Effective Project Management for NEPA

Prepared for:

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Standing Committee on the Environment

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Acknowledgement

Disclaimer

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List of Acronyms

ADT	Average Daily Traffic
AASHTO	American Association of State highway and Transportation Officials
Caltrans	California Department of Transportation Department
CAP	Communicating all Processes (KYTC)
CART	Communication Access Realtime Translation
CDOT	Colorado Department of Transportation
CE	Categorical Exclusion
CEDAR	Comprehensive Environmental Data and Reporting system
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CETAS	Collaborative Environmental and Transportation Agreement for Streamlining (Oregon DOT)
CEVP	Cost Estimation Validation Process
CFR	Code of Federal Regulations
COE	US Army Corps of Engineers
COTS	Commercial Off the Shelf
CRA	Cost Risk Assessment
CSS	Context Sensitive Solutions
CTS	Comment Tracking System
CWA	Clean Water Act
DAG	Design Advisory Group
DEIS	Draft Environmental Impact Statement
DLG	Digital Line Graph
DOTD	Department of Transportation and Development (Louisiana)
DOTs	Departments of Transportation
EA	Environmental Assessment
ECB	Environmental Competency Building
ECM	Enterprise Content Management (WSDOT)
ECOPAC	Environmental Commitments and Obligations Package (NYSDOT)
ECR	Environmental Commitments Record (Caltrans)
EIS	Environmental Impact Statement
EM	Environmental Monitor Toolkit (MDSHA)

EMS	Environmental Management System
EO	Executive Order
EPA	US Environmental Protection Agency
EPD	Environmental Programs Division (MDSHA)
EPIC	Environmental Permits, Issues and Commitments (TxDOT)
ESA	Endangered Species Act
EST	Environmental Screening Tool
ETDM	Efficient Transportation Decision-Making Process (FDOT)
ETRACK	NYSDOT Tracking Database
ETS	Environmental Tracking System
FDOT	Florida Department of Transportation
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
GIS	Geographic Information System
HOV	High-Occupancy Vehicle
HOT	High-Occupancy/Toll
ITD	Idaho Transportation Department
iPM	Integrated Project Management (VDOT)
KYTC	Kentucky Transportation Cabinet
LEDPA	Least Environmentally Damaging Practicable Alternative
LOS	Level of Service
MDE	Maryland Department of Environment
MDOT	Michigan Department of Transportation
MDSHA	Maryland State Highway Administration
MMRR	Mitigation Monitoring and Reporting Record (Caltrans)
Mn/DOT	Minnesota Department of Transportation
MoDOT	Missouri Department of Transportation
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
NCDOT	North Carolina Department of Transportation
NCHRP	National Cooperative Highway Research Program
NDOT	Nevada Department of Transportation

NEPA	National Environmental Policy Act
NHI	National Highway Institute
NHPA	National Historic Preservation Act
NJDOT	New Jersey Department of Transportation
NMDOT	New Mexico Department of Transportation
NPDES	National Pollutant Discharge Elimination System
NYDOT	New York State Department of Transportation
ODOT	Ohio Department of Transportation
ODOT	Oregon Department of Transportation
PAM	Permits, Agreements, and Mitigation (Caltrans)
PDCA	Plan-Do-Check-Act
PD & E	Project Development and Environmental Manual
PDF	Portable Document Format
PDP	Project Development Process
PEAR	Preliminary Environmental Analysis Report (Caltrans)
PEL	Planning and Environmental Linkage
PennDOT	Pennsylvania Department of Transportation
PM	Project Management/Project Manager
PMP	Project Management Plan
PMRS	Project Management and Reporting System (WSDOT)
PPMS	Program Project Management System (NMDOT)
PRSM	Project Resourcing and Schedule Management (Caltrans)
PS&E	Plans, Specifications, and Estimates
PSR	Project Study Report
QA/QC	Quality Assurance/Quality Control
QFD	Quality Function Deployment
QP	Quality Planning
RE	Resident Engineer
ReTRAC	Reno Transportation Rail Access Corridor
ROD	Record of Decision
ROW	Right-of-Way
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SCOE	Standing Committee on the Environment (AASHTO)
SDDOT	South Dakota Department of Transportation

SHOPP	State Highway Operation and Protection Program (Caltrans)
SMART	Specific, Measurable, Agreed To, Realistic, and Time-Constrained Performance Standards
SQL	Standard Query Language
STEP UP	Strategic Transportation, Environmental and Planning Process for Urbanizing Places (Colorado DOT)
STIP	Statewide Transportation Improvement Program
STRAHNET	Strategic Highway Network
TDOT	Tennessee Department of Transportation
TEA-21	Transportation Equity Act for the 21st Century
TIP	Transportation Improvement Plan
TPR	Transportation Planning Region
TxDOT	Texas Department of Transportation
U.S.C.	United States Code
USCG	US Coast Guard
USFWS	US Fish and Wildlife Service
USGS	United States Geological Survey
VDOT	Virginia Department of Transportation
VDRPT	Virginia Department of Rail and Public Transportation
VE	Value Engineering
WSDOT	Washington State Department of Transportation

1 Introduction

The objective of the National Cooperative Highway Research Program (NCHRP) Project 25-25(27) "Effective Project Management for NEPA" (*National Environmental Policy Act[1]*) is to develop guidance on effective project management practices to facilitate the NEPA project development process. Sound and effective project management is the key to the successful delivery of a state's transportation program. However, it is very difficult for a project manager to understand fully the issues and concerns related to every environmental factor addressed during the NEPA process, and little guidance is available that addresses the nexus of project management and NEPA management.

Project managers need more information on tools, tips and approaches used successfully to facilitate the NEPA project development process. Our research approach to NCHRP 25-25(27) involved a literature and internet search, a web-based survey of state Departments of Transportation (DOTs) and Federal Highway (FHWA) division offices, followed by in-depth telephone interviews with state DOTs and FHWA division environmental managers, engineering project managers, and planners involved at various phases of project development and program management.

In November 2007, a review of initial findings with the panel and discussion about the most appropriate form for the guidance, the panel decided on a "best of both" approach, organizing the manual both around key decision points in the NEPA process and project management principles.

1.1 Study Overview and Purpose

NCHRP 25-25(27) seeks to apply effective project management to the NEPA process to deal with uncertainty and risks, avoid delays, and prevent cost overruns. The project was designed to offer assistance to state DOT Project Managers to inject efficiencies into the key phases of the NEPA process to accurately scope, schedule and cost the environmental component of the project development process to minimize delays, contention, and cost overruns.

This study is not intended to provide comprehensive guidance on conducting all aspects of the NEPA process and the reader is referred to the full text of the regulation, guidance, and other sources, many of which are provided with hyperlinks in the text. This study focused on those areas that project managers interviewed for this project identified as the most challenging or where there are the most often overlooked opportunities for injecting efficiencies into the NEPA process. Key areas include the linking planning and NEPA process, scoping, development of purpose and need, identification and analysis of a "reasonable range of alternatives", and overall project management skills such as managing project schedules, budget and risk management.

1.2 Literature Search

The purpose of the literature review was to identify, compile and document readily available reports, publications, tools, guidance, training programs, and successful practices that are available to state DOT project managers who work in the NEPA context. Few agencies have guidance for project management techniques but many DOTs now have a guidance manual for conducting the NEPA analyses and related components.

Our initial search focused on review of current literature, and DOT and agency websites, particularly on the following topics.

- Concurrent elements in project development
- Model document/process management systems
- Interest-based negotiation
- Coordination and consensus-building
- Dispute resolution
- Performance Management
- Integration of environmental decisions in project management to expedite project delivery and ensure environmental compliance

- Scheduling, streamlining processes, risk management of daily activities
- Performance measures and goal-oriented management
- Public Involvement
- Linking planning and NEPA
- Risk management
- Change management
- "Intelligent risk taking" (avoiding over-documentation)

The remainder of this report and the guidance incorporate the results of the literature review. A select annotated bibliography is included in Appendix A – Annotated Bibliography.

1.3 Web-based Survey and Findings

An electronic survey was developed with input from the NCHRP 25-25(27) panel and approved for distribution to Environmental Managers at all 50 state DOTs. At the request of the panel, we also sent the survey to FHWA since they play a key role in the management of Federal-aid highway projects. The survey is provided in Appendix B – Web-based Survey and Survey Respondents. We designed the survey to make it easy for the recipients to click a button to quickly respond to questions and facilitate gathering of basic information on perceptions and practices in the management of NEPA projects. Questions asked for the interviewee's views on the difficulty or ease of managing the key

decision points in the NEPA process, staffing and organizational factors that cause project delays, and the training and project management tools they need to better manage the NEPA process.

