly express their preferences for the individual components of any given alternative, rather than having to choose between alternatives. This method allowed the project team to more precisely understand stakeholder concerns and preferences and allowed the team to combine various components from different alternatives in order to create an alternative that was most responsive to the different contextual elements. Context sensitivity also included separating local traffic from Interstate traffic and creating a new direct connection between the local arterials on either side of the river.

Under current conditions, the only connection between the two sides of the river is via I-295. This hinders local movement between the communities on either side and results in a dangerous series of weaves and merges and in conflicts between local traffic and through traffic. The new project will maintain the Interstate lanes across the river, but it will also build a new local bridge that separates local traffic from Interstate traffic. The local bridge will connect two minor arterials (at 25 mph speeds) on either side of the river, providing direct connections for cars, buses, a future streetcar, bicycles, and pedestrians. It will include 15-foot-wide pedestrian paths.

Another aspect of CSD was the removal of a portion of the Interstate facility that was built in the 1960s but was not being used because it did not connect to any other facility. This unused section was elevated (40 to 50 feet), about three-quarters of a mile long, and six lanes wide. DDOT had this unused section de-designated from the Interstate system and then removed it along with unused ramps. These changes removed the visual barrier and allowed new ramps to be built at lower elevations.

Some of the applications of CSD principles to the project added construction costs, but DDOT does not believe that they raised the overall cost of the project. The greater context sensitivity of the project reduced impact and right-of-way costs, reduced public opposition, increased public support, improved the community asset value, and helped to expedite delivery. DDOT also believes that the application of CSD did not compromise traffic operations. While the project did not add capacity to the Interstate, it clearly will improve Interstate operations and safety. It will separate local traffic from Interstate traffic, add a local connector bridge, and add other factors that will improve operations of the Interstate, as well as improve operations and access for local traffic and other transportation modes.

Lessons Learned

DDOT has incorporated many of the successful practices from the 11th Street bridges project into an environmental process and policy manual that provides guidance for project implementation. As of July 2010, DDOT is developing further updates to the manual. They have also established a goal of completing all EAs within a 1-year time frame and all EISs within 18 to 24 months.

In addition to the lessons described above, DDOT emphasizes the importance of being clear with the public and other stakeholders up front regarding their roles in decision making. While they emphasize the importance of highly responsive public engagement and using CSD principles to design projects, they also believe it is critical that the public understand that ultimately DDOT directors and elected officials are responsible for making decisions about the projects. As part

of this emphasis, they avoid having the public engage in voting exercises on the alternatives, although they do have the public provide input or even vote on their preferences regarding issues, functions, or project components. This approach solicits more precise input about public preferences and reduces the risk of dividing communities through attachment to specific alternatives.

The department believes that agency reviews are an aspect of project development that still has substantial remaining potential for expediting. This includes permitting agency reviews as well as FHWA reviews. The review process often takes as long as or longer than the time required to collect data, conduct analyses, and prepare documentation. Reviews that take multiple weeks or even months are not necessary and could be greatly reduced with focused effort and prioritization (*1–3*).

Flagler Memorial Bridge Project

Summary

The Flagler Memorial Bridge project development and environment (PD&E) study was a complex project to evaluate the need to replace a 70-year-old bascule bridge over the Intracoastal Waterway in West Palm Beach, Florida. It was also one of the first projects to use the full vision of FDOT's efficient transportation decision-making (ETDM) process. On interviewee said of the ETDM programming screening, "This project is accepted as a Type II Categorical Exclusion. However, depending on the outcome of the Section 106 Consultation, the document may have to be elevated to an Environmental Impact Statement (EIS)." Ultimately, creative mitigation measures and other actions allowed NEPA to be completed through the documented categorical exclusions process, thus avoiding an EIS, which would have increased time and cost considerably. This resulted in an estimated savings of $7.6 million in consultant fees and inflation costs that would have resulted from delay in construction of the bridge.

Two expediting strategies proved particularly useful for this project to maintain its schedule and avoid elevating the NEPA classification to an EIS:

- Early consideration of environmental factors and the establishment of planning-level environmental screening criteria produced a more informed and effective process of developing and evaluating potential alternatives.
- FDOT-funded liaison positions provided the necessary staff at resource agencies to achieve the robust coordination that helped this project to proactively identify and address potential environmental issues.

Project Overview

The Flagler Memorial Bridge was constructed in 1938 and is part of Florida SR-A1A. Bridge inspections conducted by FDOT showed that the bridge was structurally deficient for the following reasons:

- The bridge substructure was graded 4 on a scale of 10;
- The remaining bridge structure was graded 32.4 on a scale of 100; and
- Previous inspections had noted exposed steel at several bridge locations.

Additionally, the bridge did not meet current FDOT and U.S. Coast Guard standards, and it was judged to be functionally obsolete for the following reasons:

- Lane widths are 10 feet. The current standard is 12 feet.
- Handrails do not conform to current design standards for impact loading.
- Vertical clearance over the Intracoastal Waterway is 17 feet. The current standard is 21 feet.
- Horizontal clearance at the navigable channel is 80 feet, considerably less than the current standard of 125 feet.

Flagler Memorial Bridge was included in the ETDM programming screen process before beginning the PD&E study. As the PD&E study progressed, it was determined that the Flagler Memorial Bridge was eligible for listing on the National Register of Historic Places. The memorandum of understanding between FHWA and the U.S. Coast Guard concerning historic bridge replacement created the real possibility that FHWA would change the class of action to an EIS. The project could have been delayed several years had this occurred.

FDOT explored what could be done to maintain the Type II categorical exclusions determination, which was vital to meet the project schedule. The FDOT team met with the consultant team, including their subconsultants, and established an aggressively detailed schedule to pinpoint the activities and timeline needed. Much of this effort required seeking concurrence from SHPO regarding the effects to the resources, particularly that replacement of the bridge would not result in a depletion of the resource and that preservation in place was not necessary. It became apparent that the project team needed to meet with representatives of SHPO and FHWA to clarify certain aspects required from both agencies to obtain their concurrence.

Over the next 4 months, the project team met regularly, on some occasions by teleconference, to discuss the status of activities, to resolve issues, and to provide documentation to SHPO that the bridge could be replaced. On January 15, 2008, a letter was sent to David Gibbs at FHWA from Fred Gaske of

SHPO concurring "that the replacement of the (Flagler Memorial) Bridge is not a substantial depletion of the resource type, primarily based on nonhistoric changes to the bridge and the existence of more intact examples of similar bridge types. Consequently, we agree that this bridge is not important for preservation."

Following the January 15th SHPO letter, the project team still faced complex requirements to replace a historic bridge, including use of a cultural resource committee of local historic preservation experts to define acceptable commitments prior to replacement. A binding memorandum of agreement (MOA) between FDOT, SHPO, and FHWA was signed on April 3, 2008, to ensure unique measures would be taken to memorialize the National Register of Historic Places–eligible bridge. Creative mitigation measures were agreed to in the MOA, such as the creation of an aesthetics committee with local representation for new bridge design elements, historic marker plaques, an educational DVD on the bridge to be used in schools, and a marketing plan for others to acquire and preserve the existing bridge. The successful coordination between SHPO and FHWA allowed for the completion of the PD&E study. On April 9, 2008, FHWA granted location and design concept acceptance, which is required before PD&E projects can move into the design phase. In numerous meetings, the project team worked with an aesthetics committee and stakeholders from West Palm Beach and the Town of Palm Beach to help design characteristics of the new bridge based on concepts of the old bridge. These retained design elements were required to ensure that the cultural resource commitments from the Section 106 MOA were maintained in the final design. The timeline for the project is shown in Table 4.2.

Project Constraints

This project encountered a variety of challenges, but late-arriving issues causing project change and inefficient Section 106 consultation with SHPO were the two constraints that directly challenged the project's streamlining strategies.

Table 4.2. Flagler Memorial Bridge Project Timeline

January 2006	PD&E study begins.
September 26, 2006	Cultural resource committee meetings begin.
Fall 2007	Meetings with FHWA and SHPO to discuss cultural resource and class of action.
October 25, 2007	Public hearing held with public input and support of preferred alternative.
April 3, 2008	MOA signed by FDOT, FHWA, and SHPO.
April 9, 2008	Location and design concept acceptance.

Given the desire to avoid a costly and lengthy EIS process, this project was especially vulnerable to the potential for late issues creating project delay. Even moderate potential environmental impacts, if identified late in the NEPA process, could create delay as the project would be forced to evaluate their potential significance and/or develop design modifications to avoid the impacts. Therefore, an early and thorough evaluation of resources and potential impacts to them was crucial to avoiding delay later on.

The project's aggressive schedule hinged on the ability to maintain its status as a Type II categorical exclusion under NEPA, which in turn relied largely on concurrence from SHPO that the project would not potentially cause adverse effects to historic resources. As such, effective Section 106 consultation with SHPO was vital to the project.

Expediting Strategies

Planning-Level Environmental Screening Criteria

FDOT's ETDM process helps the agency to incorporate environmental factors into early planning, that is, during identification of potential projects and the first stages of their development. In the case of the Flagler Memorial Bridge, this process provided valuable information and a foundation from which the project was able to progress on its rapid schedule.

Florida's ETDM process and its environmental screening have been recognized by several national agencies as an exemplary process, and AASHTO and FHWA have recognized ETDM with their top environmental excellence awards. The ETDM process begins with two opportunities for early project review and screening by all participating agencies: the planning screen and the programming screen. During these screening events, participating review agencies work together to review and provide information to FDOT regarding the potential environmental effects that a proposed transportation project may have on surrounding resources. The agency comments received during the planning screen help FDOT and metropolitan planning organizations (MPOs) to determine the feasibility of including the proposed projects in their long-range transportation plans. The programming screen occurs when projects are being considered for funding in the FDOT work program.

The planning screen occurs in conjunction with the development of cost-feasible plans by MPOs or FDOT. Project information is reviewed by agencies with planning, regulatory, or resource management jurisdiction over environmental resources that may be affected by the project. The project is also reviewed by the federally recognized Native American tribal governments that have agreed to participate in the ETDM process. These participants provide comments to project planners

about the potential effects that a project might have on resources protected or managed by their agency. This initial screening of planned projects allows participants to review project purpose and need statements and to comment on the potential effects of projects on environmental and community resources very early in the planning process. Potential effects of proposed projects are evaluated and documented in the environmental screening tool (EST). In urban areas, MPOs provide input about the effects of a project on the community or neighborhoods near the project.

At this early stage of planning, the information provided by agencies and the public helps to identify project configurations that would avoid or minimize adverse effects on Florida's natural and human environments. In the case of known unavoidable effects, agencies provide commentary on suggested alternatives or mitigation measures. This information is used by project planners to alter project cost estimates. In some cases, the project priority might change based on cost feasibility due to adverse effects, and some projects might not advance due to adverse effects. Key recommendations and conclusions regarding potential project effects are provided in the planning summary report, which helps planners to develop priorities in long-range transportation plans and is available electronically to ETDM participants and the public.

The programming screen occurs before projects are funded in the FDOT 5-year work program. Input about the potential effects to environmental and community resources is the basis for agency scoping to facilitate compliance with federal and state environmental laws. If potential dispute issues are identified, FDOT may initiate a dispute-resolution process before the project is programmed into the FDOT 5-year work program. Potential disputes may also be identified through the public involvement process and require resolution before the project is advanced into the design phase of the work program. Lead agencies decide on a class of action determination for each priority project, which is summarized along with potential project effects, preliminary project concepts, reasonable project alternatives, and scoping recommendations in the programming summary report. In addition, agencies explore how lower classes of action may be possible with project modifications.

DOT-Funded Resource Agency Liaisons

The establishment of an environmental technical advisory team (ETAT) comprising DOT-funded liaison positions in several resource agencies facilitated the interagency coordination that was crucial for meeting the Flagler Memorial Bridge project's need for close and productive consultation with SHPO to determine potential Section 106 effects.

ETATs are formed in each FDOT district. Each ETAT includes DOT-funded staff positions in a variety of agencies that FDOT typically coordinates and consults with during project development. Each ETAT consists of planning, regulatory, and resource agencies, as well as participating federally recognized Native American tribal governments. Each agency and tribal government appoints an ETAT representative or representatives who have authority and responsibility to coordinate internally and to represent their agencies' positions with respect to the planning and development of transportation projects. The role of the ETAT representatives changes from advisory during the planning and programming phases to coordination during the PD&E phase and environmental permitting.

Through regular interagency and tribal government interaction, ETAT allows for mutual problem solving to occur throughout the life of a project and helps to ensure transportation decisions fully consider potential effects on natural, cultural, and community resources.

Lessons Learned

EST is a useful tool that is the product of both the strategies described above. FDOT and the agencies it works with through the district ETATs developed the EST to assist in the early identification of environmental impacts during project planning. EST provides agencies with information and analysis that helps to facilitate these early screening efforts. EST is an Internet-accessible interactive database and mapping application that integrates resource and project data from multiple sources into one standard format and provides quick and standardized analyses of the effects of a proposed project on natural, cultural, and community resources. It provides utilities to input and update information about transportation projects and community characteristics, perform standardized analyses, report comments by the agency representatives, and provide read-only information to the public.

The value of EST is heavily reliant on maintaining a wide variety of data sets. Fortunately, data are provided by each agency and tribe participating in an ETAT, as they have committed to providing data pertinent to their agency and area of interest to the EST.

Gateway Boulevard Corridor Project

Summary

Making critical design changes to improve the context sensitivity of the final segment of Gateway Boulevard—a new corridor in southern downtown Nashville—helped this project to proceed rapidly through a supplemental EIS process.

Project Overview and Timeline

The Metropolitan Government of Nashville and Davidson County (Metro), in cooperation with the Tennessee DOT (TDOT) and FHWA, proposed to construct the western terminus for Gateway Boulevard in the southern portion of downtown Nashville. This terminus would extend Gateway Boulevard 0.31 mile to the west to end at a roundabout interchange.

The Gateway Boulevard corridor, a new east–west route through southern downtown Nashville, was evaluated in the 1990s, with a ROD issued in 1998. Several sections of this corridor have been subsequently constructed, leaving only the western terminus section to be completed. Since the issuance of the 1998 ROD, the surrounding neighborhood, known as SoBro, has become a focus of extensive public and private investment in new urban development and redevelopment. Several residential and office towers have been constructed along or in the path of the selected alternative. Local land use and transportation plans were adopted showing Gateway Boulevard ending at 8th Avenue, rather than extending as far west as 13th Avenue as envisioned in the design in the 1998 ROD. In light of recent redevelopment in the project area and these local plans, Metro determined that a supplemental NEPA evaluation was needed to identify the best design for the western terminus of Gateway Boulevard.

An NOI was issued in November 2007, after which the project team began an extensive public outreach program to solicit interests and concerns about the design of the Gateway corridor's western terminus. The DEIS, published in July 2008, evaluated two design options for the terminus, both of which truncated the corridor at 8th Avenue instead of 13th Avenue as originally envisioned. One design option ended Gateway Boulevard in a traditional four-leg signalized intersection, similar to the 1998 design. In response to stakeholder input, the project team included a second option with a roundabout intersection design at 8th Avenue.

Following publication of the DEIS and receipt of public comments, Metro, TDOT, and FHWA selected the roundabout design option as the preferred alternative. The FEIS was published in December 2009, just 5 months after the DEIS. The ROD was issued in February 2010.

Project Constraints

Issues Arising Late Cause Project Change

When Metro, TDOT, and FHWA approached the final segment of the Gateway corridor, they already had a design and an environmental analysis from the 1998 ROD. The project team was aware early on that this design might need to be truncated at 8th Avenue instead of continuing to 13th Avenue, but they assumed that the same basic design up to 8th Avenue—a traditional four-leg signalized interchange—would be the most viable approach for finishing the corridor.

Stakeholder Controversy and Opposition

The team learned during scoping that local stakeholders preferred a significantly different design with a roundabout interchange at the western terminus. The roundabout posed several challenges. First, it had not been designed or modeled to the same level that the traditional interchange had, so it would require additional time and effort by the project team to determine if appropriate roadway design and traffic flow characteristics could be achieved. Second, this interchange configuration would be more expensive as a result of the more complex design and additional property acquisition needed to accommodate it.

Support for the roundabout design posed a challenge to the project's fast-paced schedule, thus exacerbating the previously mentioned constraint. The project team had originally hoped to advance rapidly through a supplemental EIS by relying heavily on the designs and environmental evaluations of the 1999 ROD. However, pushing forward with the traditional design would likely encounter strong resistance from local business groups and other stakeholders championing the roundabout design.

Expediting Strategies

Context-Sensitive Design and Solutions and Highly Responsive Public Engagement

In response to strong public support for the roundabout design, the project team chose to refocus their efforts on designing and evaluating this interchange configuration to determine if it could provide adequate traffic performance and how impacts and cost would differ from the original design. Throughout the design and evaluation process, the team met with stakeholder groups to get a strong understanding of what local business and residents wanted from this design and to explain modifications to the interchange that were needed to meet roadway design and performance standards.

Ultimately, design refinements were able to provide acceptable performance and safety while affording the community with a design that matched the local vision. The project chose the roundabout interchange as the preferred alternative to advance into the FEIS and ROD. Given the project characteristics—construction of a new roadway through a highly developed portion of the central business district—the project was able to advance quickly after adopting the roundabout design as the preferred alternative. Just 7 months passed between the DEIS that considered

the traditional interchange design and the ROD adopting the roundabout design. Had the project attempted to advance the traditional design, it would likely have been delayed by stakeholder opposition.

Lessons Learned

Adapting a project's design to match the changing preferences of a community is rarely a simple or easy solution. Public sentiment can be divided by seemingly irreconcilable preferences or can demand something well outside the original scope or purpose and need for the project. In such cases, it can be unclear to project proponents whether these are indicators that a project needs to be seriously reconsidered or re-envisioned, or whether they should push the project forward along its original path. However, whether and how to respond to changing public sentiment is always an important decision that carries potentially significant ramifications for the project's schedule and ultimate success.

The Gateway Boulevard corridor project illustrates how adapting to stakeholder preferences that have changed substantially since the project was first envisioned (or in this case, since the ROD was signed nearly 10 years earlier) can help to expedite selection of a preferred alternative and advancement through NEPA. Of course, this is not always easy, and this project benefited from a few important factors. First, the changes requested by stakeholders did not result in a radical departure in the function of the project. While a roundabout may be significantly different from a roadway design perspective, in this case the corridor would still progress along a similar path and end at an intersection of the same streets. Second, the project was not facing significantly divided or fractious demands, but rather a majority of stakeholders expressing a similar desire to redesign the terminus intersection.

However, perhaps the most important factor for the Gateway Boulevard project's success was the sponsoring agencies' willingness to consider significant changes to the project design and their openness to selecting this design when it became clear that it could function and had the support of the community. Rather than pushing forward with the design from the 1998 ROD that offered more traditional roadway design and traffic patterns and that would incur fewer impacts and cost less, the project team figured out how to accommodate the substantial stakeholder concerns and achieve transportation operational functions and benefits.

I-94 North–South Project

Summary

The southeast Wisconsin freeway network was constructed in the 1950s and 1960s. From 1991 through 2003, the system was evaluated for reconstruction and increases in capacity. The I-94 corridor from Milwaukee to the Illinois state line is the second major reconstruction project in this network, and the first to add capacity to the system. The highway provides important freight and through traffic routes, as well as local commuter service in the urbanized portions. The approximately 38-mile corridor project is being expanded from six to eight lanes, with some four-lane facilities expanding as well. A series of older interchanges that are prone to crashes caused by outdated design have also been redesigned.

The I-94 North–South project (94NS) quickly moved from an NOI in December 2005 to a ROD 27 months later. This quick project delivery can be attributed to

- Building off of prior planning efforts;
- Commitments by leadership;
- Project team communication and management;
- Integrated multiagency and consultant work teams;
- Advanced planning for DEIS and FEIS completion and review; and
- Innovative public involvement efforts.

Project Overview

I-94 is the northernmost east–west Interstate highway in the United States, connecting the Great Lakes region with Montana. The highway is an important connection between Milwaukee, Wisconsin, and Chicago, Illinois, and serves as a commuter route in the Milwaukee region. The portion of the Interstate included in the 94NS runs from southern Milwaukee to the Illinois state line. Regional growth has led to increased traffic and decreasing levels of service. Design standards for the original system are also a challenge.

94NS is a reconstruction project that includes redesigning and reconstructing 21 interchanges and increasing capacity on the main-line I-94 from the Illinois state line to Milwaukee. Constructed in the 1950s and 1960s, much of the freeway network requires reconstruction. Planning for this effort started in the 1990s. At that time, the network no longer met safety standards, which had changed since construction. Older interchange designs included left entrance and exit ramps, unsafe curves, and decreased levels of service in the urban areas. Vertical clearances along the project were also substandard, with some clearances 1 to 2 feet below current standards. Pavement conditions along the entire route had deteriorated to a point at which reconstruction was the only option left to enable the system to meet acceptable standards. Safety was also a concern, as crashes involving trucks made up a third of all crashes on the main line, well over the statewide average of 6%.

The project differs between the urban portion around the city of Milwaukee and the more rural areas of Kenosha, Racine, and Lake Counties to the south. The portion of the

project through Milwaukee includes numerous interchanges and crossing roadways. The majority of traffic volume in the urbanized areas results from morning and evening commutes. Forecasted traffic growth for the Milwaukee area ranges from 10% to 22% over 25 years, with the level of service over the area dropping to E and F. In the rural portions, traffic growth had been 18% to 19% over the 10 years before the NEPA process began. Growth was expected to continue similar to these historic trends, except in Racine County, where growth was forecasted to be 38% from 2004 to 2035. The rural portions of the project have steady levels of through traffic with peak volumes during weekends. In addition to the traffic and highway design concerns, the corridor included several substandard environmental features, including culverts that provided inadequate aquatic passage and stormwater runoff that was not properly managed.

94NS represented the largest project to date for the Wisconsin DOT (WisDOT) when the project was started, and was the first capacity project for WisDOT since the 1960s. The planning and NEPA activities were able to take advantage of previous planning efforts to assist in quickly moving the project from planning through the NEPA process. In conjunction with a regional analysis of land use and development demand, planning studies had identified a need for the project in 1991. This early planning study identified 13 interchanges for reconstruction and resulted in an EA and a finding of no significant impact (FONSI) in 1996. The 1996 EA was reevaluated as a part of the EIS, and the analysis for all but one of the interchanges in the 1996 EA was still appropriate and usable for the project. This previous EA allowed the project team to focus their analysis on the main line in this portion of the study area.

In 2003, the Southeastern Wisconsin Regional Planning Commission (SWRPC) identified the 94NS study area in a regional freeway reconstruction plan. This plan was followed by a regional land use plan and regional transportation plan. In December 2005, the NOI was published for the project, and work on the EIS began in January 2006.

The project immediately faced public controversy. Before the project team could develop a public engagement process, a series of grassroots organizations formed and started a campaign to oppose the project. This opposition was focused on fears of expanding right-of-way and loss of homes in neighborhoods. Opposition also developed within the urban portions of the project, which included about 2 to 3 miles of the total corridor. Opposing groups, which included elected officials and national advocacy organizations, objected to the project because of concerns over air quality impacts in communities with a high percentage of minority populations. In addition, a small group of businesses objected to one interchange and the change in access that the new design would require. Despite these concerns, the project was able to maintain schedule by directly addressing concerns with an extensive outreach effort, additional air-quality modeling, and early commitments to not expand the right-of-way. The opponents hired an outside firm to scrutinize these results. Following this third-party review, no further protests were made, and the project continued. At the time this report was written the project was under construction and proceeding on schedule (see Table 4.3).

Table 4.3. I-94 North–South Project Timeline

1991	SWRPC planning study for the freeway corridor identifies needs for future growth with a focus on the interchanges in Kenosha and Racine Counties.
1994–1996	Study of the interchanges and an EA of reconstruction of the interchanges in Kenosha and Racine Counties.
1996	FONSI if the interchanges were to be reconstructed, but with no capacity additions.
2000–2004	WisDOT reconstructs one interchange (the Market Interchange) in study area as separate project.
2003	SWRPC identifies a need for reconstruction of 100% of system and new capacity additions.
December 2005	NOI published.
November 2007	DEIS published.
March 2008	FEIS published.
May 2008	ROD issued.

Project Constraints

94NS proactively addressed a series of constraints that could have delayed the project. These constraints centered on project management and agency leadership challenges that can arise for large projects. Additionally, the project team reacted quickly to address stakeholder opposition as the environmental process began.

Ineffective Internal Communication

The project required clear communication from the State Secretary of Transportation, through headquarters, and down to the regional project office. The project implemented a series of systems to keep all levels of leadership up to date on project progress, challenges, and issues.

Lengthy Review and Revision Cycles

The project identified the drafting, review, and comment process for the EIS as a potential problem. Reviews were necessary

within WisDOT and with FHWA. The team implemented an early strategy to draft and review the EIS.

Unusually Large Scale of and/or Complex Project or Program

94NS was unusually large, as it was the first capacity project for WisDOT in over 40 years and the largest project for the agency. The project team identified a series of strategies to keep the project on schedule.

Stakeholder Controversy and Opposition

A series of zealous grassroots efforts began and made contact with residents in the affected areas, both urban and suburban, before the 94NS team could begin their outreach programs; as a result, misconceptions about the project had a chance to circulate well before project leaders were able to respond. The local opposition group distributed materials to oppose the project and set the tone for public meetings as the WisDOT process started.

Expediting Strategies

Team Co-location

The consultant team co-located with WisDOT staff at the regional office. The team sat side by side, allowing for ongoing review and resolution of issues as they came up. The WisDOT environmental lead was physically next to the consultant team lead, and the WisDOT project management team was just down the hall in the same location.

Strategic Oversight and Readiness Assessment

At the beginning of 94NS, WisDOT and FHWA established a joint project management team. The State Secretary of Transportation placed a liaison in the project team to provide a direct connection between the project and the Secretary's office. From 2000 through 2004, WisDOT reconstructed one interchange, the Market Interchange, as a separate project along the corridor. This project was a test case for a new project management approach that included the use of the liaison and the review process outlined in the strategies below.

Real-Time Collaborative Interagency Reviews

The team took a proactive approach to developing and reviewing the EIS. Agreements were made for concurrent WisDOT and FHWA reviews by report section. The project team committed to delivering sections of the environmental document on a specific schedule. This allowed WisDOT and FHWA reviewers to block out their schedules approximately 3 months in advance of receiving the sections. This was estimated to save 3 weeks of review time per section of EIS. The State Secretary's office made the project a clear priority for the WisDOT headquarters environmental team, allowing for timely reviews at WisDOT as the document was moved from the regional project to headquarters.

Comments and reviews were reconciled in day-long work sessions between FHWA and WisDOT, allowing the teams to collaboratively respond to comments and edit the FEIS.

Planning and Environmental Linkages

The 94NS team reevaluated the 1996 FONSI to determine its suitability for streamlining the review for the entire project. The evaluation examined whether the previous EA's alternatives, impacts, and existing data were still accurate. The review also assessed if any changes had occurred in local resources since the 1990s analysis. Design refinements in the 2007 EIS were evaluated to see if additional analysis was needed. The final review determined that the earlier EA was able to cover all but one of the interchanges, allowing the team to focus on the main-line capacity improvements.

Highly Responsive Public Engagement

As the first public meetings began, it was clear the public had critical misconceptions about how the designs would affect their neighborhoods. Misconceptions were best addressed once designs were ready to be shared. Once lines were on the ground, the team was able to effectively alleviate concerns. But this required an effective communication strategy to share how the designs addressed these concerns. WisDOT hosted block parties around the urban project area, closing off sections of neighborhood roads and including exhibits, project staff, and details on the project. The parties were held midweek around 6:00 p.m. to ensure that most people would be home and available to attend. Additionally, project team members canvassed door-to-door in urban areas, leaving information with residents. In the end, the project committed to no net growth of right-of-way.

Performance Standards

As a result of the public outreach effort, the team committed to no net increase in right-of-way area. This allowed neighborhoods to have a measureable outcome for performance and addressed their concerns over losing homes to the project. Ultimately, only eight residential structures required relocation.

Change-Control Practices

Biweekly WisDOT team meetings with the State Secretary's staff provided clear communication of project costs and changes and opportunities to discuss why changes were occurring. This strategy was another component of project management that was replicated from previous management efforts within WisDOT.

Lessons Learned

WisDOT was committed to identifying lessons learned internally from other management efforts and carrying these over to 94NS. Notably, the Market Interchange project served as a pilot project management effort that provided tools for 94NS and all subsequent large projects.

The environmental team's experience was also a contributing factor. The consultant project manager had completed over 12 transportation EIS projects at the time 94NS began. He also had access to a senior review process throughout the company.

In addition, the project was able to take advantage of the merged Section 404–NEPA process (*4–6*).

Kangley–Echo Lake Transmission Line Project

Summary

The Bonneville Power Administration (BPA) identified the need to upgrade an existing transmission line outside the Seattle, Washington, area. BPA issued its NOI the same year that the City of Seattle, the primary landowner on the route, completed a multispecies habitat conservation plan (HCP) under the ESA. The city-owned portion of the project area is the Cedar River Watershed, a protected surface drinking water source for almost half of Seattle. The project immediately encountered organized resistance and a landowner with a strong negotiation position. Using highly responsive public engagement and extensive up-front environmental commitments, BPA was able to secure agreements to build the line. Innovative and extensive mitigation commitments left the Cedar River Watershed in a better condition than it had been before BPA completed the line.