In general, the survey results indicated that most respondents find managing the NEPA process moderately difficult. The survey also revealed some important information about practitioners' major issues relevant to the NEPA process. The concerns were generally consistent between the DOTs and the FHWA, but opinions differed between the agencies in some instances. The agencies reported that the following are the most difficult:

> **DOT NEPA Project Managers Think the Most Difficult Parts of the NEPA Process Are:**
>
> Mitigation Planning - 54%
>
> Permits and Approvals - 62%
>
> Mid-project change in personnel at the resource agencies and accompanying changes in interpretations of environmental regulations – 64%
>
> Request for difficult, impossible or unreasonable level of detail DOTs – 79%

- Development of purpose and need (DOTs – 28%; FHWA – 62%)*

- Alternatives development and screening (DOTs - 43%; FHWA - 75%)

- Mitigation planning (DOTs – 54%; FHWA - 30%)

- Permits and approvals (DOTs - 62%; FHWA - 30%)

- Inadequate number of DOT environmental staff (DOTs – 33%; FHWA – 62%)

- Mid-project change in personnel at the resource agencies and accompanying changes in interpretations of environmental regulations (DOTs – 64%; FHWA – 46%)

- Project funding (DOTs – 49%; FHWA – 77%)

- Request for difficult, impossible or unreasonable level of detail (DOTs – 79%; FHWA – 40%)

- Change in project scope requested by local agencies and the public (DOTs – 36%; FHWA 60%)

*Percentage based on a rating of difficult or very difficult
  Note: Not all respondents answered all questions.

In all, we received 50 responses to the online survey – 37 from the DOTs and 13 from FHWA division offices. In a few instances, we received multiple responses from different staff within the same agency. Although it was not the intent of the survey to provide statistically valid results, the response rate was quite good for a survey of this nature.

The survey respondents were professionally diverse and representative of varied roles in managing the NEPA process. Some of those represented include environmental planners, environmental program managers, engineering managers, and environmental specialists. Appendix B – Web-based Survey and Survey Respondents provides a list of all the web-based survey respondents.

Exhibit 1. Geographic Distribution of In-Depth Telephone Interview Participants

1.4 Telephone Interviews

Another goal of the web-based survey was to identify practitioners willing to participate in a follow-up telephone interview. We developed the interview questions to focus on those issues of greatest concern identified by the survey respondents, to add more in-depth information and perspective, and to identify and document successful practices and lessons learned in integrating NEPA management and project management. The general interview questions are provided in Appendix C – Telephone Interview Questions and Participants, but were expanded on an interview-by-interview basis based on the individual respondent's answers.
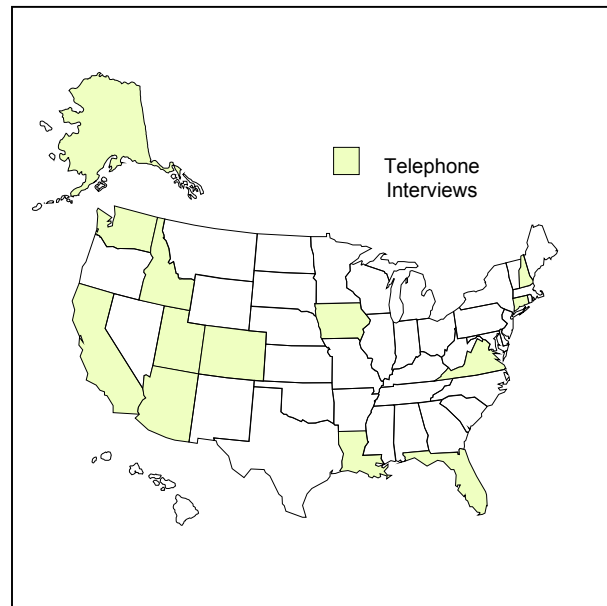
In all, seven FHWA experts and nine DOT experts participated in the telephone interviews. Exhibit 1. Geographic Distribution of In-Depth Telephone Interview

Participants, shows the distribution of in-depth telephone interview participant and a list of the interview participants is provided in Appendix C - Telephone Interview Survey and Participants. Although the interviewees were less geographically diverse than those that responded to the web-based survey, they are professionally diverse and representative of varied roles in the NEPA process.

Interview Focus

The first series of interview questions were established to identify those phases of the project development practice related to the NEPA process that practitioners find most challenging. The questions were open ended to allow respondents to elaborate on the key issues of concern identified in the web-based survey such as developing and screening alternatives, impact analysis, mitigation planning, and obtaining permits and other approvals.

The second series of questions focused on project management challenges such as collaborative decision-making with the resource agencies, risk management including scope, cost, and schedule management, and dispute resolution. Finally, respondents were asked to provide recommendations on tools, guidance and training that they believe would be most helpful in managing the NEPA process.

The next section summarizes the responses for each series of questions and the responses were used in the development of the remainder of this guidance document.

1.5 Concerns Related to Managing NEPA Projects

NEPA management includes those decisions made at key phases in the NEPA process beginning in long-range planning.

Linking Planning and NEPA

Most agencies understand the potential benefits; however, implementation of a linked planning and NEPA process remains a challenge. One respondent said the DOT did not find the process effective and found it more cost efficient to move directly into the NEPA process because the long-range planning process is not needed to identify the current transportation problems.

In many states, the long-range planning office is located separately from the rest of the project development team with little communication between the two groups. Only five of the 50 project managers surveyed said they are involved in the long-range planning process.

Many interviewees expressed some doubt on whether or not the decisions made in a 20-year plan will withstand the test of time due to changes in political leadership, public opinion, and regulatory requirements. For the same reason, resource agencies and the public may be reluctant to devote time to participating in the planning process, a barrier that remains difficult to overcome.

One interviewee indicated they only link planning and NEPA to *Section 404 of the Clean Water Act* (CWA), to reach a decision on the Least Environmentally Damaging Practical Alternative (LEDPA) and integrate US Army Corps of Engineers (USACE) permit requirements for impacts to wetlands. Many DOTs said they are in the process of developing guidance for linking planning and NEPA processes, but currently, the NEPA/404 merger process is the extent of linking planning and NEPA for most agencies. Many interviewees requested guidance on how to implement the linking process.

Whether or not they have a formal process for linking planning and NEPA, many DOTs do incorporate some elements such as identifying purpose and need, logical termini, and conducting an environmental fatal flaw analysis in planning, which then provides a starting point for the NEPA study. Louisiana Department of Transportation Development (DOTD) develops the purpose and need and assesses the feasibility of alternatives in the long-range plan and rolls the information into the NEPA study; however, they are careful to not cross the "cloudy boundary" and make the final decision on the preferred alternative in planning. Other DOTs are in the process of developing guidance to meet *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU)[2] requirements to provide strategies that protect and enhance the environment, and discuss potential environmental mitigation activities in the long-range plan.

Scoping

Nearly half of the survey respondents said that scoping, including coordination with other agencies, local governments, and conducting public meetings, is difficult. However, the majority of the survey respondents said the project manager is not involved in the scoping process.

One DOT felt that scoping is done too early, before there is enough information to adequately define the project for the public. Another DOT said that getting locals and some DOT staff to see the value in the process is a challenge. For most, however, the concerns related to scoping focused on the SAFETEA-LU requirements to design the scoping process to include participating agencies with an interest in the project (for environmental impact statements (EISs)).

The Idaho Transportation Department (ITD) provides an example of a state where interviewees spoke up about the value of the scoping process. The agency uses scoping to confirm that the need for the project identified in planning is still the same and in a second meeting with the public, they get ideas on possible alternatives. The agency uses a facilitator for the scoping meetings that is very good at interpreting both the public and engineering needs. ITD has found this to be very valuable and helpful in reducing public conflict.   Interviewees reported that overall, it speeds up the process and helps the DOT and FHWA come to decisions that everyone can live with.

Purpose and Need

Developing the purpose and need statement is a common concern. A number of interviewees said that resource agencies request that the purpose and need statement include mitigation commitments to address existing conditions of the resource or to "fix the sins of the past." "It is not a simple process to get federal agencies to agree on the level of analysis needed and the process has choked because there is not a meeting of the minds." This affects not only the range of alternatives to be considered but also the determination of how well the alternatives meet the purpose and need. The USACE frequently asks for more detail in the purpose and need statement to make decisions on the LEDPA under the Section 404/NEPA merger process.