Project Overview

BPA is the regional power marketing agency for the Pacific Northwest. As a self-supported federal agency within the Department of Energy, BPA must balance the requirements of developing and maintaining its resources by funding costs through responsible power rates. BPA was created to deliver power from the federal hydroelectric system in the Columbia River basin. As the region has grown, BPA's transmission network grew, and it now distributes power from private and other public power producers. The regional transmission system has aged since the most active period of infrastructure development decades ago. Reliability and redundancy standards have also become more stringent. This has led BPA to upgrade and expand its network.

The Kangley–Echo Lake transmission line project was identified as an important improvement to assure power reliability in the Pacific Northwest. The line was a replacement of an existing circuit that needed to be upgraded to meet new reliability standards and to increase capacity. When the project was identified in 1999, no major new transmission lines had been built in the region in the preceding 10 years. The 9-mile transmission line included 5 miles through the Cedar River Municipal Watershed, a 90,546-acre water source for approximately 40% of Seattle Public Utilities' customers and one of only five untreated surface drinking water sources in the United States. The undisturbed and preserved watershed provides natural water filtration most times of the year. However, any new disturbances or environmental degradation in the watershed can cause the source to no longer comply with federal drinking water standards. The other 4 miles of line passed through private lands, including the growing rural residential areas outside of Seattle to the east.

The project was identified to maintain power reliability as peak loads in the region grew and to satisfy treaty obligations to provide power to Canada. The alternatives analysis required trade-offs between heavy impacts on residential areas, environmental sensitivities in an undeveloped watershed, and complex electrical engineering standards to assure reliability. The final project included extensive and innovative mitigation options, including extensive compensatory mitigation by acquiring conservation easements and title to land ripe for development.

Initially all of the construction alternatives that BPA identified passed through the Cedar River Watershed. In 1999, the City of Seattle completed a multispecies HCP to comply with the ESA. The HCP was implemented in part with the passage of an ordinance by the City of Seattle prohibiting commercial logging in the watershed. The HCP was finalized just before BPA initiating scoping by filing an NOI to prepare an EIS to build a line though the watershed. The timing could not have been worse, since the HCP called for no more commercial logging within the Cedar River Watershed for the next 50 years. BPA's project would require the removal of approximately 80 acres of trees in the watershed. This attracted well-organized opposition from environmental organizations and from neighboring communities likely to be affected by the route options. Additionally, the Washington State Department of Ecology made it clear that any impact to wetlands resources would require a 9:1 compensation ratio. Staging

Table 4.4. Kangley–Echo Lake Transmission Line Project Timeline

1962	City of Seattle completes acquisition of all private lands in the Cedar River Watershed.
1989	Last transmission line project completed before Kangley–Echo Lake.
1989	Calls for HCP for the watershed begin.
1996	U.S. Forest Service cedes watershed lands to City of Seattle, placing entire watershed in city ownership. HCP process begins, led by City of Seattle.
1999	HCP for the watershed is approved. City passes ordinance prohibiting commercial logging in the watershed. This ends a contentious process with many stakeholders.
1999	BPA transmission planning identifies Kangley–Echo Lake as a priority, and BPA identifies specific routes across the Cedar River Watershed in preparation of initiating scoping.
2000	BPA issues an NOI in the Federal Register to initiate the environmental review.
November 2002	DEIS issued.
January 2003	Supplemental DEIS released.
June 2003	FEIS issued.
July 2003	ROD issued. Construction starts the very next day.
December 2003	Transmission line completed on schedule, as planned.

areas for the construction cranes would have affected some of these wetlands, triggering a difficult mitigation obligation. BPA worked closely with these groups to provide extensive and innovative mitigation for the project, including

- Developing new construction techniques using micropiles for towers;
- A commitment to not fill a "single square foot" of any wetland type;
- Agreeing to protective construction practices such as the use of helicopter sky cranes, replacement of hydraulic fluid with nontoxic vegetable oil, hand-digging selected footings, and no river crossings by construction equipment;
- Acquiring title or easements to 1,100 acres of forest lands for preservation to compensate for 90 acres of cleared right-of-way;
- Removal of preexisting roads inside the watershed as mitigation;
- Purchasing a $100 million liability policy to cover the cost of a filtration plant in the event that BPA's project should cause a water quality violation leading to a requirement to treat drinking water;
- $6 million in funding for the City of Seattle to protect and restore the watershed further; and
- A promise not to expand the right-of-way in the future.

These mitigation measures and responses to local concerns ultimately resulted in an increase in the environmental quality of the watershed. The improvements primarily came through increased land protections adjacent to the watershed through acquisitions and easements, road removal, and funding for restoration. This project is included as an expedited example because of the high complexity of the environmental challenges the project encountered as it was starting (see the timeline in Table 4.4).

Project Constraints

Stakeholder Controversy and Opposition

BPA entered the planning process without having been involved in the local HCP process, although the agency did have an existing 500-kilovolt line within the watershed that it constructed in the 1970s. The initial set of alternatives all included routes through the watershed, with other nonwatershed routes dismissed early on because of cost and other factors. BPA received comments during the public and agency review of the document that it needed to expand its range of alternatives to include routes that bypassed the Cedar River Watershed altogether. BPA responded to these concerns and others by preparing a supplemental DEIS and releasing the document for another round of review. BPA's preferred alternative remained as it had been, that is, paralleling the existing line through the Cedar River Watershed, taking advantage of the clearing that had already taken place for one half of the proposed right-of-way, and using the existing access roads.

Difficulty Agreeing on Impacts and Mitigation

Although regulated resource impacts were not as great a concern, the concern over impacts to the forested areas and to the drinking water supply set the stage for the project. The development of the HCP had identified some of the key issues and goals for the city as a stakeholder, but assuring that the drinking

water supply would be safe required both innovative construction techniques and risk management tools.

Expediting Strategies

Highly Responsive Public Engagement

After the release of the DEIS, BPA received extensive comments and criticisms of the project and the review processes. It was noted that "commenters spared no one's feelings" in their responses (*7*). BPA immediately responded through additional analyses and negotiations and identified all the details of mitigation in the EIS. Additional analyses were performed to evaluate alternatives that had not been included in the DEIS. While this is not normally an expediting measure, it was necessary to address a broad set of concerns about impacts inside the watershed. The review of these new alternatives adequately addressed concerns by showing the increase in impacts to both landowners and the environment from routes outside the watershed. BPA worked closely with the City of Seattle to negotiate an agreement spelling out how the watershed would be left in a better state after construction of the project. In addition to the city, a number of conservation and environmental stakeholders identified concerns that were addressed in extensive and innovative mitigation measures spelled out in the FEIS.

Up-Front Environmental Commitments

Defining how construction activities may have affected the surface drinking water source in the watershed was a challenge. Turbidity was the primary concern, because elevated turbidity could have triggered an EPA requirement for the City of Seattle to construct a treatment facility. This placed pressure on BPA to protect this resource. BPA identified specific mitigation measures and compensatory resources before finalizing the EIS. After the completion of the environmental review, these measures and resources were specifically described with a high level of detail in the FEIS and carried though to the ROD. As a result, these commitments assured stakeholders and participants that BPA would carry out the mitigation actions. In addition, BPA negotiated an agreement with the City of Seattle that detailed the actions BPA would take and the funding committed to the city. This agreement required BPA to purchase a $100 million insurance policy to be paid to the City of Seattle if construction activities resulted in a need for a treatment plant.

Lessons Learned

The key lesson reported from the environmental project manager was to listen as closely as possible to stakeholders and the public. Early on, adding additional alternatives may have further decreased the environmental review cycle. However, the intense and ongoing collaborative responsiveness to stakeholder and public concerns was critical to project success. Earlier engagement in the environmental processes in the study areas may have also decreased the NEPA time requirement (*7*, *8*).

Lower Manhattan Transportation Improvements Project

Summary

The Lower Manhattan subway was severely damaged in the September 11, 2001, attacks that destroyed the World Trade Center, paralyzing transportation in the area. Several major projects were initiated as part of a program of improvements to restore mobility to Lower Manhattan. Several approaches were particularly helpful in expediting this project, including

- Strategic oversight and readiness assessments to ensure efficient program management and allocation of sufficient resources for each project;
- Aligning expectations of interagency participants up front with regard to what could and could not occur, and soliciting ideas and concerns early;
- Real-time collaborative interagency review and revision of documentation to avoid the delay that can occur from sequential rounds of review and reconciliation of conflicting comments;
- Development of a regional environmental analysis framework and template to provide common methodology and data sources for all projects (this eased review by regulatory agencies and allowed for a cohesive assessment of cumulative effects); and
- Incorporation of environmental and performance commitments, irrespective of project impacts, to address stakeholder concerns and avoid delay due to protracted negotiations.

Two EISs and one EA were completed over a 24- to 27-month period. The average for transit projects is 3.5 years, and the average for highway projects is about 4 years; doing them together can take an average of 7 years. In the New York region, 20 years had recently been spent on the westside EIS. The expediting approaches employed in the Lower Manhattan transportation improvements resulted in EIS and EA development times that were well below national and regional averages (see Table 4.5).

Program Overview

The Lower Manhattan transportation improvements project included a variety of roadway and transit system

Table 4.5. Lower Manhattan Transportation Improvements Project Timeline

September 11, 2001	Terrorist attacks on World Trade Center, Pentagon, and Pennsylvania.
January 10, 2002	Congress passes Public Law 107-117 providing funds for security, capital investments, and ferry projects.
June 20, 2002	Members of the Federal Task Force to Rebuild New York City sign a memorandum of understanding outlining streamlined environmental coordination and review procedures.
August 2, 2002	Congress passes Public Law 107-206, providing $4.25 billion for the rebuilding of transportation infrastructure in Lower Manhattan. Six months later Governor Pataki signs a letter requesting funds for three projects: World Trade Center Permanent PATH Terminal, South Ferry Terminal Station, and Fulton Street Transit Center. In December 2003, funds are requested for Promenade South segment of Route 9A/West Street project.
March 28, 2003	FTA introduces risk management approach to project management.
April–December 2003	Grants are awarded for projects, preliminary engineering, and in some cases, design and construction.
September 3, 2003	Environmental analysis framework is signed by Metropolitan Transportation Authority, Port Authority, and New York State DOT.
May 21, 2004	Signed categorical exclusion for parts of Fulton Street Transit Center.
August 10, 2004	Signed programmatic agreement for the South Ferry Terminal outlining approach to preserving historic resources.
August 30, 2004	Signed FONSI for South Ferry Terminal Station project.
November 22, 2004	Signed environmental ROD for Fulton Street Transit Center project.
April 19, 2005	Signed MOA (Section 106) for World Trade Center Permanent PATH Terminal.
May 13, 2005	Published FEIS for World Trade Center Permanent PATH Terminal.

improvements. FTA approved $4.25 billion to fund several major projects. The following projects are far too complex to describe in this case study and can be looked into separately for the primary transportation components of this program:

- Battery Park Enhancements;
- Brooklyn Bridge Rehabilitation;
- Fulton Street Transit Center;
- South Ferry Subway Terminal; and
- World Trade Center Transportation Hub.

EPA told FTA and FHWA that the projects would not be able to advance without a cumulative impacts assessment. Ultimately, EPA played a pivotal role in working out a common framework for analysis. This was a national streamlining project with Cabinet-level coordination. The process was designed to enable groups to come to agreement earlier rather than later.

Project Constraints

The scope, complexity, and urgency of the Lower Manhattan transportation improvements are unusual, as are the magnitude of the constraints facing the lead agencies and the tools at their disposal. However, some constraints (briefly outlined below) and the strategies employed to address them have broad applicability to less unusual circumstances.

Unusually Large Scale of and/or Complex Project or Program

The program entailed a variety of agencies with differing involvement and interests in each project. Providing cohesive program management across all the projects and parties involved posed a significant challenge.

Lengthy Review and Revision Cycles

With so many agencies involved, reviewing documents and decisions could introduce substantial delay if these reviews were not well coordinated. Interagency review and revision cycles often delay projects, and this program was especially vulnerable because of the many agencies involved and the high demands the program placed on them.

Issues Arising Late Cause Project Change

With so many agencies involved, and the issues to be addressed so complex, the program was especially vulnerable from unanticipated issues cropping up or participants raising new concerns late in the process.

Difficulty Agreeing on Impacts and Mitigation

The many different parties involved meant that agreement on how to evaluate impacts and design appropriate mitigation could delay decision making and progress. A cohesive approach

for assessing impacts and developing mitigation would be needed to streamline this activity across all the projects. Cumulative effects would be especially challenging if assessed separately for each project by different teams.

Stakeholder Controversy and Opposition

The projects in this program entail major changes to transportation infrastructure within an area that is very densely developed and actively used by the community. Many stakeholders held serious concerns about the effect of these projects on the natural and built environments.

Expediting Strategies

The Lower Manhattan recovery transportation improvements included many expediting strategies to deliver the improvements quickly. The following sections outline strategies that addressed the constraints described above.

Strategic Oversight and Readiness Assessment

With regard to the federal transportation improvements in the region, federal oversight agencies, particularly FTA, worked out project development agreements with all the project sponsors and did readiness assessments. FTA examined the capacity of the sponsoring agencies to marshal projects of this size by reviewing their accounting systems, environmental staff resources, and engineering and design capabilities. After this review, FTA indicated to the project sponsors the areas in which they needed to strengthen their staffing and resources.

Elements of the strategic oversight included

- An early partnering agreement between FTA and each project sponsor that established environmental actions; project scope, schedule, and budget; and project oversight protocols.
- A team of FTA staff and contractors working in the areas of project management oversight, financial management oversight, procurement systems reviews, and environmental processes.
- An FTA-developed risk oversight approach to customize the level and kind of oversight for each project.
- A risk assessment profile approach developed by contractors to measure the adequacy of time and contingency for building each project.
- Construction agreements by FTA and project sponsors covering project scope, schedule, and budget. These agreements provide a streamlined approach to managing each project.

Facilitation to Align Expectations Up Front

FTA invested in a facilitator at the outset to coordinate among all the parties and to align expectations. This person facilitated discussions at the outset of the program, solicited agencies' desired outcomes and concerns, and provided a forum for FTA and other leads to explain the boundaries and constraints imposed on the program. These actions helped to avoid future disappointment and disagreement from agencies seeking specific outcomes and reduced the possibility of unanticipated issues arising late during project development.

Real-Time Collaborative Interagency Reviews

At the outset of the program, FTA developed memoranda of understanding with other federal agencies that defined responsibilities for drafting and reviewing specific documents and sections. A federal interagency review team was established to expedite agencies' reviews and make the revision process quicker and more effective.