SAFETEA-LU requirements to get public and agency input on the purpose and need presents a challenge for many agencies. Going to the public too early with an incomplete purpose and need forces the DOT to act too soon, making it difficult to respond to public comments. "The public already complains that the DOT and FHWA don't listen. They do listen but sometimes they can't give them what they want." To

address this problem, Washington State DOT (WSDOT) prepares a separate report to respond to public comments on purpose and need.

Several agencies noted that when planners develop the purpose and need and alternatives for the long-range plan, there is a disconnect with project development because the concepts developed in planning may not necessarily be correct for the project. DOTs have found it challenging to link planning and NEPA, and planning departments are often isolated from project development. Virginia DOT (VDOT) tries to surmount this challenge in the planning process by using the information coming from the local governments, metropolitan planning organization (MPOs), and scoping to develop a simple purpose and need statement to describe the problem that exists and how the problem will manifest itself in the future if not corrected.   To do this, VDOT has a template that they developed with FHWA for use on all projects.

Some project managers think that purpose and need statements have become too long and do not align with NEPA training and guidance. One DOT noted that the guidance says an environmental assessment (EA) should be 30 pages long but the consultant has taken 6 months to write the purpose and need and the EA is now 100 pages long. The length of the purpose and need statement as well as the size of NEPA documents overall is a concern for agencies across the country. Nearly all agencies expressed a need for guidance on how to focus the studies on the issues that are truly important to making the decision.

Developing and Screening Alternatives

One of the most challenging aspects of the NEPA process for many project managers is developing a reasonable range of alternatives. General issues include:

- Limiting the development of alternatives to a reasonable range

- Amount of detail needed to compare and screen alternatives

- Alternatives screened in the planning process don't satisfy NEPA requirements and MPOs come to the table having already determined the final solution

- Insufficient detail of the goals and objectives from the planning process or a poorly developed purpose and need statement results in the development of too many, often unreasonable, alternatives—a process that is usually costly and time consuming

The way agencies develop alternatives varies considerably. Some DOTs identify several alternatives at the start of project development. Others brainstorm ideas with relevant resource agencies and local governments. A few DOTs seek consensus with the other agencies at this point.   Louisiana DOTD goes into scoping with geographic information system (GIS) information and asks the public to draw a line with a marker on a blank screen of suggested alternatives. Only after public input does the DOT apply engineering data. VDOT links the alternatives with the purpose and need and work to keep the number of alternatives limited to three or four, otherwise they tend to become duplicative; VDOT's objective in developing alternatives is to identify solutions that will work and to avoid producing additional alternatives just to demonstrate the preferred alternative minimizes impacts.

Performance Measures

Very few agencies responded that they use performance measures to screen alternatives, although most use Level of Service (LOS) as one criterion. Many of them

are reluctant to use performance measures because they feel it is difficult to defend the more subjective, qualitative measures, especially when they get conflicting opinions from the resource agencies.

However, Utah DOT uses measures of effectiveness such as:

- Cost
- The ability of the alternative to meet purpose and need
- Environmental impacts – e.g., wetlands, 4(f), and right-of-way (ROW)
- Reduction in congestion and delay
- Consistency with local plans

ITD, like many DOTs, quantify impacts, where feasible, to compare alternatives. For things such as visual impacts or impacts to environmental justice communities, ITD uses descriptors to do a relative comparison. In a group setting with citizens, businesses, and local government staff, the DOT gets an understanding of whether particular resource impacts will be a major issue or if the impacts so minor or irrelevant that they can be eliminated from further study. The agency does not necessarily do environmental screening for all resources; it depends on the issue. For example, archeology can be very expensive to do detailed surveys so the DOT limits surveys to the last two or three alternatives if needed to differentiate the alternatives or identify a fatal flaw.

Impact Analysis

Overwhelmingly, the major issue for most DOT and resource agencies is reaching agreement on a methodology for assessing impacts. Alabama DOT succinctly stated, "In general, the DOT wants to do less and the (resource) agencies want more." Many DOTs feel the process is too subjective and is dependant on how individual resource agency staff interpret the regulations. Further, requirements can change with staff turnover. To address these concerns, DOTs are beginning to get agreements in writing, recording and trying to solidify decisions to lessen the chance of reconsideration under a different perspective, when agency staff turnover occurs.

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Evaluating resources that have established standards, such as wetlands and air quality, is relatively straight forward and several agencies expressed a desire for a similar standardized, predictable process for analyzing other resources. Florida DOT said they have documented methodologies and state requirements in the Project Development and Environment Manual (PD&E) and this has helped with consistency. The Kentucky Transportation Cabinet (KYTC) provides standard guidance in the consultant's scope of work and only pay the consultant when the analysis meets their requirements.

Agencies are particularly interested in guidance related to the following emerging issues:

- Climate change and green house gases
- Mobile source air toxics
- Tolling

Indirect and Cumulative Impacts

As discussed above, one of the greatest challenges in conducting the NEPA analysis is the lack of a consistent impact assessment methodology. Determining spatial and temporal boundaries for the cumulative impact analysis compounds the issue. Expressing the sentiments of many interviewees, one said that the "resource agencies are all over the place and indirect and cumulative impact analyses are a moving target." The analysis and methodologies are often different for every project. Predicting future growth and land use changes is especially difficult.

Mitigation Planning and Permitting

The typical level of design most DOTs complete for NEPA studies is approximately 30 percent. As such, proposed mitigation plans are presented as concepts and do not have the level of specificity to identify mitigation details. Moreover, due to the lack of funding for final design or construction, it may be several years before the DOT can provide the details. This presents a problem for resource agencies that require impact analyses with a greater level of detail in order to determine appropriate mitigation and approval of permits. Regulatory agencies are often caught between their regulatory requirements and the limitations of design the DOT can complete for a NEPA study or design stage. DOTs frequently cited mitigation for impacts to wetlands and historic resources as especially difficult. In some states, more than one agency has jurisdiction over a particular resource, and each agency has different requirements for mitigation and permitting. In other instances, different districts of the same agency apply the regulations differently and the inconsistency makes it difficult for all stakeholders to reach agreement on the appropriate mitigation.

Several DOTs are taking steps to address these issues with regular interagency coordination meetings, completion of mitigation in advance of construction, establishment of liaisons to represent multiple districts in work with the DOT, use of programmatic agreements, development or purchase of mitigation banks, or purchase of conservation easements. For example, ITD has agreements with at least six Federal and state agencies on methodologies for impact assessments, the types of projects that need to submit, and a timeframe, usually 30 days, for the agency to respond. Agencies must also attend a meeting in the field. This streamlines the mitigation and permitting process and the DOT often gets better, cheaper, and more practical ideas for mitigation. The agency also uses video conferencing to make it easier to get the resource agencies together. It now takes only about one month to get a Section 404 permit at preliminary design. Several states such as WSDOT, ITD and VDOT have similarly found that early and consistent coordination and building good relationships with the resource agencies, as well as ensuring follow-through on mitigation commitments in construction makes mitigation planning and permitting much easier and faster.

Regulatory Changes

Implementing SAFETEA-LU requirements, particularly public and agency involvement in development of the purpose and need, is a particular concern for many of the DOTs and they would like additional guidance on how to implement the new processes required under sections 6002 and 6004. On the other hand, the ability to use Section 4(f) *de minimis* is saving time on obtaining Section 4(f) clearances.[3]

Opportunity for Concurrent Processes

Preliminary design may show grade, toe of slopes and profile but does not provide enough detail to identify the impacts of the final design but only a few DOTs said they do

additional design to avoid or minimize impacts, particularly to Section 4(f) resources and wetlands. As discussed earlier, this is problematic for resource agencies that need a higher level of design detail to issue permits or other approvals. None of the respondents reported using design variances to avoid or minimize environmental impacts. Many DOTs said they try to do as little design as possible during NEPA studies to retain flexibility and minimize costs of design changes later in the process.

Public Involvement

Although more than half of the respondents said that public involvement is moderately difficult, further questioning in the telephone interviews revealed few specifics. However, as noted in several other sections of this report, implementing SAFETEA-LU requirements to provide the public the opportunity for involvement during the development of the purpose and need statement and the identification of the range of alternatives is a concern for many DOTs. For others this has not been an issue because they already include public input at scoping. Caltrans, for example, does not have guidance specific to this issue but their Standard Environmental Reference manual weaves together Section 6002 with NEPA and the California Environmental Quality Act (CEQA)[4].