In some cases, the revision process was done in real time, with all reviewing parties in a room together and the documentation projected on the wall. This facilitated reconciling conflicting comments, produced a revised draft that had the agreement of all necessary parties, and prevented subsequent rounds of review and revision. These meetings were resource-intensive, but ultimately they provided significant cost savings by making the project go faster. One interviewee explained, "It seemed extravagant but all found it very worth it in the end, to the extent it was considered as a way to go in the future."

Regional Environmental Analysis Framework

A regional environmental analysis framework was developed to facilitate a common approach for evaluation of impacts and designing mitigation across all projects, so that the analysis and document contents were standardized and cumulative effects were evaluated programmatically. The framework expedited review times by making the documents consistent and easier to understand and by facilitating evaluation of resource issues across projects. The foundation of this approach was based on a commitment to the application of a common set of methodologies, data sources, and assumptions for the evaluation of effects across projects.

The cumulative effects analysis focused only on those environmental areas identified as subject to potentially significant adverse cumulative effects. In a coordinated effort, the federal partners and project sponsors identified five key environmental assessment areas: air quality, access and circulation, noise and vibration, cultural and historic resources, and economic factors. Focusing the analysis of cumulative effects on

those areas most likely to affect decision making improved understanding of the trade-offs and choices for major decisions. Finally, as each project matured through the NEPA process, the findings of the project were incorporated into the cumulative effects analyses for the projects that follow it. Thus, the project on which findings have been issued can constitute an existing condition for the cumulative effects analysis of the next project.

Up-Front Environmental Commitments

A system of environmental performance commitments was incorporated into projects irrespective of the extent of impact. This enabled parties to get what they wanted and meant that they did not have to go through a more lengthy process of developing data and arguments supporting their position. Participating parties could focus on what they could accomplish together. On the Lower Manhattan Bridge project, an interviewee stated, this "really unlocked coordination in a way that isn't typical of the NEPA process." The various agencies collaborated to ensure that resources would not be damaged without derailing progress by debating impacts and appropriate mitigation. Specific commitments pertained to noise, air quality, the use of ultra-low-sulfur diesel fuels, traffic mitigation plans, and documentation of historic resources (buildings and archeological resources).

Lessons Learned

The Lower Manhattan transportation improvements project provided many lessons learned in project management and coordination. Great efficiencies can result from early coordination, a more structured process, and associated agreements and commitments. One interviewee on the project noted several lessons learned detailed here. "Over-design is often a preferred solution/response to differences. A lot of time there is the belief that if we just do that "right" or "better," whatever issues there are will be resolved. But most problems are more subtle and personal than that, though the problems come disguised as technical issues." New data and the advent of various technologies often bring hope of expediting a project. However, with a proliferation of information "people sometimes get stuck in resolving technical issues that may or may not be germane to decision making," says the interviewee. "All these people are trying to advance their resource and point of view and are focused on finding data to provide it."

Establishing and getting early agreement from the resource agencies in an environmental analysis framework was enormously valuable and a huge time savings. It streamlined the consideration of many comments and probably eliminated the need for many comments that might otherwise have occurred, along with the attendant responses. The interviewee commented that from a public service perspective, if she was a DOT she would require each MPO to set up an environmental analysis framework. "Why pay consultants to re-invent the wheel? Our state of knowledge and practice evolves, but so much could build on each other. And then people can be allowed to deviate, but for a reason, not just because consulting companies (want to) do things differently."

Great efficiencies can result from early coordination, a more structured process, and associated agreements and commitments. Moving beyond having to prove points (e.g., amount of impacts) opened up the discussions and enabled them to take a positive direction (*9, 10*).

Maryland Intercounty Connector Project

Summary

The Maryland Intercounty Connector (ICC) was proposed as a six-lane tollway, approximately 18 miles long, to provide an east–west link between I-270 and I-370, approximately 10 miles north of the existing beltway (I-495) around Washington, D.C. By linking these corridors, the ICC will reduce the cross-county traffic that currently overburdens the hilly, two-lane east–west roads.

The ICC is intended to

- Increase community mobility and safety;
- Facilitate the movement of goods and people to and from economic centers;
- Provide a cost-effective transportation infrastructure to serve existing and future development patterns reflecting local land use planning objectives;
- Help to restore the natural, human, and cultural environments from past development impacts in the project area; and
- Stimulate new transit growth through the creation of additional express bus routes along the corridor.

This case study describes how the Maryland State Highway Administration (MSHA) expedited the ICC project by using substantial environmental commitments and a consolidated project-level decision council to streamline decision making.

Project Overview

The ICC has been included in master plans for Montgomery County and Prince George's County for over 50 years. The National Capitol Planning Commission first introduced the concept of an east–west highway in the 1950s as part of a larger outer beltway around Washington, D.C. The outer beltway idea was later dropped, but the segment between I-270

and I-95/US-1, which became known as the ICC, was retained in plans to address a need for improved east–west mobility between those two north–south corridors. In 1972, the Montgomery County Planning Board recommended, and the Montgomery County Council approved, the alignment of a new highway east of I-270 and north of Rockville to the eastern border of Montgomery County.

MSHA started the first NEPA analysis of an ICC in 1979, issuing a DEIS in 1983. In the 1980s, several federal reviewing agencies expressed concern about the impacts of an ICC project on the natural environment. MSHA later became concerned that much of the socioeconomic data and traffic forecasts on which the need and design of the ICC were based had become outdated since the 1983 DEIS. MSHA initiated a new ICC planning study in 1991 and published a new DEIS on March 3, 1997, but no final decisions were made on the study.

MSHA and the other lead agencies restarted ICC planning efforts in 2004 when the project was identified as a high priority by the state governor. The project's purpose and need was based on a combination of existing and future needs. Population in the area had grown by 28% over the past two decades and was expected to continue to grow, leading to a projected 29% growth in traffic in the study area by 2030. MSHA also identified a need for a connection between the two north–south corridors of I-95/US-1 and I-270, the most intensive employment, residential, and transportation corridors in Maryland. The ICC project's timeline is illustrated in Table 4.6.

Project Constraints

Stakeholder Controversy and Opposition

The ICC faced significant challenges by proposing a new corridor with substantial socioeconomic and environmental implications in an area rich in natural resources. As originally planned, the ICC would have caused the bifurcation of seven major parks, eradication of 746 acres of forests, filling of 48 acres of wetlands, piping of 38,100 feet of stream channel, and major impairment of the last trout stream in the Washington, D.C., metropolitan area. Thus, while this project faced many significant challenges to expediting project delivery, perhaps the most significant was addressing the concerns from stakeholders and resource agencies about impacts to the natural environment and communities surrounding the project corridor. The ICC project had been stalled during two earlier attempts, in the 1980s and 1990s, due in part to significant concerns from federal and local agencies over impacts. Developing a project that would be acceptable to local constituents, stakeholder organizations, and resource agencies would require avoiding and reducing impacts throughout the corridor and developing substantial mitigation and enhancement.

Table 4.6. Maryland Intercounty Connector Project Timeline

2004	ICC NEPA study begins.
November 2004	DEIS published.
January 2006	FEIS published.
May 2006	ROD published.
June 2006	U.S. Army Corps of Engineers issued a Section 404 permit.
Mid-2007	Construction begins.
Late 2011	Main-line road is scheduled to be completed.

Slow Decision Making and Inability to Maintain Agreement

Slow decision making and the inability to maintain agreements constituted two other important challenges confronted by the ICC project team. Projects of the scope and complexity of the ICC encounter many difficult decisions that can be slow and arduous to make, and sometimes must be reopened on especially controversial issues. At the outset of the project, MSHA recognized that timely, effective decision making would be both crucial to expediting delivery and a significant challenge.

Expediting Strategies

Up-Front Environmental Commitments

Environmental enhancements were a major part of the project early on. The ICC explicitly included environmental stewardship as part of the project's stated purpose and need, which helped MSHA incorporate environmental stewardship in nearly every aspect of the project in a proactive way that did not require extensive demonstration of impact.

The revised ICC design minimized or avoided most of the initially anticipated environmental impacts. Additionally, the project made significant improvements to the natural environment and adjacent communities above and beyond mitigation requirements. The project included initiatives that went far beyond regulatory compliance, such as correcting environmental problems unrelated to the highway that otherwise would have remained unaddressed. These included 63 environmental stewardship projects addressing environmental stresses caused by past development in the area, combined into approximately 50 design–bid–build contracts

with an estimated value of over $97 million. These stewardship and mitigation projects include the following:

- Nearly 74,000 linear feet of stream restoration in local watersheds. To the 21,000 linear feet required for mitigation, MSHA added restoration projects along 53,000 linear feet of streams in 26 sites to help achieve state, federal, and local wetland and watershed restoration priorities.
- 1,500 linear feet of fish-passage work, which will remove or bridge blockages, enabling fish to reach prime upstream spawning areas.
- More than 83 acres of new wetlands at seven major sites.
- Approximately 4,300 acres of water quality and stormwater management improvements, including state-of-the-art stormwater controls and 16 stormwater management sites, in each of the major watersheds.
- 21 projects, totaling 620 acres, aimed at improving water quality, protecting brown trout, and addressing other environmental conditions (350 acres were required for mitigation).
- 44 bridges and culverts (in addition to the bridges at major stream crossings) to provide safe passage for deer and small mammals.
- More than 700 acres of reforested land to create new forest habitat.
- Over 775 acres of new parkland to mitigate the approximately 88 acres that will be used for the ICC.
- Wildlife passage at 26 roadway crossings.

Overall, the project includes $370 million in environmental mitigation and enhancement—more than 15% of the total project cost. More than $100 million was earmarked for mitigation and stewardship, but an additional $270 million is for voluntary enhancements.

Consolidated Decision Council

The significant implications, costs, and potential impacts from construction and operation of the ICC had stalled two earlier attempts to develop this project during the 1980s and 1990s. Because of these challenges, the ICC was designated by the U.S. Secretary of Transportation as a high-priority project as described in Executive Order 13274. This prompted state and federal agencies involved in developing, reviewing, and/or permitting the project to commit their top executives to form a project-level oversight group to assist decision making involving policy-level issues. This group, referred to as the Principals +1, comprised the top executive and one technical staff member of each agency. The Principals +1 met quarterly and on an as-needed basis in the event that the project required their direction immediately to maintain progress and avoid delay.

This oversight group was instrumental in helping the project to maintain progress and reach challenging milestones on time by providing guidance to project-level staff and the authority to negotiate and broker compromises needed to advance a decision. The executives were especially helpful when the project faced issues that required action or decisions outside of their agency's standard protocols or policies. For example, resource agencies desired bridges that would clear span stream crossings, but in some cases this required nontraditional bridge designs that project engineers were not initially comfortable committing to because of the higher cost and less common construction techniques required. The MSHA administrator gave project staff the authority to commit to the bridge designs needed to clear span the crossings and meet the interests of the resource agencies.

Regular meetings with the Principals +1 group also helped to maintain momentum and avoid slower progress on more routine issues. Project-level staff from these agencies knew they had to report their progress to their agency's executive, which provided motivation for staff to make progress and not allow decisions to languish. By working and communicating directly with technical staff, the agency executives helped to refocus discussions toward a solution, rather than a protracted debate, and provided guidance and direction when necessary. This frequent involvement from staff at the highest level signaled the commitment of their agency to the ICC that percolated throughout the agencies' culture and the staff working on the project.

Lessons Learned

The ICC project illustrates the breakthroughs that are possible with an exceptional environmental offer by the state transportation agency. MSHA offered many environmental enhancements up front and/or at the suggestion of agency partners that turned the ICC into an environmental benefit rather than a negative environmental impact. Agencies that might have been project opponents became project proponents as a result of the environmental benefits that would be contributed by the project and the rigorous protections MSHA was willing to put in place for wetland protection and restoration, sediment control, and monitoring and enforcement.

An important lesson learned from the environmental commitments included in the ICC is the need to demonstrate to resource agencies and interested stakeholders that the environmental benefits of these commitments will be fully realized. ICC built trust with these parties by committing to on-site, highly qualified environmental inspectors to ensure that construction activities abided by the project's permits and any other agreements with applicable stipulations about construction techniques and performance measures. These inspectors provided a higher measure of assurance to resource agencies that the project's effect on the surrounding

environment would be at or below agreed-on thresholds. An important provision of this commitment was that the independent environmental monitor reported not to the ICC project team or MSHA at large, but to several environmental regulatory agencies. If permit violations or other problems were observed, the independent environmental monitor would report them directly to these resource agencies (*11–15*).

Milton–Madison Bridge Project

Summary

The Milton–Madison Bridge Project seeks to improve the crossing over the Ohio River between the towns of Madison, Indiana, and Milton, Kentucky. The Indiana DOT (INDOT) and Kentucky Transportation Cabinet (KYTC), in partnership with FHWA, completed an EA, Section 4(f) evaluation, and Section 106 MOA in an accelerated time frame in order to meet the deadlines required to be eligible to receive funding from the Transportation Investment Generating Economic Recovery (TIGER) federal stimulus program. The project team used two major approaches that were particularly helpful in meeting this time frame:

- A project-level management group that effectively made decisions on time to address critical path issues and adopted a dispute-resolution process; and
- A media relations manager who helped the project to develop a clear strategy for communicating with the media and anticipating potential controversy.

Project Overview

The Milton–Madison Bridge across the Ohio River between Madison, Indiana, and Milton, Kentucky, follows US-421 and was built in 1929. Eighty years later, the bridge has deteriorated structurally, and the narrow width (20-foot roadway cross section) makes its design obsolete for modern traffic. A 1995 study ended early after an inspection found deficiencies that required immediate attention. Plans for a new bridge were put on hold while a $10 million rehabilitation was performed to extend the life of the existing structure 10–15 years.

In 2008, INDOT and KYTC began a project to study alternatives for replacing the existing crossing with a bridge that would avoid the significant rehabilitation costs required to retain the current structure while ensuring that it would safely accommodate motorists, bicyclists, and pedestrians. An EA evaluated several alternatives, including a major rehabilitation, several new bridge locations, and replacing the superstructure on the existing bridge piers.

The superstructure replacement was identified as the preferred alternative. This involves removing the existing steel superstructure and replacing it with a new wider truss superstructure. The road deck will be rebuilt twice as wide as the current bridge to accommodate two full-width lanes and emergency shoulders that can be used by bicyclists. A pedestrian walkway will be cantilevered from the bridge deck. The existing piers will be reused by retrofitting and widening them to modern standards. Minimal changes will be made to the roadway approaches to the bridge. Construction of this project will require closure of the bridge for 12 months, during which a free ferry service will transport travelers across the river (see Table 4.7 for the project timeline).