One DOT engages the public at the planning phase followed by additional informal meetings such as open houses at the beginning of the project to get public input. When the alternatives are developed, they go back to the public to get their input again. The agency holds numerous public meetings and responds to all public comments in their documents. The agency feels that when members of the public take the time to comment, it is important to give them a good response and not a canned answer. However, the DOT also noted that it is often a challenge to get the public to attend meetings and stay engaged.

1.6 Concerns Related to Project Management

Interview questions related to project management included the use of risk management to control the project scope, schedule and budget as well as staffing a project and ensuring smooth working relationships.

Risk Management

Very few DOTs said they have a formal risk management process, particularly as it relates to managing the scope, schedule and budget for the NEPA process. FHWA is rarely involved in scope, schedule, and budget management but one source felt that if FHWA were as accountable as the DOT for the budget and schedule, FHWA's reviews and comments on major documents would be more efficient and constructive.

WSDOT is one notable exception. The DOT has refined its project management process to include best practices, tools, templates and examples for both pre-construction and construction management. Other good examples include Caltrans, Florida DOT (FDOT) and VDOT.

Caltrans' *Project Resourcing and Schedule Management (PRSM) Risk Management Plan* documents the process and procedures that they use to manage project risks. The plan explains how the project manager is to identify and track risks throughout the life cycle of a project, describes the tools used, identifies the person(s) responsible for managing various areas of risk, and the terms by which contingency plans are derived and implemented. FDOT offers project management training on the web. Other tools available include a risk-based graded approach, and a standard scope and staff hours

estimation guidelines. VDOT's online guidance presents the agency's project management policies and procedures for managing each project life cycle. The guidance for developing the project scope, budget estimates and project development schedules are available on the web.

VDOT and Louisiana DOTD believe that NEPA is a process and as long as the agency follows the process and the regulations, the risk is low. However, if the DOT does not pay attention to public and agency input, the risk is high. The agencies believe it is important to take the time to consider and address comments and make sure to follow through on commitments. Louisiana DOTD requires the consultant engineer to complete the National Highway Institute (NHI) NEPA training and at least one person on staff has to have archeology training. They also consider context sensitive solutions (CSS) training beneficial when selecting a consultant.

Several DOTs cited a lack of basic project management skills as a problem. Others indicated that engineers managing projects do not understand the NEPA process and therefore, budgets do not account for such big-ticket items as an EA or EIS and schedules are unreasonable because they do not account for such things as data collection, public involvement, and coordination with the resource agencies. In Virginia, a commissioner requested NEPA experts guide the NEPA process to get to a decision. Since implementing this change, VDOT has been able to cut in half the time it takes to complete a project.

Scope Management

The most commonly stated reason for changes requiring additional environmental clearances after the NEPA document is completed is changes that occur in final design and unforeseen construction problems in the field. This is particularly problematic when design changes result in additional impacts not previously considered or when there are changes to mitigation commitments. Even scaling back a project, for example dropping a lane, can change the economic analysis, and require reconsideration. A re-evaluation is used to address minor changes but changes in the project scope of EAs and EISs may require a supplemental document or a modification to the Record of Decision and impact the project schedule and budget. Projects with a protracted schedule may encounter additional problems if staff turnover has occurred at the resource agencies, or if regulations change during the interim. Value engineering done late in the process may also result design changes and a redo of work already completed.

Even states without a formal risk management process have taken steps to do what they can to reduce their risks. VDOT has a standard scope of work, including staff hours for EISs. It provides a basis of comparison with consultant proposals but VDOT does all the scoping for the consultant; VDOT directs and develops an estimate. VDOT also has an electronic comprehensive environmental data and reporting system (CEDAR) linked to budget and scheduling systems but it is not set up for risk analysis. The big risk points, according to VDOT, are the decision points between the draft and final EIS where the transportation board (not VDOT employees) makes the decision, and when FHWA issues a Record of Decision (ROD).

Budget Management

Some states use a gross estimate to determine budget and schedule, e.g. dollars per mile, based on previous projects. The budget and schedule are refined as the project detail is developed. Several agencies reported that the scope, schedule and budget are developed with input multi-disciplinary teams that include environmental staff.

When they know they have funding, one DOT refers back to the corridor studies to identify sensitive environmental issues and conducts an internal, multi-disciplinary team field review to identify problems with the concept. Agencies may sign off on an issue that is not a problem and that works well to reduce scope and cost, and at times downsizes the level of the NEPA document.

Schedule Management

New Hampshire DOT shares the project schedule with the public and other agencies. In bi-monthly meetings and at scoping, the DOT presents the schedule to the agencies to determine if the schedule is reasonable and they try to get general agreement. Typically, the DOT has good participation from the agencies, though the agencies do not usually provide comments. However, development and use of the schedule creates an expectation and provides a framework that keeps projects on track relatively well.

Contract mechanisms can also be a problem. In an attempt to improve project schedules, Colorado has a pilot project in progress wherein Colorado DOT (CDOT) categorized potential impacts as one of three types for each resource:

- Expect impacts to a critical resource, and/or there will be a lot of public concern, or the project is in sensitive habitat
- Impacts are unknown but can be mitigated
- Little or no impact to the resource

These categories were worked into the consultant's contract and the consultant is to focus on the critical issues. Discussions on other non-critical issues are limited to one page. CDOT will evaluate the results of this process at end of the project. This could prove to be an effective way to keep NEPA documents focused on the real issues.

Staff Turnover and Staff Shortages

Staff turnover and staff shortages are major problems for nearly every agency, with frequent impacts to project schedules. For example, one DOT said the FHWA has had six different operations engineers and it takes a long time to bring them up to speed – perhaps doubling the time for decision-making. In Alaska, staff turnover at the USACE meant working with four different representatives over the course of one project, resulting in inconsistent direction and a loss of time.

DOTs are often frustrated when they send Federal, state and local agencies scoping invitations but do not get substantive input until late in project development. Resource agencies, already stretched too thin, have limited staff available for transportation projects. The agencies are often reluctant to spend limited resources on scoping and early project development when a project is not far enough along in design to assess potential impacts. As a project advances through the NEPA process, project scopes often change significantly such that the agency's early input may not be applicable to the final product. Nevertheless, failure to participate at the requested time can result in schedule delays or having to re-do work late in the process in order to address the agency's concerns.

Several interviewees noted that DOT staff often leave the agency to take higher paying jobs with consultants, and with that turnover there is a loss of experience, historical knowledge of processes, agreements and commitments, as well as working relationships with other agencies. State DOTs often fund positions at the resource agencies to help resolve issues, keep communications open, and build trust as well as accelerate reviews and approvals. For example, Connecticut DOT funds a position at

the Department of the Environment to help merge requirements for Federal and state permits. In 2005, over two-thirds of state DOTs funded interagency positions. The number of funded positions ranged from one in Colorado to 36 in Florida.

DOTs also rely heavily on consultant support to fill staffing gaps and, while there is not a shortage of consultants, several interviewees indicated that consultants don't always produce work of the desired quality, requiring additional time and budget for the DOT to redo the consultant's work. DOTs' NEPA guidance has helped establish standards the consultants must meet.

One interviewee noted that, in certain circumstances, SAFETEA-LU (6004) allows DOTs to assume the responsibility and liability for categorical exclusion (CE) type projects and expects that would speed up the process. However, since the DOT is short on staff and has a high turnover rate, it is impractical for the agency to take advantage of the potential time savings they could gain by taking responsibility for CEs.

Working Relationships/Collaboration

Interviewees discussed the working relationships between the DOTs and FHWA, DOTs and the resource agencies, and internal relationships between project team members.

DOTs rated working relationships with the FHWA from "very difficult" to "very good". Criticisms included such things as "too much micro-management" and "FHWA looks for things wrong with the document", "they make comments without reading the document," and "they make comments like 'redo' but don't give any direction on what is to be redone". Another commenter said FHWA review times are too long and the agency frequently changes their mind on what they want. In at least one case, FHWA staff had differing opinions and difficulty coming to agreement and the Division Office leadership maintains a skeptical stance toward the DOT.

At the other end of the spectrum, VDOT enjoys a very tight relationship with their FHWA Division Office. VDOT said, "The Virginia Division office has a hands-on approach that is very helpful in solving problems with the other agencies. We cannot say enough good things about the Division Office; we are on the same page all the time. We are fortunate to have a strong and extremely competent FHWA Division Office."