Table 4.7. Milton–Madison Bridge Project Timeline

1929	Construction of the existing bridge.
1995	Initial planning study considers improvements to the river crossing.
1997	Rehabilitation of the bridge extends its life for 10 to 15 years.
Summer 2008	FHWA, INDOT, and KYTC begin environmental evaluation for existing project.
Spring and summer 2009	Evaluation of alternatives.
Fall 2009	Selection of preferred alternative.
December 2009	EA issued for public comment.
February 2010	Announcement of TIGER grant for Milton–Madison Bridge project.
March 2010	FHWA issues FONSI and Section 4(f) evaluation.
September 2010	Proposed letting date for design–build contract.
September 2012	Anticipated completion of construction of superstructure replacement.

Project Constraints

The Milton–Madison Bridge Project faced a variety of obstacles, many of which are common to projects to replace and improve transportation infrastructure. Two such obstacles that were successfully addressed through innovative approaches were delayed or revisited decisions and negative or misinformed media coverage.

Slow Decision Making and Inability to Maintain Agreement

One obstacle faced by many projects is the difficulty project management encounters in making decisions on a wide range of complex, often controversial issues relatively quickly and in an effective manner that minimizes the need to revisit the topic or change the decision. The difficulty of quick, effective

decision making on the Milton–Madison Bridge project was exacerbated in two ways. First, the project spanned two states, which effectively doubled the agencies sponsoring the project: two DOTs and two state FHWA offices. Second, the project's timeline was compressed in order to meet the deadlines imposed by the federal stimulus (TIGER) funding sought by the project. A complex project management structure and shortened timelines introduced additional impediments to making timely and effective decisions.

Negative or Critical Coverage from the Media

Many projects encounter challenges when media coverage highlights or stokes controversy and opposition. A variety of factors can create or contribute to these difficulties. Project leaders can fail to anticipate hot-button issues with local media outlets or stakeholder groups, or they may identify them but not develop effective methods for addressing these issues or working with these groups. Transportation agencies often struggle to communicate information, either in meetings or via press releases, that both anticipates and clearly addresses topics of potential interest and concern to the press and their public audience.

Expediting Strategies

Three expediting measures were used successfully in the Milton–Madison Bridge project to avoid or minimize the detrimental effects of the constraints described above.

Consolidated Decision Council

The project formed a consolidated decision council called the Milton–Madison management team (M3T) to facilitate the rapid and effective decision making needed for the project team to stay on track with their aggressive schedule. A project management team is commonly formed on medium and large projects, but these teams are not always successful at reaching consensus and making decisions quickly enough to avoid delay, especially when schedules are compressed. Several factors contributed to the success of M3T.

FHWA was a key member of the group. Many projects coordinate with their federal leads through processes separate from the typical DOT or MPO management meetings. M3T included FHWA early in the project's development, which allowed FHWA to understand and participate in the decision making throughout early design and environmental evaluations. Their early involvement helped streamline later decisions, such as the review and approval of the EA.

The core group was small. Each of the project's lead agencies—INDOT, KYTC, and FHWA—committed a single senior-level staff person as the primary M3T member. This helped keep M3T discussions focused by providing a single voice from each agency during decision making. The Indiana FHWA office deferred primary involvement to the Kentucky FHWA office. Staff from both offices worked together outside of M3T to minimize the number of staff members who actively participated in this group while ensuring the FHWA staff member represented the opinion of both state offices.

M3T staff could easily and directly contact the executives of their respective agencies. Such communication was critical for decisions that needed input or confirmation from agencies' top leadership, and it effectively expanded the capabilities of M3T to make decisions without delay.

Meetings were frequent, with decision topics identified in advance. M3T met every 2 weeks and relied on project e-mails 1 week before each meeting to identify necessary decisions and information relevant to that topic. These e-mails were developed by and sent to the larger project team. This allowed a week for the project team to work with M3T members in advance of the meetings so they could make better-informed decisions. When possible, decisions were made at the first M3T meeting after their identified need, but decisions sometimes required the group to wait until the next meeting (2 weeks later). With this approach, it rarely took more than 3 weeks for M3T to make a decision when it was needed to meet the project schedule.

Dispute-Resolution Process

A dispute-resolution process was important at several key points. Developing consensus among multiple agencies is often challenging, so it is crucial for a multiagency project team to develop a dispute-resolution process to avoid an impasse if debate becomes protracted. M3T members understood early on that they would need to elevate some decisions to executive leadership quickly if they couldn't get consensus in the time frame needed to maintain the project schedule. This proved important when the two DOTs had to decide whether to restrict the project boundary to just the river crossing in order to complete NEPA Section 4(f) and Section 106 studies in time to receive TIGER funding. In this case, the Indiana Transportation Commissioner, in consultation with the governor, needed to provide approval to remove some approaches on the Indiana side of the river from the project's scope.

Media Relations Manager

The project team hired a dedicated media relations manager with significant career experience in the news industry as a reporter, producer, and news director. The media relations manager had three primary functions that helped the project to avoid some of the delays that can occur on projects that run afoul of local media coverage and stakeholder reactions.

The media relations manager developed and implemented a simple and consistent strategy for working with local media outlets. A fundamental element of this strategy was early identification and clear communication of the key expectations of the agencies leading the project, such as the need for a single bridge that could be largely paid for with state funding. The media relations manager helped to craft these expectations in a form that was easily communicated to reporters and stakeholders, so they could later understand the rationale behind any controversial decisions, such as the narrowing of alternatives and ultimately the selection of a preferred alternative.

The media relations manager anticipated pitfalls when communicating with the media. The media relations manager's experience in the news industry helped her to identify hot-button issues with local media outlets and foresee how information could be misunderstood. For example, she organized a meeting with the editor of a local newspaper whom she heard was planning to publicize opposition to the project's preferred alternative. The project team was able to preemptively meet with this editor to explain the reasons behind the selection of the preferred alternative. After the meeting, the editor said she had gained a greater understanding of the decision. She changed her opinion of the preferred alternative and wrote an editorial reflecting that. Ultimately, there were no major surprises during the public involvement process or in the reporting on the project.

The media relations manager adapted information to be easily understood by the media and public. The media relations manager helped to craft news releases, public meeting materials, and other project information materials produced for external distribution in a vocabulary and structure that could be readily understood and used by the media. This often entailed translating engineering or scientific jargon into terms that stakeholders could understand and refocusing the presentations on topics of interest to stakeholders. For example, the lead agencies initially identified a "defensible NEPA document" as a key expectation. This was modified to "developing a solution that is environmentally acceptable" in order to be better understood and remembered by local media and the public, as this expectation later shaped decisions.

Lessons Learned

The Milton–Madison Bridge project successfully addressed two issues that can commonly delay transportation projects: (*a*) how to make decisions quickly and effectively to maintain progress on the critical path and (*b*) how to proactively engage the media and project stakeholders in a manner that avoids or diffuses controversy. Neither approach was revolutionary, but rather a refinement and successful implementation of techniques that are common in transportation projects. Many projects form management teams with the intent that they will make decisions when needed, and most projects have staff at least partially dedicated to public engagement. The success of the Milton–Madison Bridge project lay in the details of how the team addressed these common issues.

Complex or multijurisdictional projects can result in large management groups, and decision making can suffer because of this size or an unclear decision-making approach. M3T addressed these challenges by forming and maintaining a small core group of decision makers, despite the two-state project area and the involvement of the federal lead agency in this group. M3T members met regularly together and with their agencies' executives to ensure that decisions on the critical path could be made on time. Many projects would benefit from considering smaller decision-making groups, closer involvement of the federal lead agency (or agencies) in their decisions, and ensuring a strong connection with the sponsoring agencies' executive leadership.

Despite the best intentions, coordination with the media and stakeholder groups can degrade as unexpected issues become contentious or simply because of miscommunication. The Milton–Madison Bridge project illustrates the benefits of retaining staff with journalism experience to help anticipate potential pitfalls with reporters, enabling the project to proactively address these issues instead of responding to them after they have already sparked controversy. Projects with any likelihood of controversy would benefit from retaining assistance from individuals with career experience in media relations and public engagement so that they can assist project engineers and planners working with stakeholder groups.

Missouri I-70 Tiered NEPA Evaluation Project

Summary

The Missouri DOT (MoDOT) and FHWA used a tiered NEPA process to effectively integrate the planning and environmental phases of the I-70 corridor program. Conducting a planning-level study in a Tier 1 EIS allowed MoDOT to get a quick decision on the preferred strategy for addressing problems in the I-70 corridor with buy-in from FHWA and key resource agencies. This decision consequently provided a reliable basis for further development and evaluation of alternatives in Tier 2 NEPA studies. Many agencies experience schedule delay, and in particular, extensive reworking of earlier decisions and inability to maintain agreements, when implementing the tiered NEPA process. This case study illustrates how a tiered NEPA process can help transportation agencies to address complex problems by documenting decisions at interim milestones and allowing planning work to better inform later phases of design and environmental evaluation.

Project Overview

I-70 in Missouri was constructed in the 1950s, spanning approximately 200 miles between Kansas City and St. Louis. I-70 is the primary east–west corridor in the state, with some segments carrying well over 100,000 vehicles each day. Traffic congestion and safety are currently problems in many areas along the corridor because demand exceeds the capacity and design of the freeway. Projected growth in statewide population and employment predicts these problems will increase.

MoDOT and FHWA conducted a statewide feasibility study to explore methods for addressing the problems in the I-70 corridor. This study documented the condition of I-70 and evaluated its capacity, safety, traffic conditions, and how it could be expected to operate in the future. The outcome of this study indicated the need for comprehensive improvements to address current and predicted problems along this corridor. Because of the size, cost, and complexity of a comprehensive solution and possible impacts to communities and the environment, MoDOT and FHWA evaluated alternative methods of addressing the needs of this corridor via a two-tiered NEPA process.

The Tier 1 EIS looked broadly at a range of statewide solutions for the I-70 corridor and recommended a general improvement strategy. The first tier had four goals:

1. Approval of a general strategy for improving I-70;
2. Identification of sections of the I-70 corridor for second-tier studies;
3. Documentation that could be referenced by second-tier studies to eliminate repetitiveness; and
4. Development of agency and public consensus for the overall improvement plan.

Six alternatives were evaluated in the Tier 1 EIS, including no build, demand management, widening I-70, a new parallel corridor, HOV lanes, and high-speed passenger rail. Widening I-70 by expanding the right-of-way width from roughly 400 feet to approximately 500 feet was the preferred strategy identified in the Tier 1 ROD. Rural portions (80% of the corridor) would be widened from four lanes to six lanes, and urban areas would be widened from eight lanes to ten lanes. The Tier 1 EIS also identified seven sections of independent utility to be evaluated separately in Tier 2 documents.

The second-tier projects consisted of two EISs, four EAs, and one categorical exclusion, each relying on the decisions made in the Tier 1 ROD. In particular, each Tier 2 evaluation began with a range of alternatives defined by the selection of the strategy to widen the existing I-70 corridor. The Tier 1 evaluation also informed the Tier 2 studies' identification of secondary and cumulative effects. Ultimately, the seven Tier 2 evaluations were completed in 4 years (see Table 4.8 for the project timeline).

Table 4.8. Missouri I-70 Tiered NEPA Evaluation Project Timeline

1999	MoDOT begins a feasibility study to document the condition of the I-70 corridor.
January 2000	FHWA issues an NOI to begin the I-70 improvement study as a Tier 1 EIS.
December 2001	FHWA issues a ROD on the Tier 1 EIS, selecting a preferred strategy for improving the corridor.
2002	MoDOT launches the I-70 improvement program by beginning separate but coordinated Tier 2 NEPA evaluations of seven sections of the Tier 1 corridor.
2006	MoDOT and FHWA complete the last of the seven Tier 2 evaluations.

Project Constraints

Unusually Large Scale of and/or Complex Project or Program and Inability to Maintain Agreement

MoDOT faced a daunting challenge when it decided to comprehensively approach the congestion, mobility, and safety problems throughout the I-70 corridor. The geographic scale, complexity, and diversity of problems along the corridor and the scope of needed improvements necessitated a programmatic evaluation before beginning work on individual projects. When faced with similar challenges, many DOTs have employed corridor studies before initiating NEPA evaluations. The transition from corridor study to project-level NEPA can introduce challenges for the lead agencies when they attempt to leverage the work they completed during the planning phase. Valuable work done during the planning phase, such as scoping and stakeholder outreach to define the problems, as well as early identification and screening of potential alternatives, can be difficult to rely on once NEPA is initiated. In many cases, transportation agencies decide to revisit work done during planning after they issue an NOI. This decision can require duplicative evaluation and coordination, introduce greater confusion for the public, and generally result in a longer NEPA process than if the work and decisions in the planning phase were fully leveraged.

Expediting Strategy

Tiered NEPA Process

MoDOT staff identified a tiered NEPA process as a possible method for approaching the problems in the I-70 corridor early in their deliberations with FHWA. Ultimately, MoDOT and FHWA agreed to use this method because it could address

several challenges. The following steps were taken to implement this strategy:

- *Make strategy decision quickly.* From the initial feasibility study in 1999, MoDOT realized there were several fundamentally different strategies for addressing the problems in the I-70 corridor, including building a new corridor, constructing high-speed rail, or making improvements to the existing corridor. MoDOT wanted to make a decision about the preferred strategy quickly so that work could then focus on alternative designs. To do this, MoDOT wanted official buy-in from FHWA before moving forward on detailed development and analysis of alternatives. Tiering allowed for separate levels of formal decision making under NEPA by establishing a Tier 1 ROD and subsequent Tier 2 decisions. MoDOT and FHWA clearly defined the goals of the Tier 1 process up front to focus on the overall strategy for addressing the problems in the I-70 corridor, leaving the engineering and detailed alternatives evaluation for the second-tier processes. This arrangement allowed for a relatively rapid Tier 1 EIS (less than 2 years) that culminated in a reliable decision for how MoDOT should proceed.
- *Identify individual projects within the corridor.* The Tier 1 EIS identified the sections of the I-70 corridor that could be evaluated and undertaken as separate projects in second-tier studies. These sections would be manageable for more detailed environmental analysis and engineering, funding, and construction. Under NEPA, these individual projects must meet several criteria in order to be evaluated and constructed separately. The Tier 1 EIS provided the analysis and documentation necessary to establish the limits and extent for these second-tier studies.
- *Provide documentation to be referenced by second-tier studies.* FHWA's involvement in the planning study helped MoDOT and the consultant team to conduct analyses and provide documentation in the Tier 1 EIS in a manner that could be easily referenced in the second-tier documents with little or no adaptation. Indirect and cumulative effects were especially useful in the Tier 1 EIS, as these issues were best addressed at the corridor scale. While the Tier 2 documents did look at these issues for their individual project areas, they relied heavily on the Tier 1 document for its corridor-wide analysis.
- *Garner resource agency input on strategy.* Performing the planning study under NEPA helped MoDOT get more involvement and buy-in from some key resource agencies that are not typically involved during this early phase of project development. These agencies included EPA, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the state's Department of Natural Resources. FHWA's involvement and the initiation of NEPA during the planning phase helped MoDOT to gain input from these agencies on the selection of an overall strategy. MoDOT held quarterly meetings with several resource agencies to get their feedback on potential concerns or benefits associated with the strategies being considered and their relative merits from the regulatory purviews of these agencies. Ultimately, this gave MoDOT a greater degree of certainty that the decision on a preferred strategy and the supporting evaluations would not have to be revisited during the second-tier project-level studies or permitting.