Most DOTs stated the key to success is having good working relationships with local governments and the resource agencies. The relationships are built over time and are based on mutual respect and trust. The relationships and the ability to work with practical, experienced staff are highly valued by all concerned. In Idaho, the DOT has good relationships with the State Historic Preservation Officer and the tribes because they all work together and know each other. There are no turf wars because they all come at it from a practical perspective.

VDOT started a partnering process with the resource agencies because they feel their input is important and, if they are going to need permits, VDOT starts "partnering" with the resource agencies very early. They do not want to get to the end of the process and not be able to get permits. The DOT follows a collaborative process with all the agencies similar the NEPA/404 merger process. VDOT also noted it is important for the agencies to know the DOT will deliver on their commitments.

FDOT districts spend a lot of time with the resource agencies, conducting joint field reviews and sharing draft technical reports so there is collaboration all along. "Communication, coordination and good working relationships build trust and

confidence. When this happens, it makes it easy to solve problems and implement both agencies' missions."

Many of the interviewees indicated they had good internal collaboration. ITD said, "Everybody is on-board with the NEPA and environmental process. We have excellent support from the top down." In contrast, a couple of interviewees said that relationships work at the staff level but decisions fall apart when they go to upper management which results in additional work and delays.

Conflict Resolution

State DOTs have multiple mechanisms for handling conflicts that arise during the NEPA process. For example,

- At WSDOT, when there is a dispute, both sides develop an issue paper at the staff level. This helps ensure there are no misunderstandings. If an issue is not resolved at the staff level, it is elevated. They have a 10-day turn around requirement to make sure problems get resolved in a timely manner and the project can keep moving.

- VDOT has a conflict resolution process they use in cases where partnering efforts fail and they are unable to reach an agreement; however, they have not had to use it in a long time. Upper level management works closely with the FHWA to alleviate many problems and there are few disputes. Additionally, the project development process is such that disagreements are kept to technical issues that can be resolved with a little give and take.

- Utah DOT finds it helpful to have individual agreements on each project that defines roles and responsibilities, milestones, and the chain of command.

Most of the interviewees said their agency does not have a formal conflict resolution process but they are able to work through issues in face-to-face meetings or project meetings with the agencies and DOT staff. Several interviewees noted maintaining good working relationships is the key to successfully moving projects forward in a timely manner.

1.7 Training and Tools

Directions for responding to questions regarding the effectiveness of various tools and training available to project managers were not clear in the web-based survey and thus we did not try to quantify the results. However, in the telephone interviews, respondents were asked to clarify their rankings and we can draw some general conclusions from their responses:

- Respondents viewed training on the NEPA process, the public involvement process and tools, and CSS training as the most beneficial.

- Most agencies have a comprehensive NEPA guidance manual available.

- Monthly newsletters and other systems for sharing lessons learned were generally viewed as the least effective tools.

- Most project managers rated mentoring as ineffective but at least one agency relies primarily on on-the-job training.

1.8 Organization of the Remainder of this Report

Section 2 – The Role of the NEPA Project Manager discusses the project manager's role in using the NEPA process to be a good environmental steward while making good transportation decisions.

Section 3 – Importance of Project Management in the NEPA Process discusses the project manager's role managing the project timelines, budget, and important contributing factors to a quality NEPA document.

Section 4 - Earlier Decision-making: Linking Planning and NEPA discusses the benefits of linking long-range planning processes to the NEPA project development phases to create a ripple effect of efficiencies throughout the remainder of the process.

Section 5 - Scoping Process Improvements discusses the importance of taking the time to do a robust scoping effort that will lay a solid foundation to keep internal and external stakeholders focused on solving the transportation problem, and minimize scope and schedule creep.

Section 6 - Management of the NEPA Phases discusses ways to inject efficiencies into the major phases of the NEPA process by returning to the basics, as well as tips for producing a legally sufficient document and improving the quality of NEPA documents.

Section 7 – Project Management discusses proactive ways the project manager can manage risk, project schedules and staffing, and provide case examples from many state DOTs.

Because implementing SAFETEA-LU was a major concern expressed in the interviews, the following discussions weave in the requirements and FHWA guidance for implementing SAFETEA-LU, where applicable.

2 The Role of the NEPA Project Manager

Transportation inextricably links our quality of life nationwide and in our individual states and communities. Highways, streets, and sidewalks greatly influence this connection and play a large role in our lives.

Transportation NEPA project managers are stewards of not only the transportation system and important public investments in that system but NEPA project managers are also stewards of community well-being and the natural resources on the landscape. NEPA project managers are stewards of interagency relationships and how agencies can collaborate to achieve "better than before" results that serve the public interest.

The NEPA project manager must use the NEPA process to make good transportation decisions and to create meaningful and effective partnerships to design and deliver a better project. Efficient and effective analysis and disclosure of a project's impacts to the existing environment ensures the NEPA process also serves the public's interests and the public investment is not wasted.

DOT project managers, including NEPA project managers, wear many organizational hats. Project managers are responsible for many components of the project development process that require a high degree of insight, professionalism, and cross-disciplinary knowledge. To varying degrees, NEPA project managers are also organizational leaders. They use, participate in, and continually improve the environmental review, project development, and project management processes. As leaders, intentionally or by default, NEPA project managers should know about the following at their organization, and be involved in developing the necessary resources, if gaps exist.

- **Stewarding the environment and "making it better than before."** Does the office or project office have an environmental stewardship policy, seeking ways where practicable, to add environmental value in connection with its projects and practices? How are these policies implemented in the course of your work?

- **Identifying what you have learned and continuously improving the process.** How is your agency recording lessons learned, how well commitments are kept, and procedures are followed? How can these processes be improved? Does the organization evaluate long-term performance of practices that affect the natural, built and human environments and are adjustments made to continuously improve those practices? Environmental management systems offer one process for organizations seeking to continuously improve, but ordinary strategic planning, tied to regular organizational performance evaluation can also address this need.

- **Transparent and participatory process and decision-making.** Are projects planned and designed with decision-making that is transparent and participatory?

3 Importance of Project Management in the NEPA Process

When applied proactively, NEPA provides an effective tool for planning environmental compliance throughout a project's life cycle, and reducing long-term project risks and scheduling delays.[5]

Sound and effective project management is key to the successful delivery of a state's transportation program. Management of project timelines, cost, and important contributing factors to timelines and cost, such as the environmental process, have become critical concerns for state DOTs.

Although environmental clearance constitutes only one part of the larger Project Development Process (PDP), it is frequently cited as a reason for project delays. Ranked just below changes in funding and/or project costs, environmental clearance is second on the list of factors causing changes in letting programs.[6] Unlike engineering design and construction, which have well defined beginning and ending points and milestones, the environmental process is dynamic, continuous, and varies considerably from project to project. However, inefficiencies and delays are not inherent in the NEPA requirements and there are methods for reducing costs and delays through a better understanding of the process.

The potential impacts to projects of less than efficient management of the NEPA process are serious, as difficulties predicting and controlling schedule and costs generate many problems and risks for DOTs. Impacts to financial accountability and accurate project scheduling are among the most serious. When project costs unexpectedly exceed the programmed budget, the result is usually a delay or cancellation of other projects. Unreliable estimates can generate severe problems in a DOT's programming and budgeting in local and regional planning and result in staffing and budgeting decisions that compromise the effective use of resources. In turn, this affects the DOT's relations with the state's transportation commission, legislature, local and regional agencies, and the public.

In addition to complying with the multiple disciplines encompassed by NEPA, project managers must demonstrate compliance with a myriad of other environmental laws, rules, regulations, and executive orders. The wide range of technical issues and a highly complicated environmental process have the potential to affect project design, costs, and schedule. Complicating matters, the environment itself is never static; conditions are always changing. This will become more so in an era of major changes in land uses, declining natural and cultural resources, and climate change.

Effective project management techniques offer DOT project managers tools to deal with uncertainty and risks, avoid delays, and prevent cost overruns, while navigating the NEPA and other federal environmental regulations, including Section 106 of the *National Historic Preservation Act* (NHPA), Section 404 of the *Clean Water Act* (CWA), the *Clean Air Act*, Section 4(f) of the DOT Act of 1966 and the *Endangered Species Act* (ESA) and the many other state environmental laws and regulations that apply to transportation projects. Project management techniques are discussed beginning in Section 7 of this guide.

4 Earlier Decision-making: Linking Planning and NEPA

Linking Planning and NEPA is:

> *"a collaborative process that combines transportation planning across all* modes and options, with land use and human and natural resource plans"

<div align="right">

Executive Order (EO)13724
Purpose and Need Working Group

</div>

4.1 SAFETEA-LU and Long-Range Planning

Sections 3005, 3006, 6001 and 6002 of SAFETEA-LU require consideration of the environment in both statewide and metropolitan planning.[7] Section 6001 of SAFETEA-LU made two significant changes that require a heightened consideration of environmental issues in the planning process. These are (1) the need to include a discussion of environmental mitigation activities in the state and metropolitan long-range transportation plans and, (2) the need to consult with state, tribal, and local agencies, including a comparison of transportation plans with resource plans, maps, and inventories.[8]

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 the natural environments. In addition, the regulations state that the discussion of environmental mitigation activities may focus on policies, programs, or strategies, rather than at the project level in both the statewide and metropolitan planning processes.[9]

4.2 Planning and Environmental Linkages

Linking planning and NEPA is the connection between system-level planning and project-level decisions. In 2005, FHWA and Federal Transit Administration (FTA) issued joint guidance to encourage agencies to use the transportation planning products in the NEPA process to improve decision-making and increase predictability in the project development process.[10] Planning and Environmental Linkages (PEL) (a more robust process than what was historically referred to as "Linking Planning and NEPA") is the transportation decision-making process that comes before the decision to fund a project and include it in the statewide transportation improvement program (STIP). It lays the foundation for purpose and need, defines the range of alternatives and eliminates some of them, and provides a basis for public involvement and documentation in the NEPA process.

Inconsistent or incompatible goals and priorities among transportation, community and resource agency plans are a major source of conflict and delay during NEPA. Integrating these discussions during long-range planning and developing a consensus on how to smooth or rationalize the inconsistencies early on creates significant time and money savings⸺tangible benefits for transportation decision-making.

As previously discussed, in our 25-25(27) survey of 50 DOT and FHWA NEPA project managers across the country, only five said they are involved in the long-range planning

process. In follow-up telephone interviews with 13 project managers, seven said their agency does not have a process for linking planning and NEPA, and six indicated they use the process to a very limited degree. Project managers gave a number of reasons their agency has not fully integrated the planning and NEPA processes including insufficient time and staff, the lack of participation by outside agencies and the public, inadequate data and, for some, an unproven benefit of the process. Additionally, interviewees mentioned that people and organizations are often reluctant to change from the old way of doing business.

For more than 10 years, the FHWA and some state DOTs have recognized that consideration of environmental, community, and economic goals early in project planning and carrying those goals through project development, design, and construction can lead to a seamless decision-making process that minimizes duplication of effort, promotes environmental stewardship, and reduces delays in project implementation.[11] FHWA emphasizes that moving some NEPA decisions to the planning phase of project development can result in significant benefits. FHWA summarized those benefits as follows.[12]

- **Relationship-building benefits**: By enhancing inter-agency participation and coordination efforts and procedures, transportation planning agencies can establish more positive working relationships with resource agencies and the public.

- **Process efficiency benefits**: Improvements to inter-agency relationships may help to resolve differences on key issues as transportation programs and projects move from planning to design and implementation. Conducting some analysis at the planning stage can reduce duplication of work, leading to reductions in costs and time requirements, thus moving through the project development process faster and with fewer issues.

- **On-the-ground outcome benefits**: When transportation agencies conduct planning activities equipped with information about resource considerations and in coordination with resource agencies and the public, they are better able to conceive transportation programs and projects that serve the community's transportation needs more effectively. Linking the planning and NEPA processes can lead to fewer negative impacts and increased environmental stewardship.

Questions to Ask in Planning

There are a variety of questions that can be asked or pursued on the planning level, to address sustainability, support the NEPA analysis, and streamline NEPA project management in project development. The following issues are increasing in importance and public interest; they often emerge in the NEPA analysis process, but are really more pertinent and applicable on the planning level. Project managers should consider the following questions when making decisions in the planning process. Taking the time up front to

> Address potential environmental problems in the planning stage before they become significant and expensive obstacles during the implementation phase.

answer as many of these questions as possible will improve the project manager's ability to develop an accurate project schedule and cost estimate. Addressing potential environmental problems in the planning stage can also minimize significant and expensive obstacles during the implementation phase.

<u>Stakeholder Involvement</u>

- Does the project planning process emphasize outreach to ensure stakeholder involvement through all phases?

- Does the professional project planning team include all relevant disciplines?

- Is there a sense of mutual support and commitment within the project team to a project outcome that meets or exceeds expectations?

<u>Purpose and Need</u>

- Do goals and objectives address the development of a transportation system that is environmentally, socially, and economically sustainable?

- Do goals and objectives include preservation and maintenance of the existing transportation system?

- Do goals and objectives include linking transportation and land use?

- Do objectives include reducing severity, number and costs of accidents?

- Does the planning process include the development of several future land use/development scenarios? Has the community identified a preferred land use/development scenario (in light of possible future constraints)?

- Did the different land use and transportation scenarios consider energy and emissions reduction factors?

- Does regional or state policy include planning and design policies that promote energy conservation?

- Does the plan reflect a desired balance between the need for access and mobility, the planned land use pattern, and the possibility of induced travel?

- Do goals and objectives focus on optimizing movement of people and goods, and not just vehicles?

- Have appropriate stakeholders been involved in defining the problems and in articulating the purpose and need for transportation improvements?

- Have the purpose and need statements associated with transportation improvements been accepted by stakeholders (particularly environmental resource agencies) in a manner that will have standing during subsequent environmental analyses?

<u>Alternatives</u>

- Is the proposed improvement logically linked to the existing and planned network?

- Have alternative strategies been considered on a multi-modal basis?

- Do alternative strategies include demand management?

- Do alternative strategies include operational efficiencies?

- Is there an alternative that focuses on avoiding or minimizing impacts to the natural environment?

- Are managed lanes (high occupancy vehicle (HOV), high occupancy toll (HOT), bus-carpool) being considered?

- Were tolls considered as a method to manage demand, in addition to raising revenue and recovering costs?

4.4 Collaboration

The importance of collaborative partnerships among Federal, state and local transportation agencies and resource agencies cannot be over-emphasized. A true collaboration is based on interaction that honors each agency's mission and goals and seeks to identify opportunities to advance everyone's priorities. In keeping with the emphasis on early and continuing involvement of all agencies in project planning and environmental activities, it can be considered another streamlining tool. In early planning, the agency should identify problems and develop strategies to reduce the level of conflict. Strategies may include:[13]

- Interagency MOUs

- Programmatic agreements to define how the agencies will conduct environmental reviews

- Environmental streamlining agreements for expedited project reviews

- Development of a dispute resolution process that provides a structured framework for constructive management of project-level conflicts and collaborative decision-making. Examples include setting timeframes for providing and responding to issues, meeting protocols, and procedures for upward referral of disputes.

Internally, collaboration is also essential among the organization's planning, environmental, engineering and other project development professionals. No other single project management skill may be as important to the success of a project as developing and maintaining good working relationships.

4.5 Documentation

The only way to ensure that the analysis and decisions made in planning meet NEPA standards and can be carried forward to the NEPA process is to provide comprehensive and acceptable documentation from the planning process to the NEPA process. NEPA is a procedural law, meaning that the legal standard used is based on the quality and completeness of the process to reach decisions. The EA or EIS ultimately will be judged by the standards applicable under the NEPA regulations and guidance from the Council on Environmental Quality (CEQ), and therefore, any planning data or decisions incorporated in the document must meet the NEPA and CEQ standards.

The intent is not to require NEPA studies in the transportation planning process. Rather, the goal is to document planning level information to NEPA standards and append this information or reference it in the final NEPA document. While this may create additional work during planning, with this higher standard of documentation it is possible to avoid revisiting decisions or redoing work in project development and NEPA analysis. The benefits in terms of delivering quality projects on time and in budget are worth the effort.

4.6 Guidance for Implementing Planning and Environmental Linkages

Several sources of excellent source of guidance for linking planning and NEPA are available.