Lessons Learned

A tiered NEPA process helped MoDOT to effectively and efficiently study how to address the problems in the I-70 corridor. Despite their success, MoDOT noted that a tiered NEPA process is not always helpful and that there were important elements in the I-70 corridor project that made the tiered approach useful. Chiefly, the nature of the problems to be addressed in the I-70 corridor required at least two distinct and sequential levels of decision. MoDOT first needed a decision about the fundamental strategy for addressing the problems in the corridor. The decision about whether to improve the existing corridor was critical to framing the subsequent decisions about the type of improvements along various sections of the corridor. Receiving buy-in from FHWA and some key resource agencies on this first decision allowed MoDOT to proceed with the separate I-70 corridor projects in a more confident and focused fashion than if there had been concern that agencies might later question the underlying strategy.

A second important characteristic of the I-70 program that made a tiered approach effective was that the second-tier decision—evaluating alternative designs for improving I-70—was divided into several separate decisions and separate projects along the corridor. This meant that each project was able to rely on the decision made in the Tier 1 EIS without the need for each to separately approach this issue again.

Many projects are better served by a traditional single-tier NEPA process. If there is a clear approach for addressing a problem, even though there may be variations on the approach that need to be studied, a tiered NEPA process might add unnecessary steps and time by requiring more analysis, documentation, and public comment periods than needed. Similarly, a problem likely to be addressed as a single project may receive less benefit from a tiered process than a problem that is likely to be split into multiple separate projects that could rely on a preceding ROD.

NEPA compliance can be complex and confusing, especially for members of the public who are not familiar with the process. A tiered NEPA process can be doubly complex, which made it especially important for the I-70 project team to develop and maintain a clear message about the

intended progression through the tiered evaluations and decision making. Outreach during the first tier was sometimes difficult because the development of different strategies was very rough and preliminary, which didn't allow for detailed analysis of impacts. This made it problematical for some stakeholders to believe they could contribute meaningfully. The project team needed to continually remind participants of the decision at hand and that more detail and analysis would follow once there was agreement on the preferred strategy for addressing the problems in the I-70 corridor. During the second-tier studies, MoDOT employed a public engagement consultant to provide a consistent message on all the projects.

MoDOT faced similar challenges with resource agencies that were not used to being involved in the planning phase of project development. Initially agencies expected more detailed design information that could facilitate a more nuanced understanding and comparison of impacts. These agencies tended to jump to issues concerning later decisions about project design, which required that project staff bring the discussion back to the decision at hand, that is, whether to improve the I-70 corridor, not how. Overall, it was important for MoDOT and FHWA to clearly define the goals of the Tier 1 EIS and to keep participants reminded of the scope and process of this first tier and what would be addressed later in the second-tier studies.

Recovery Act Broadband Access Program of Actions

Summary

In February 2009, President Obama signed into law the American Recovery and Reinvestment Act (ARRA) of 2009, which appropriated $7.2 billion in loans and grants for the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA) and the U.S. Department of Agriculture's Rural Utilities Service (RUS) to increase access to broadband services in unserved and underserved communities throughout the United States. RUS received $2.5 billion to provide grants and loans for broadband access in rural and remote areas by way of its broadband initiatives program (BIP). Using its broadband technology opportunities program (BTOP), NTIA received $4.7 billion to support grants and loans for projects that map and document existing broadband services; increase broadband use in underserved areas; improve access to local police and fire departments; and provide broadband training and support to schools, libraries, healthcare providers, and other organizations. Under ARRA, all NTIA and RUS grants and loans must be awarded by September 30, 2010.

To meet the compressed and congressionally mandated timeline in which ARRA funds need to be obligated and construction completed, RUS, NTIA, the National Conference of State Historic Preservation Officers (NCSHPO), and the Advisory Council on Historic Preservation (ACHP) undertook two streamlining activities:

- A program comment, signed by ACHP, NTIA, RUS, and the Federal Communication Commission (FCC), which allowed RUS and NTIA to adopt the results of FCC's Section 106 compliance process; and
- A complementary national Section 106 programmatic agreement for BTOP and BIP that allowed for post-award compliance with Section 106 and the exemption of sustainable broadband adoption programs (i.e., educational efforts, training, and support) and broadband over existing power lines projects from Section 106 compliance requirements.

Project Constraints

Inefficient Section 106 Consultation with SHPO

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their actions on historic properties and to provide ACHP with a reasonable opportunity to comment on such actions. ACHP issued regulations (Section 106 regulations, codified under 36 CFR, Part 800) that set forth the process through which federal agencies must comply with these duties.

The available technological solutions for broadband accessibility and use are diverse and include the construction and modification of FCC-regulated communication towers and antennas. FCC, ACHP, and NCSHPO have existing programmatic agreements that direct how FCC meets its Section 106 responsibilities for certain undertakings, including communication towers and antennas: the FCC Co-location Programmatic Agreement (2001) for the co-location of wireless antennas, and the FCC Nationwide Programmatic Agreement (NPA)(2004) for the review of effects on historic properties for certain undertakings approved by FCC.

Through these NPAs, FCC has established a procedure that is supported by approaches to expedite review and facilitate the involvement of stakeholders (including Indian tribes) to ensure that effects to historic properties are taken into account. RUS and NTIA, however, have been unable to use these existing FCC NPAs to meet their individual Section 106 responsibilities. In some proposals submitted to NTIA's BTOP and RUS's BIP, FCC will have regulatory authority over these towers and antennas. In short, for the implementation of broadband projects involving FCC-regulated communication towers and antennas, FCC, RUS, and NTIA would be

required to conduct separate Section 106 reviews for the same proposed undertaking.

Lengthy Review and Revision Cycles

The traditional agency-by-agency, four-step Section 106 review process (initiate consultation, identify historic properties, determine impacts, and resolve adverse effects) can take months to years to complete. This review process usually happens before funds are awarded and would not allow for BTOP and BIP grant and loan processing to meet ARRA deadlines, thereby threatening delivery of funding and concomitant projects.

Expediting Strategy

Programmatic Agreement for Section 106

In the context of the ARRA funding requirements for broadband access, the NPA streamlines the Section 106 reviews through the program comment and the NPA for Section 106 review.

Recognizing the delays that would hinder meeting the September 30, 2010, deadline for awarding funds, ACHP issued a program comment to NTIA and RUS to relieve them of the need to conduct a separate Section 106 review regarding the effects of communication facilities construction or modification that would be subject to such review by FCC (see Table 4.9 for the full timeline).

The program comment applies only to those undertakings reviewed under FCC's NPA or NPA for the co-location of wireless antennas and does not change FCC NPAs or the procedures through which SHPOs, Tribal Historic Preservation Officers, Indian tribes, Native Hawaiian organizations, local governments, and other consulting parties consult about the effects of these undertakings. RUS, NTIA, and the Federal Emergency Management Agency are still responsible for Section 106 reviews for undertakings that include components other than telecommunication facilities construction or modification subject to FCC review. They will not, however, have to consider the effects of the telecommunication facilities construction or modification portion reviewed under FCC NPAs.

In conjunction with the program comment, RUS and NTIA worked collaboratively with FCC and tribal leaders to improve how tribes were notified about Section 106–eligible BIP and BTOP applications. NTIA and RUS use a modified version of FCC's tower construction notification system, an FCC tool and database that allow RUS and NTIA to readily provide reliable information about BTOP and BIP proposals to federally recognized tribes in order to expedite historic preservation compliance.

Based on issues identified in the program comment, the NPA

- Stipulates that as a condition of financial assistance awarded under BTOP and BIP, NTIA and RUS will attach award conditions to guarantee that ARRA funds are not released, and ground-disturbing activities are not started, before the completion of the Section 106 review;
- Allows NTIA and RUS to award BTOP and BIP grants and loans before Section 106 process completion so long as NTIA or RUS requires applicants to begin Section 106 consultation within 90 days after project award;
- Provides NTIA and RUS with the authority to withdraw project awards until completion of the Section 106 review;
- Stipulates that NTIA and RUS will provide applicants with guidance on the Section 106 process, including contact information for people in the respective agencies who will

Table 4.9. ARRA Broadband Access Program Timeline

2001	FCC NPA for the co-location of Wireless Antennas is approved.
2004	FCC NPA for Review of Effects on Historic Properties for Certain Undertakings is approved.
February 2009	President Obama signs ARRA into law. ARRA provides NTIA and RUS with $7.2 billion to expand access to broadband services in the United States.
October 2009	ACHP issues a program comment for RUS and NTIA by unassembled vote. Under this program comment, NTIA and RUS will not be required to conduct an independent review under NHPA Section 106 for the construction and modification of wireless communication facilities already subject to review by FCC under the two NPAs.
October 2009	At the 2009 annual session of the National Congress of American Indians, the general assembly adopts a resolution, "Advancing Consultation Regarding Tribal Section 106 Concerns in the ARRA Broadband Programs."
November 2009	NPA signed.
September 30, 2010	ARRA funds obligated.
September 30, 2013	Ending date of the NPA.
September 30, 2015	Extension of ending date of NPA to take into consideration currently unknown contingencies.

be responsible for answering applicants' questions regarding Section 106 compliance; and
- Encourages BTOP and BIP applicants to design their activities to avoid historic properties.

Lessons Learned

At this time, it is difficult to know how well the NPA will work in terms of Section 106 review schedule compliance, the number of projects that moved from the award to completion stage within the 3-year ARRA schedule, or the number of projects that met or will meet the 5-year ARRA schedule, which was a modification for unexpected contingencies. However, at least some lessons can be taken from this case.

NTIA and RUS worked closely with FCC and several historic preservation, tribal, and telecommunications industry organizations throughout the development of the program comment in the context of ARRA deadlines. Prior to NTIA's and RUS's formal request to ACHP to issue a program comment, they sought to share their intent to develop one with the National Trust for Historic Preservation, NCSHPO, the American Cultural Resources Association, the National Association of Tribal Historic Preservation Officers, the National Congress of American Indians, the Wireless Infrastructure Association, and the Association of Public Safety Communications Officials, among others. In this process, NTIA and RUS documented and reported to ACHP the expressed concerns of these organizations. If these concerns were not addressed in the program comment, they were addressed in the NPA, if possible. This early and continued communication garnered the general support of these stakeholders, thus allowing for NTIA, RUS, and unserved and underserved areas to benefit from ARRA funds for broadband access without compromising the integrity of Section 106 reviews and existing agreements.

Texas Section 106 Programmatic Agreement Program of Actions

Summary

TxDOT, FHWA, the Texas SHPO, and ACHP developed a programmatic agreement to provide a variety of streamlining measures for the NHPA Section 106 compliance process on TxDOT projects. The agreement defines several categories of projects, including those that pose no potential to affect historic properties and thus require no review by TxDOT, FHWA, or SHPO. The primary streamlining element in the agreement is the definition of project types with potential to cause effects (but not likely adverse effects) on historic properties, and the provision that internal TxDOT staff can review and process these projects without formal review or comment from FHWA or SHPO. Instead, TxDOT provides quarterly reports summarizing project activities undertaken with potential to cause effect, rather than requiring a case-by-case review by SHPO for these projects.

This agreement includes a variety of stipulations to streamline the Section 106 compliance process while ensuring the protection it affords is not marginalized. These stipulations include requirements for TxDOT to maintain staff with appropriate expertise in historic and archaeological resources, allowances for the agreement to be updated as its implementation yields opportunities for improvement, and the requirement for continual review and monitoring of how the agreement is used. Overall, the agreement has helped to reduce delay for a majority of TxDOT projects that pose little or no risk to resources protected by Section 106, and has in turn helped TxDOT, FHWA, and SHPO to focus resources on projects that could have adverse effects, thus helping to expedite those projects as well.

Project Constraint

Inefficient Section 106 Consultation with SHPO

Most DOT projects have little or no potential to affect historic or archaeological resources, but are nonetheless often subject to individual project review from SHPO. These reviews can add time and expense to these projects and consume resources in the agencies that might be better spent on projects with a greater likelihood of affecting resources protected under Section 106. The traditional approach of submitting most DOT projects and activities to SHPO individually for review and comment is generally inefficient and may ultimately inhibit agencies' ability to provide the appropriate resources to projects that do pose concern for historic and archaeological resources and that need the attention to avoid unnecessary delays.

Expediting Strategy

Programmatic Agreement for Section 106

FHWA and TxDOT worked with the Texas SHPO and ACHP to develop a programmatic agreement that would significantly reduce the number of TxDOT projects and activities that would require individual SHPO review. The agreement defines three classes of projects or activities:

1. Undertakings with no potential to cause effects to historic properties. These activities are not reviewed by FHWA, SHPO, or TxDOT environmental staff. Activities in this category include roadway maintenance, driveway and street connections, and intersection improvements that require no additional right-of-way.

2. Undertakings with potential to cause effects to historic properties. These activities are not typically reviewed on a case-by-case basis by SHPO. Instead, internal TxDOT staff that meet specified training and experience requirements review these projects for potential effects, including definition of the area of potential effect, determinations of properties eligible for protection under Section 106, and determinations of effects to these properties. If adverse effects are identified, TxDOT staff consult with SHPO and other consulting parties to determine a course of action.
3. Undertakings with potential to cause adverse effects to historic properties. These projects require consultation with SHPO. There are specific provisions for undertakings involving cemeteries or historic bridges.

TxDOT staff estimate that approximately 85% of their projects fall under the first and second classes, meaning that only about 15% of projects proceed with the traditional individual consultation process with SHPO. Projects falling into the first class are streamlined by avoiding Section 106 review from TxDOT environmental staff, SHPO, or FHWA entirely. Documentation on these projects is limited to the engineering material required for design and construction.

Projects that fall under the second class require documentation by the TxDOT environmental staff, and this documentation is compiled and reported to SHPO quarterly. This requirement means that projects with potential effect still take a similar amount of time and effort by TxDOT to determine any effects and to consult with any outside parties, such as Indian tribes. Nevertheless, these projects often have an overall time savings by not needing to wait for SHPO to review the project design, potentially eligible resources, and any effects. Instead, this work, and statistics about how the agreement is being implemented across all TxDOT projects, are compiled into quarterly reports and submitted to SHPO for review. Regular weekly coordination meetings are held with SHPO and TxDOT environmental staff.