Executive Order 13274

In 2002, President Bush signed Executive Order 13274, *Environmental Stewardship and Transportation Infrastructure Project Review* issued to promote environmental stewardship in the nation's transportation system and streamline environmental of transportation projects. An interagency Task Force was set up to oversee implementation of EO 13274. In turn, the Task Force created three Work Groups to develop recommendations regarding three aspects of the environmental review process: (1) project purpose and need, (2) indirect and cumulative impacts, and (3) integrated planning. The *Baseline Report and Preliminary Gap Analysis*[14] developed by the Work Group for integrated planning is perhaps the most comprehensive guidance available for integrating planning and NEPA. The report sets out a process to advance current DOT and interagency environmental stewardship and streamlining efforts, to coordinate expedited decision-making related to transportation projects across federal agencies, and to bring high-level officials to the table to address priority projects.

The report includes:

- A description, at a macro scale, of the planning processes that affect transportation project development and delivery, assesses where opportunities for linkages between transportation, land use, and natural and cultural resources planning exist.

- A description of current laws and regulations that influence planning processes and project decisions

- A compendium of innovative practices to demonstrate how practitioners in the field have designed and implemented integrated approaches The report provides a number of strategies for accomplishing the goals and objectives of the linking process and for overcoming many of the barriers DOTs face in implementing the process.

Strategies include:

- Use each other's planning outputs for air quality, threatened and endangered species, historic preservation, water quality, and land use.

- Develop innovative institutional mechanisms including inter-agency task forces to provide strong leadership, and inter-agency Memorandums of Understanding (MOU) and Memorandums of Agreement (MOA) to define how the agencies will interact throughout the planning process.

- Take advantage of state-of-the-art technology such as GIS and remote sensing to replace manual data collection.

- Follow an effective and transparent decision-making process to ensure adequate coordination, sustainability of commitments through project design and implementation, and seamlessly link the results to the NEPA process.

SAFETEA-LU – Integrated Planning

SAFETEA-LU 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 utilization of planning products in the NEPA process. FHWA's SAFETEA-LU guidance (Question/Answer 35) states:

"Transportation objectives developed during the transportation planning process and identified in a statewide or metropolitan transportation plan can be the primary source of the project's purpose and need statement. …When the transportation planning process produces a specific purpose and need statement for a particular project, that purpose and need can be used in the environmental review process as follows: If the specific steps outlined in this guidance to identify participating agencies and to involve these agencies and the public in the development of the project purpose and need were taken during the transportation planning process, then further review of the project purpose and need may not be necessary; otherwise, the participating agencies and the public must be provided an opportunity for involvement once the environmental review process has been Initiated."

In other words, initiating public and agency involvement early in planning to develop the project's purpose and need can streamline the environmental review process provided the criteria for inclusive public and agency involvement are met, and the process and decisions are well documented.

Many DOTs are in the process of developing 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 DOT's may be useful to those DOTs who are still developing their own process.

FHWA Guidance – Planning and Environmental Linkages

FHWA developed a set of indicators designed to help agencies strengthen NEPA and planning linkages.[15] The indicators can also help agencies identify available assistance and potential FHWA activities that can provide that assistance. Indicators are grouped into five categories:

- Indicators for **Change Management** include internal leadership, organizational structure, training and development of performance measures.

- **Data and Analysis Tools** indicators include documentation of existing resource data, data sharing, tools for analysis, and efforts to improve data.

- **Inter– and Intra- Agency Coordination** indicators include interagency MOUs and MOAs among agencies to define related procedures, inter-and intra- agency working groups to improve collaborative decision-making, inter-agency funded staff positions, and positive staff perceptions.

- Indicators for **Decision Process Refinement** are documentation of current decision processes, and documentation of new procedural or analysis guidance.

- Indicators for **Linkage Activities Undertaken** can help the agency:

  - Assess their current practices related to stakeholder involvement

  - Hand-off the NEPA products produced in planning to the NEPA analysis

  - Compare transportation plans to natural and cultural resource inventories

  - Use analysis tools such as CSS, community impact analysis, and scenario planning

  - Consider mitigation opportunities, design guidance, and ensure planning decisions are carried through in project development

For each indicator, FHWA guidance for the *Implementation of Planning and Environmental Linkages* provides examples, and where available, web links to additional sources of guidance, tools, training, and additional case studies.

AASHTO Practitioner's Handbook

AASHTO's Practitioner's Handbook 10, *Using the Transportation Planning Process to Support the NEPA Process* is intended to assist practitioners improve linkages between the planning and NEPA processes.[16] The handbook provides a succinct overview of the background of the regulations and the SAFETEA-LU requirements.   It provides practical tips for practitioners including organizational changes for improving internal and external working relationships, developing the purpose and need, eliminating alternatives, identifying potential environmental impacts and mitigation strategies.

4.7 DOT Examples of Linking Planning and NEPA

Colorado DOT's On-line Training

Colorado DOT acknowledges their linking planning and NEPA process is still evolving; however, they have made significant progress in developing guidance for project managers, planners and regional transportation planners to integrate NEPA information into statewide and regional transportation planning processes. CDOT developed an interactive *Linking Planning and NEPA* training program available on their web site.[17] The training incorporates the SAFETEA-LU requirements, particularly the new environmental consultation and mitigation requirements for the transportation planning process. Among other things, CDOT's guidance provides a practical "how to" guide with numerous case studies of successful examples of Linking Planning and NEPA from Colorado and other states that will be helpful for those DOTs struggling to implement this process.

Louisiana's "Stage Zero"

Louisiana DOTD holds meetings with the legislators to gather their input on the long-range plan and provide a mechanism for public input. When a project is first proposed, Louisiana DOTD performs a "Stage 0" feasibility analysis to determine whether it merits further consideration.[18] The decision to continue through the project delivery process is based on a series of analyses that include:

- **Preliminary Purpose and Need**: A preliminary description of the transportation problem or other needs that the proposed project is intended to address.

- **Preliminary Alternatives and Initial Feasibility Analysis**: Development of conceptual alternatives considered technically feasible, including potential impacts analysis and discussion of project challenges.

> *"You can't start coordination with the resource agencies too early in planning. Involve them in the Purpose and Need Statement, because that drives (or should drive) the alternatives for solving the problem."*
>
> Richard Brandman
> Transportation Manager
> Metropolitan Services District

- **Design Criteria and Initial Context Determination**: Identify preliminary basic design criteria, which may include ROW and utility impacts, among other things.

- **Preliminary Environmental Review**: Identify all known potential environmental "show stopping" constraints or issues that influence early determinations of project feasibility, timing, and cost, identification of major community issues, and a preliminary analysis of impacts of the project on the state or region's economy. At this time, the project is reviewed in the context of value planning/value engineering and for constructability.

- **Agency and Public Involvement Plan**: Identify agencies with jurisdiction and interested public or private parties that expressed an interest in the project, and other information relevant to the development of a public involvement plan in "Stage 1".

- **Preliminary Project Estimate and Budget**: Development of estimated costs for engineering design, ROW acquisition, utility relocations, construction, and environmental mitigation costs, in current year dollars.

The project proposer or various sections within Louisiana DOTD, depending on the nature of the project, perform the activities outlined above but are not required to assemble a project team at this phase.

Maine's Integrated Transportation Decision-making Process

Maine DOT's integrated transportation decision-making process integrates the requirements of NEPA, Maine's Sensible Transportation Policy Act, and the USACE Highway Methodology for Section 404. [19] The 10-step process provides a linkage between planning and project development through improved coordination, and early and concurrent involvement of all agencies in the NEPA decision-making process. The process also includes reorganization of the department, a programmatic CE process, and monthly meetings with resource agencies. Review activities are done concurrently, documentation and record keeping are consolidated, and environmental considerations are included in decision-making by Maine DOT and its partners.

Maine DOT reports that some of the benefits are difficult to measure quantitatively, but the process has led to better decisions due to better and earlier communications among the parties. Cost estimating is improving because project scope is established earlier in the process and projects are moving more swiftly. By initiating CEs in planning, before design, CEs do not delay advertisement and project managers are better able to control scope creep. Public Advisory Committees have been helpful in avoiding controversy. The NEPA process is now considering social impacts, whereas it previously gave greatest attention to impacts on the natural environment. The planning step is starting to look at cumulative and secondary impacts as well, if only in an intuitive way.

4.8 Getting Started – FHWA Resources

Excerpted directly from the FHWA web site, the following provides a wealth of information that can help decipher the SAFETEA-LU requirements and provides the tools to assist DOTs to develop or improve their planning and environmental linkages process.