Other important stipulations in the agreement include

- FHWA maintains its legal responsibility for compliance with NHPA and the ability to consult directly with SHPO and ACHP if desired.
- SHPO may request an opportunity to comment on determinations of eligibility or findings of effect on projects meeting the second classification criteria (potential to cause effects).
- Tribal consultation is largely unaffected by this agreement. While TxDOT typically carries out most consultation efforts, tribes can always request direct government-to-government consultation with FHWA.
- A dispute-resolution process is outlined. This includes time frames for SHPO to respond with any objections and specifies when objections from consulting parties should cause TxDOT to elevate the issue to FHWA.

The agreement also outlines provisions tailored specifically for activities affecting cemeteries or historic bridges. These are resources protected by Section 106 that are commonly affected by TxDOT projects. TxDOT and SHPO developed provisions for how these resources will be considered during consultation, including methods for determining eligibility for protection under Section 106, methods for assessing potential effects to these resources, and applicable approaches for resolving any effects. These provisions help to streamline the consultation process on projects that may affect these resources because they have established a consultation process and approach already agreed on by TxDOT, FHWA, and SHPO.

Lessons Learned

The programmatic Section 106 agreement has helped to streamline the consultation process for TxDOT projects in three ways:

1. Several types of activities are categorically excluded from Section 106 consultation entirely, greatly reducing the volume of projects and material sent to SHPO;
2. Other projects with potential to affect (but not adversely affect) Section 106 resources are evaluated by TxDOT environmental staff without formally requesting review and comment by SHPO; and
3. Provisions have been established for consultation specific to two Section 106 resources—cemeteries and historic bridges—that are commonly encountered on TxDOT projects.

In practice, each of these streamlining measures has been useful for expediting project delivery, but they rely heavily on continual coordination between staff from SHPO and the TxDOT environmental division. Staff from these agencies meet weekly to informally review upcoming projects and any issues that either agency may see emerging in the application of the agreement. It has been crucial for TxDOT staff to prepare detailed information about projects that have not gone through individual consultation with SHPO in order to compile quarterly reports that include statistics about the trends and activities in these projects, specifically capturing how the projects use the provisions in the agreement. Reporting this information and meeting regularly with SHPO has allowed TxDOT to provide assurance that they are acting in good faith according to the stipulations of the agreement and that there is continual opportunity to refine and revise how the agreement is implemented.

Flexibility to amend the agreement has also been important. The current agreement is the result of several previous amendments, some of which have been simple clarifications

to language. Other amendments have been more significant, such as adding types of projects that are excluded from consultation entirely. The provisions for dealing with cemeteries and historic bridges were added after the original creation of the agreement. TxDOT has found these resource-specific provisions helpful and hopes to include more in the future.

Ultimately, the value of the programmatic agreement has been twofold: streamlining projects with little or no likelihood of adversely affecting resources protected by Section 106 and allowing staff from TxDOT, FHWA, and SHPO to focus their resources on projects that may adversely affect protected resources. Perhaps counter intuitively, this streamlining approach has not reduced the interaction between these agencies, but actually has required and instilled stronger coordination between them in order to ensure the agreement delivers time savings, when possible, while assuring proper compliance with Section 106.

Oregon Statewide Bridges Program of Actions

Summary

The Oregon DOT (ODOT) statewide bridges program developed a streamlined approach for replacing and repairing over 300 bridges around the state. ODOT realized that the standard approach to project development would not allow the state to complete this program within the time frame mandated by the legislature or within the program budget. ODOT partnered with other agencies, stakeholders, and the private sector to redesign the standard approach to project delivery.

Many different practices were developed or adopted to streamline the delivery of the program, including strategies and tools that helped to expedite data collection, permitting, design, contracting, and construction. Compared with the traditional approach to project delivery, this comprehensive approach allowed ODOT to reduce delivery time on some of the projects by as much as 50% and to cut years off the program delivery schedule. The program's commitment to context-sensitive solutions also resulted in greater environmental protection and enhancement than would have occurred with the more typical approach to project delivery. The program received not only FHWA's prestigious Environmental Excellence Award for Environmental Streamlining, but also received the Best Program Award for Environmental Excellence from AASHTO.

The ODOT bridge program faced a number of challenges to timely delivery. ODOT and partners successfully addressed these challenges through numerous strategies that helped to expedite program delivery. This case study focuses on just four of the many strategies employed by the program: early commitment of construction funding, programmatic or batched permitting, performance standards, and dispute-resolution process.

Project Overview

When ODOT identified widespread problems with deteriorating bridges built in the 1950s and 1960s, they quickly realized that the usual approach to funding, permitting, environmental review, contracting, and construction would not work for this program, which required the repair or replacement of more than 300 bridges across the state. One of the first steps they took to develop a more efficient approach to project delivery was to hold a workshop with resource agencies to let them know the problems they were facing and the objectives they wanted to achieve, and to ask the agencies for help in (*a*) understanding what goals and objectives the agencies would like to achieve as part of this program and (*b*) redesigning the coordination, review, and permitting process to achieve the objectives of the DOT and all the resource agencies. This led to substantial changes in the delivery process, including much more detailed and up-front environmental data collection, new programmatic permits, a batched biological assessment, outcome-based permits, a dispute-resolution process, and agency leadership agreements. Overall, the new review process front-loaded much of the process and agreements, was much more collaborative, and was much quicker than the traditional approach.

After ODOT identified the problem and clarified an approach for solving it, the 2003 Oregon legislature passed House Bill 2041, the Oregon Transportation Investment Act III (OTIA III), which provided $1.3 billion for the replacement and repair of bridges on state highways. In response, ODOT developed a project delivery program that would accomplish the following objectives:

- Employ efficient and cost-effective delivery practices;
- Stimulate the Oregon economy;
- Maintain freight mobility and keep traffic moving;
- Build projects sensitive to their communities and landscapes; and
- Capitalize on funding opportunities.

Table 4.10 shows the timeline for the Oregon bridges project. More information is available online for the OTIA III program (*16*) and the environmental tools and strategies developed to expedite project delivery (*17*).

Project Constraints

The ODOT bridges program faced multiple challenges that could have derailed the program or extended the schedule.

Table 4.10. Oregon Statewide Bridges Program Timeline

2002	ODOT identifies widespread problems with deteriorating bridges.
2002	ODOT holds workshops with resource agencies and internal divisions to begin a partnership for developing an approach to deliver the bridge program.
2003	Oregon legislature passes House Bill 2041 providing funding to develop and implement the program.
Early 2003	ODOT contracts consultants to work with them and their partners to collect environmental, engineering, and other data; to involve the public and other stakeholders to better understand the issues and challenges; and to design an approach that will meet program objectives.
2003–2004	ODOT and partners collaborate to develop new strategies to expedite program delivery in a context-sensitive and sustainable way.
April 2004	ODOT contracts with a joint venture of private companies that will manage the delivery of the program.
2005	NEPA review and key federal and state programmatic permits and approvals are completed.
2006	First bridge replacement and repair projects begin construction.
2007	First bridge replacement and repair projects are completed.
2013	Projected construction completion for the last of the bridge replacement and repair projects.

This case study discusses just three of the barriers: significant and diverse environmental impacts and issues, a large number of permitting agencies with overlapping jurisdictions, and a program of unprecedented scale and complexity.

Conflicting Resource Values and Difficulty Agreeing on Impacts and Mitigation

The bridges program faced significant environmental concerns and required coordination and approvals from a large number of regulatory agencies, including

- Section 404 permitting and NEPA coordination with the U.S. Army Corps of Engineers;
- Clean Water Act Section 402 compliance and coordination;
- Clean Water Act Section 401 compliance;
- Navigation clearance and Rivers and Harbors Act Section 10 compliance with the U.S. Coast Guard;
- National Marine Fisheries Service and U.S. Fish and Wildlife Service consultation under ESA Section 7 (multiple salmon species and other aquatic species in multiple waterways, multiple wildlife and plant species);
- Section 4(f) resources;
- Section 106 historic resources (many of the bridges were eligible or potentially eligible for listing on the National Register of Historic Places);
- Significant archaeological resources and the need for tribal input and coordination;
- Potential impacts to low-income and minority communities; and
- Significant visual impacts and concerns, including bridges located in a national scenic area.

The breadth and significance of the environmental issues created the potential for significant delay associated with securing many different permits for many different projects around the state from resource agencies with overlapping jurisdictions, as well as the potential for conflicting requirements and constraints from the different state and federal agencies with overlapping jurisdictions and different substantive and procedural expectations.

Unusually Large Scale of and/or Complex Project or Program

The bridges program required the repair and replacement of over 300 bridges in a 10-year period, more than ODOT had addressed in the previous 50 years. The program was further complicated by its geographic breadth; bridges were located throughout the state, spread across thousands of miles of Interstate and state highways. Bridges on the state's major freight routes required that the program be carefully coordinated and expedited in order to avoid significant adverse impacts to mobility, freight, congestion, and local economies during construction.

Expediting Strategies

ODOT set an aggressive schedule and committed the necessary resources to develop a new, expedited approach to program delivery to meet the objectives of the program. Specific expediting strategies addressed in this case study include

- Early commitment of construction funding;
- Programmatic or batched permitting;
- Performance standards; and
- Dispute-resolution process.

Early Commitment of Construction Funding

During the early planning phase of the bridges program the state legislature approved House Bill 2142, which authorized an increase in motor vehicle and trucking fees to provide full funding for the $1.3 billion bridge replacement and repair program. The key factor that made this an expediting tool was that this funding was approved while the program was in early planning and had not yet initiated preliminary engineering or NEPA. This demonstration of commitment helped to communicate that this program was real—it had passed the construction funding obstacle and had nearly eliminated the risk that time and resources spent to plan, design, and permit the program might be wasted. An early commitment of construction funds helped to garner the attention, time, will, and other commitments necessary to expedite decisions and delivery. Early funding indicated to all stakeholders that significant political support existed for the program and that it was a very high priority. This was an important factor in expediting the internal agency processes, in garnering the support and collaboration of other agencies, and in maintaining political support for the program.

Programmatic or Batched Permitting

By developing a single permit that can cover multiple, separate actions, it is possible to substantially expedite the permitting (and delivery) of a collection of projects. There are two basic approaches: (*a*) a batched permit or approval typically covers a set of specific actions that are identified in advance of the permit, and (*b*) a programmatic permit typically covers a collection of future actions that may or may not be specifically identified in advance of the permit. The actions covered by a programmatic permit are typically those that can meet the specific performance standards or other conditions specified in the permit.

ODOT worked with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service to develop a batched biological assessment and biological opinion to cover the bridges program. With over 300 bridges, this program included many different waterways and many species of threatened or endangered salmon, other fish, and wildlife. Preparing a biological assessment and biological opinion for each bridge, or even each set of bridges, would have been extremely costly and time consuming. The batched biological assessments and opinions covered multiple species for multiple bridge projects across multiple waterways around the state (*18*).

ODOT worked with the U.S. Army Corps of Engineers and state agencies to develop a regional general permit to address the program's permitting requirements under Section 404 and Section 401 of the Clean Water Act. Again, with over 300 bridges, this program included many different waterways and wetlands around the state. Some of the projects could qualify for nationwide permits, but many would require individual permits. Permitting each bridge or even each set of bridges individually would have required considerable time and effort. The regional general permit covered the permitting needs for nearly every relevant bridge replacement or repair project. The regional general permit was issued pursuant to the U.S. Army Corps of Engineers' authority under the Clean Water Act, and it included conditions for certification pursuant to Section 401 of the Clean Water Act and the Coastal Zone Management Act. The bridges program also secured a general authorization to cover state wetland and waterway permitting requirements (*19*).

The development of these programmatic and batched permits led to the development of Oregon's ecosystem-based mitigation and conservation banking program, which helped to expedite permitting and mitigation and provide greater environmental benefits than the traditional approach to mitigation (*20*).

Performance Standards

The programmatic and batched permits developed for the Oregon bridges program were based on a single set of permit conditions that included both prescriptive and performance standards. These standards were common across the regional general permit for Clean Water Act Section 404, the state wetland permit, and the ESA Section 7 batched biological opinion. In addition to the schedule advantages of batched and programmatic permits, the bridge program was further expedited, and enjoyed cost savings, as a result of the consistency in permit conditions across these three types of permits. Using outcome-based performance standards was key to making this possible. It allowed ODOT flexibility in bridge design and construction while assuring resource agencies of adequate environmental protection.

An outcome-based performance standard is essentially a term or condition included in a permit or approval that describes a specific measurable outcome from a project activity. For instance, rather than debating the best management practice that the permit will prescribe, agencies can agree that the proposed activity will not result in greater than X amount of impact (such as pollutant discharge). In many cases, the X that is being committed to is already fixed by regulation (e.g., this is the case for most water quality issues). In these instances, outcome-based performance standards are particularly useful at keeping permitting discussions on track. However, even when the outcome is not specifically prescribed by regulation, discussions with stakeholders are generally more productive when the parties discuss desired outcomes. Successful performance standard

development requires at least two key components. First, the performance standard outcome must be clearly measurable through an agreed-on method. Second, no performance standard should be agreed on without review by appropriate representatives from DOT design, construction, and maintenance staff.

One of the unique performance standards developed for the bridges permits was the fluvial performance standard. This standard created the flexibility to balance the sometimes competing desires of (*a*) minimizing bridge piers in the waterway (subject to Section 404 permitting requirements) and (*b*) minimizing bridge abutment–related fill that is within the floodway or floodplain but is above the ordinary high-water mark (and therefore not subject to Section 404 permitting requirements). For more information on this and other environmental performance standards, see the Oregon Bridge Delivery Partners website (*18, 19, 21*).

Dispute-Resolution Process

More than 30 of the bridges that were part of ODOT's statewide bridge repair and replacement program were located on federal lands administered by the U.S. Forest Service (USFS) or the Bureau of Land Management (BLM). ODOT had developed programmatic permits and a batched biological opinion to cover Clean Water Act Section 404 and 401 requirements, state wetland permit requirements, and ESA Section 7 consultation requirements for nearly all of the bridges requiring these approvals. However, the permitting and approval requirements associated with federal lands were not necessarily or completely covered by these programmatic permits. In order to address the unique NEPA and other approval requirements for bridges on USFS and BLM lands, ODOT, FHWA, BLM, and USFS developed an MOA. The MOA defined the approach that would be taken to ensure that ODOT's NEPA process and documentation would address the NEPA requirements of BLM and USFS and how other permitting requirements would be addressed. The MOA also defined each agency's role and responsibilities as either lead or cooperating agency, and it specifically outlined a process for elevating and resolving any disputes or issues that arose during the approval process.

Developed in close coordination with USFS and BLM, the dispute-resolution process specifically incorporated lessons learned by those agencies from their previous experience with dispute resolution. In particular, USFS and BLM had experienced problems with a previous dispute-resolution process that placed excessive emphasis on avoiding escalating disputes above the technical staff level. Technical staff on this earlier project had believed that escalating a dispute to senior staff would be perceived as a failure, and therefore they were very reluctant to elevate. This reluctance resulted in protracted attempts by technical staff to resolve disputes that probably could not be validly resolved at their level. Some disputes can only be resolved by senior staff or leadership with the authority to reinterpret policies or agency objectives or refine standard protocols and policies.

Lessons Learned

In the process of developing a new approach to implementing project delivery for the bridges program, ODOT and other agencies identified a number of keys to success in developing new approaches to project delivery, including expediting measures. They provide the following guidance:

- Identify and secure leadership support;
- Mobilize energy and commitment by jointly identifying problems and solutions with other divisions within the agency and with other agencies;
- Create a shared mission and pursue mutual benefits;
- Build on your and others' past successes;
- Initiate the new approach with a relatively autonomous group (e.g., a pilot program);
- Understand the relevant laws and regulations and their flexibility;
- Remove your agency's internal roadblocks to streamlining;
- Plan for and facilitate conflict and dispute resolution;
- Don't let the perfect be the enemy of the good;
- Formalize success through policy, systems, and organizational structure;
- Monitor results, evaluate, and improve; and
- Train, educate, and follow through (*20, 22, 23*).

Virginia DOT Early-Move Incentive Program

Summary

The Virginia DOT (VDOT), in cooperation with FHWA, expedited the relocation process for the Woodrow Wilson Bridge project by implementing a program that provided monetary incentives to encourage tenants to vacate their property quickly and allow subsequent construction activities to occur on schedule. Response to this program was largely positive. Tenants in 333 residential units in three apartment complexes were relocated on an aggressive schedule that allowed construction to begin earlier than otherwise possible. Delays in other preconstruction efforts were recovered, and the schedule was achieved in large part because this program gave tenants incentive payments if they were able to move out of their property within targeted time frames. Ultimately, VDOT paid approximately $1.2 million for incentive

payments, but saved an estimated $6 million by avoiding a projected 7-month delay to start construction.

Project Overview

The Woodrow Wilson Bridge project is the largest public works project in the mid-Atlantic region. This bridge carries the I-95/I-495 Capital Beltway and is one of seven crossings over the Potomac River in the Washington, D.C., metropolitan area. The 7.5-mile-long project replaced the previous bridge and reconstructed the four interchanges adjacent to the crossing that directly influence its operation. The project is sponsored by four agencies: FHWA, VDOT, the Maryland State Highway Administration, and the District of Columbia Department of Transportation.

There were three primary drivers for this project:

- Congestion relief;
- Safety improvements; and
- Correction of structural deficiencies.

The previous Woodrow Wilson Bridge opened in 1961 and was designed to carry 75,000 vehicles per day. By 2000, nearly 200,000 vehicles were using the bridge, with nearly 300,000 vehicles projected by 2020. The bridge's six lanes narrowed the eight-lane Capital Beltway and had become a severe bottleneck that created 7 hours of congestion on the average weekday and frequently created traffic backups that spanned several miles. Additionally, the previous structure—a drawbridge with only 50 feet of vertical navigation clearance—had to be raised frequently for river traffic, which exacerbated congestion and traffic backups.

The congestion problems, coupled with substandard highway design, lead to safety problems on and around the original bridge. The merging from the eight-lane Capital Beltway to the six lanes on the original bridge created traffic conflicts, which were worsened by very narrow shoulders. Furthermore, the drawbridge, which was frequently raised, added potential conflicts as it introduced a stop that was unexpected by some drivers. Overall, the accident rate on and around the bridge was twice that of similar highways in Maryland and Virginia.

Vibrations from the increased traffic volume had caused the bridge supports to deteriorate, compromising the structural integrity of the original bridge. Engineers estimated that if the bridge did not receive significant repairs or replacement by 2004, it would require weight restrictions (see the timeline in Table 4.11).

After several years of planning studies and alternatives evaluation, the preferred alternative was identified in 1996. This design included two separate six-lane bridges with a pedestrian–bicycle path to connect trails on both sides of the crossing. The new facility includes the ability to add two HOV–transit lanes or a rail transit system if connecting facilities are constructed.

Table 4.11. Virginia Dot Early-Move Incentive Program Timeline

1987	A study is initiated by the federal government, Virginia, Maryland, and the District of Columbia.
Early 1990s	Traditional project selection process fails in face of opposition from local jurisdictions.
1992	Inclusive project development effort is launched. A multijurisdictional coordination committee is created, with nine of 14 members representing local jurisdictions.
1992–1996	Panel studies are conducted with extensive public input.
1996	A 12-lane facility and reconstruction of four adjacent interchanges is recommended.
1997	FEIS and ROD are issued.
2000	Final supplemental EIS and ROD are issued.
2000	Construction begins with river dredging.
2001	Bridge foundation construction begins, as well as some work on Maryland interchange improvements.
2003	Bridge superstructure construction begins with work on Virginia and Maryland tie-ins.
2006	First new bridge is completed; traffic is rerouted to this bridge, and demolition of the old bridge begins.
2008	Second new bridge is completed, along with the majority of the adjacent three interchanges.
2013	Fourth interchange is expected to be completed.

Project Constraint

Relocation Process Delays Construction

As with most projects of this magnitude, the Woodrow Wilson Bridge project encountered many potential causes of delay. The hurdle highlighted for this case study was the need to rapidly relocate the tenants of 333 units in three apartment complexes located in the area where VDOT would construct the Virginia landside connections to the new bridges. The project leaders hoped to relocate these tenants quickly as relocation was one of the final steps needed before construction could begin. A variety of minor delays that preceded property acquisition and relocation added more pressure for quick completion in order to recover the schedule and begin construction on time. What was originally planned to be a 15-month relocation process needed to be completed in just 8 months to avoid delaying the start of construction.

Expediting Strategy

Incentive Payments to Expedite Relocations

The VDOT right-of-way team knew that relocating 333 apartment units in 8 months could not be accomplished simply by implementing traditional approaches to the relocation process. Fortunately, FHWA, AASHTO, and NCHRP had recently completed a study of transportation agencies in England, Germany, Norway, and the Netherlands to review best practices for property acquisition and utility relocation. This study looked at how transportation agencies in these countries addressed the needs of property owners affected by highway projects, identified some innovative techniques for compensating owners, and made recommendations for U.S. applications. One of the innovative techniques identified from this study was the use of incentive payments to encourage property owners and tenants to more quickly come to agreement on arrangements for relocation.

Based on information from this study, VDOT introduced the early-move incentive program, which stated that any tenant who moved within 30 days of receiving a replacement housing payment would receive a $4,000 incentive. Residents able to move between 31 and 60 days of receiving a replacement housing payment would receive a $2,000 incentive. These payments were in addition to the relocation assistance benefits provided to displaced tenants.

Tenants responded positively to the early-move incentive program. Tenants in 262 units moved within 30 days of receiving the replacement housing payment and were given the $4,000 incentive payment, and tenants in 15 units moved within 60 days and received the $2,000 payment. Ultimately, all tenants were successfully relocated within the 8-month time frame, allowing construction of the Virginia bridge connections to commence on schedule. Overall, VDOT paid approximately $1.2 million to displaced tenants via the early-move incentive program. However, if the relocation process had required the originally planned 15 months, this 7-month delay to construction would have cost VDOT $6 million.

Lessons Learned

The early-move incentive program was a nearly unqualified success and is a good example of implementing techniques learned from FHWA's International Technology Scanning Program. Several important factors contributed to this success. Techniques employed by VDOT staff helped to increase the response rate from tenants to this program, and several characteristics of the project helped to make the use of incentive payments worthwhile. While incentive payments can be a helpful strategy for expediting the relocation process, they are not always cost-effective.

Once the incentive program was approved internally by VDOT and FHWA, the right-of-way team made sure all tenants were quickly made aware of the program by going door-to-door and explaining to each tenant the relocation process and how the incentive payments would work. Performing this outreach face-to-face immediately at the inception of the program helped to maximize its effectiveness at compressing the relocation schedule.

Accelerating the relocation process added staffing demands. Immediately after the issuance of the replacement housing payments, the relocation team received a strong response from tenants wanting to make sure they moved in time to meet the requirements of the incentive program. This required additional staff to handle tenant inquiries and process the paperwork during the first several weeks of the program. Additionally, the compressed timeline for moving tenants from the apartment buildings required additional staff to coordinate the moving process with property managers. The high-rise apartment building had only two elevators, and one needed to be available at all times for day-to-day use. This left just one elevator dedicated for tenants moving out, a situation that required project staff to help manage logistics. Overall, more project staff were required for the relocation process because of the incentive program, but the shorter schedule meant these staff were needed for less duration.

A few important characteristics of this project helped make the early-move incentive program successful. First, the relocation process became the last task required before construction of the Virginia portion of the project could begin, meaning that any delay to the relocation process would delay construction and increase project cost accordingly. The risk of increasing construction cost made the incentive payments a cost-effective option. Second, the scheduled time frame for relocations became shortened to nearly half the time that would typically be allotted for the task, meaning that a business as usual approach would not work. Finally, the large number of tenants to be replaced also raised the possibilities of delay that can arise when attempting to relocate a large number of households rapidly.

VDOT has recently used incentive payments on another project that is making improvements to the I-66 interchange in Gainesville. In this case, VDOT offered $100,000 incentives to 42 businesses if they were able to relocate within 30 days of the program's inception, and $50,000 if they moved in 31 to 60 days. Business relocations entail many different considerations than residential relocations and can often be more complex. However, these incentives ultimately proved helpful in accelerating the relocation of 41 of the 42 businesses, which was enough to advance the utility relocation process (previously expected to delay the project) by an estimated 18 months. This delay would have escalated construction cost by approximately $10 to $15 million.

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CHAPTER 5

Conclusions

Transportation agencies are seeking to do more with less. Funding for new capacity and even maintenance and preservation projects has not kept pace with growing needs. As transportation agencies seek to find efficiencies and to expedite how they address these needs, public scrutiny is becoming more intense, decisions are becoming more difficult, and regulatory compliance is becoming more involved. These conditions pose significant challenges for a transportation sector attempting to deliver projects with greater efficiency and speed.

Research into the causes of project delay and methods of expediting project delivery began in earnest in the 1990s and has continued to the present, particularly in the transportation sector. The number of transportation-related directives, studies, and other publications devoted to this topic is a testament to this sector's concern about the effects of project delay and high interest in delivering projects more efficiently. This interest is especially telling when compared with other infrastructure sectors, such as energy or water supply, that appear to have devoted considerably less attention to this topic. Research on expediting transportation projects has developed and matured rapidly, and in a relatively short time has transitioned from exploring broad principles of good practices to identifying specific types and causes of delay and techniques for addressing them.

The research in this report reflects a growing interest in the specific tools and techniques—or strategies, as they are generally referred to in this report—for addressing constraints to expedited project delivery. Much has already been written about the causes of project delay, the general principles of and approaches for expediting project delivery, and major landmark projects and programs that have successfully avoided delay and/or expedited delivery. This study sought to provide more information and evaluation of the specific strategies used to overcome the constraints associated with specific delivery tasks. It was evident from the literature search that this was an area of project expediting that was not well covered in the existing research. There were detailed case studies of several major landmark projects, and lists and short descriptions of expediting strategies, but detailed information on specific strategies has been limited. This study aimed to make substantial progress toward filling that gap.

Another objective of this study was to present the information so that it will be accessible and useful to practitioners. This objective drove the focus of the research and at least part of the documentation of the findings in this report. However, this report only partially accomplishes this objective. There is too much information in this report for it to be considered highly accessible. Accessibility and utility to practitioners will be accomplished largely through the subsequent task of uploading key information (in a form that prioritizes ease of access and use) about the strategies and the constraints to the TRB's Transportation for Communities: Advancing Projects through Partnerships (TCAPP) website, created to enhance collaboration in transportation decision making (*1*). This website is being continually expanded to include relevant information generated by the Capacity program research conducted through SHRP 2. Information from this study will be added in late 2010 or early 2011.

While this research has highlighted some clear themes for what the tools and strategies can accomplish and has identified specific strategies that have helped to expedite project delivery, it has also emphasized that the transferability of different strategies can depend on context, and that some strategies are more transferable than others. Each strategy also carries its own potential costs (as well as cost savings), risks, potential for time savings, and other benefits. These factors, including potential transferability and applicability issues, are included in the analysis of each strategy. While projects may share many traits and appear to face similar challenges, there are variables that can be important in determining the potential success of a given strategy. Accordingly, before choosing to apply a particular strategy, it is important to consider the specific constraints that need to be addressed, the context of the

project (organizational, institutional, and political, and so forth), and other factors that made that strategy effective in previous projects. This report provides that information to help project and program managers make these determinations and adapt the appropriate expediting strategies to their own projects.

Recommendations for Further Research

Through the course of conducting the interviews, literature search, and other tasks in this study, several recommendations for further research have emerged. Some are directly related to the topic of this research project, while others are generally related to expediting. Recommendations include

- Evaluate the reasons that the mean and median durations for completing transportation EISs are consistently and notably longer, and in some cases substantially longer, than the durations in any other sector. This difference is evident from analyses of the EIS databases from multiple federal agencies including FHWA, but explanations of this difference are only speculative (*2*). Increased understanding of why there is such a substantial difference could help to identify the particular types of expediting strategies that would provide the greatest reduction in delivery time for transportation projects and programs.
- Identify and evaluate additional expediting strategies not included in this report. This study was not intended to compile or evaluate an exhaustive list of expediting strategies. Other potential strategies were identified but were not included in this study due to a lack of information, inability to locate parties that implemented the strategy, or the timing limitations of the study. For example, predictive modeling for natural resource issues has shown some potential, but it was not included in the report due to a lack of examples in which it had clearly helped to expedite delivery.
- Further evaluate why certain strategies have been successful in some situations and have failed in others. This could include programmatic permits and decision councils, both of which have provided significant expediting benefits in some situations and have failed in others. This study evaluated transferability and applicability, but more in-depth analysis of some of the strategies that have had an especially wide range of results could provide further understanding of how to reduce their risks and improve success.
- Further evaluate why some strategies with proven success are not widely used. Through this study, strategies have been identified that implementing agencies reported to be highly successful, but these strategies have not been broadly implemented.
- Regularly update and maintain the list of successful expediting strategies and case studies, including descriptions and analyses of the strategies. As new projects and programs successfully expedite delivery, the lessons learned could be used to add to the information provided in this report and be made available to practitioners through the TCAPP website.

In addition to research, there would be benefit from selectively making other existing information on expediting project delivery (contained in other reports, papers, agency guidelines, and so forth) more available and usable to practitioners. Much of it is embedded in reports that are not readily usable or accessible. The utility of this information would be increased if it were made available on the web and presented in more user-friendly formats.

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Related SHRP 2 Research

A Framework for Collaborative Decision Making on Additions to Highway Capacity (C01)

Performance Measurement Framework for Highway Capacity Decision Making (C02)

An Ecological Approach to Integrating Conservation and Highway Planning (C06)