A project manager can do a lot to implement Planning and Environment Linkages. To apply the approach, multiple activities can be undertaken to improve different stages of the transportation decision-making process. Some activities will emphasize internal integration, in which the various transportation development functions are reconfigured to work better together. Others will emphasize external integration, in which coordination between transportation, resource, and land management agency processes is

heightened. To learn more about Implementation activities, and indicators to help guide implementation, visit the Implementation page.

Below are a number of steps you can take to begin integrating planning and environmental processes in your area:

- Read about Planning and Environment Linkages on the Publications page and explore the Case Studies page to learn from the experiences of state or metropolitan areas that decided to change their approach to conducting planning and environmental processes.

- Get trained on Planning and Environment Linkages concepts. Relevant training courses include:

- Linking Conservation and Transportation Planning Workshop assists state DOTs, MPOs, and state and Federal resource agencies to better coordinate and integrate transportation and conservation planning data and activities.

- FHWA's GIS for Environmental Streamlining and Stewardship (GIS4EST) Workshop supports the adoption and development of GIS technologies to promote environmental streamlining and stewardship in transportation decision-making.

- The Conservation Fund's Green Infrastructure Course provides a way to plan and implement interconnected green space systems in conjunction with existing and planned transportation infrastructure.

- Make a list of specific Planning and Environment Linkages implementation activities that your agency and/or partner agencies are undertaking or would like to pursue.

- Discuss Planning and Environment Linkages and implementation practices with your peers in the Re: NEPA topic area Transportation Planning and NEPA linkages.

5 Scoping Process Improvements at DOTs

Too often, project managers look at scoping as a single public meeting held at the beginning of the NEPA process. When viewed in this light, scoping is one of the most overlooked opportunities for injecting efficiencies into the NEPA process. The scoping process can be used to:

- **Develop the purpose and need with the buy-in of the public and resource agencies**. This builds trust and credibility and minimizes the potential for disagreements and delays later in project development.

> Scoping is one of the most overlooked opportunities for injecting efficiencies into the NEPA process.

- **Identify significant environmental issues** deserving of study and, as just important, those issues that can be deemphasized or eliminated from detailed study to avoid investing time and money on unnecessary analysis.

- **Identify problems early** to ensure they are properly studied.

- I**dentify the study area** for the impacts analysis.

- **Reach agreement on impact analysis methodologies**.

- **Reach agreement on a schedule**.

- **Set page limits**. As part of scoping, an agency may set page limits. This is often overlooked opportunity to help manage the size of the document.

5.1 Scoping for NEPA

Scoping is the formal early coordination process for determining the scope of issues to be addressed in the NEPA analysis and for identifying the significant issues related to a proposed action. A CEQ memo (April 30, 1981) regarding scoping guidance outlined the following scoping objectives:

- **Identify the affected public and agency concerns.**

- **Facilitate an efficient EIS preparation process** by assembling the cooperating agencies, assigning EIS writing tasks, ascertaining all the related permits and reviews that can be scheduled concurrently, and setting time and page limits.

- **Define the issues and alternatives that will be examined** in detail in the EIS while simultaneously devoting less attention and time to less important issues.

- **Save time in the overall process** by helping to ensure that draft statements adequately address relevant issues, reducing the possibilities that new comments will cause a statement to have to be rewritten or supplemented.

Thus, scoping has much to do with the efficiency of the NEPA project management process.

5.2 Importance of Scoping

DOTs can lose a lot of time debating poorly documented decisions based on incomplete information or inadequate documentation. Similarly, failure to clarify agency

requirements, needs, and expectations on a broader level can exacerbate conflict during specific project development phases.[20]

The importance of taking the time up front to identify accurately the scope of a project cannot be overstated. A robust scoping effort will lay a solid foundation to keep internal and external stakeholders focused on solving the transportation problem and minimizing scope and schedule creep.

As important as this first step is, many DOTs report that they do not begin scoping until after the NEPA process begins. Frequently the DOT and other agencies lack the resources to devote the time up front, although it can ultimately save a significant amount of time and money in the long-term.

Benefits of a sound scoping process include:

- Better cost estimates
- Alignment with performance goals
- Less rework
- Predictable delivery schedule
- Reduced scope creep in project development
- Greater public trust
- Improved coordination with partners
- Everybody on the team working toward the same goal

5.3 Documentation of the Scoping Process

To be transferrable to the NEPA study, the scoping process must be well documented. Thus, the following actions are recommended:

- Keep a record of all meetings, including a summary of the meeting and all decisions and agreements made.
- Retain all written correspondence with the agencies to prove that a good faith effort was made to include all interested publics and agencies.
- Retain a record of all public and agency comments and describe how the NEPA analysis will address the comments.

5.4 DOT Scoping Process Examples

A number of state DOTs have a notable scoping process that can be a model for other state DOT project managers interested in improving processes in their own states or who may want to use the checklists and resources developed by their peers.

Caltrans' Preliminary Analysis Report

The *Preliminary Environmental Analysis Report* (PEAR) provides an initial environmental evaluation of a project and all feasible alternatives before it is programmed in the STIP or the State Highway Operation and Protection Program (SHOPP).[21] The PEAR also estimates the scope, schedule, and costs associated with completing environmental compliance. Because the environmental process can have a substantial impact on the project alternatives, design, costs, schedule, and delivery, the PEAR must clearly

present and discuss the results of preliminary environmental studies to identify environmental constraints that may affect design.

The PEAR Guidance describes the roles and responsibilities of the environmental staff and the framework for preparing individual resource reports. Literature reviews and windshield surveys are used to document the background and presence of environmental and cultural resources, any special considerations, and the estimated time for the completion of the environmental documentation and compliance. Caltrans also uses the PEAR to identify special considerations such as construction constraints due to work windows, NEPA/404 process, Section 7 consultation, etc., and discuss any potential mitigation measures. The information contained in the PEAR serves as the foundation for facilitating early consultation with Federal and state resource agencies.

Florida's Efficient Transportation Decision-making

Florida DOT's *Efficient Transportation Decision-making* (ETDM) process provides transportation planners, project analysts and project managers with sufficient information to plan and develop projects in compliance with all Federal and state environmental laws with uniform quality. The process includes a planning screen and a programming screen to engage agencies and the affected community earlier than they were in the traditional planning process.[22] Information and recommendations from the agencies and the public as a result of these screening events are summarized and help identify the technical studies and preliminary engineering that may need to occur during project development, and, thus, estimate environmental costs.

A planning screen occurs in conjunction with the development of long-range transportation plans. This initial screening of planned projects allows participants to review project purpose and need statements, and comment on the potential impact of projects to environmental and community resources very early in the planning process. FDOT uses an Environmental Screening Tool (EST) to evaluate and document the direct and indirect effects of proposed projects. This opportunity enables planners to adjust project concepts to avoid or minimize adverse effects, consider mitigation alternatives, and improve project cost estimates through early consideration of environmental matters.

The programming screen occurs before projects are funded in the FDOT 5-Year Work Program. Input on the potential effects to environmental and community resources are the basis for agency scoping to facilitate compliance with federal and state environmental laws. Lead agencies decide on a Class of Action Determination for each priority project summarized along with potential project effects, preliminary project concepts, reasonable alternatives, and scoping recommendations.

Minnesota DOT's Scoping Tools

At Minnesota DOT (Mn/DOT), the end of scoping is the end of discovery for a project. Mn/DOT's new scoping process, implemented in 2006, is comprehensive and includes early identification of issues and concerns, helps identify "knowns" and anticipate "unknowns," and is used to document and communicate the risks and contingencies.

Scoping occurs early, before a project appears in the STIP. Mn/DOT assigns a project manager to each project to guides the project through scoping and project development. Functional groups are informed of the project and are expected to provide written recommendations for what should or should not be included in the project scope. The DOT specifies a timeframe allowing enough time for scoping, but the scoping period has a definite deadline. To use staff time effectively, Mn/DOT bases the number of projects

selected for detailed scoping on the size of the program and fiscal constraints of the district budget.

Mn/DOT has developed a number of comprehensive tools to aid in the scoping process. *Mn/DOT's Project Scoping Process* includes the following:

- Master Project Document List—a list of documents used in the Mn/DOT scoping process with space for adding links and completion dates to keep track of documents

- Planning Lists/Spreadsheets—a list to track needs, candidates, and projects through the project planning process

- Project Planning Report—a short summary of information gathered and decisions made in the project planning process

- Early Notification Memo—a memo and project summary to inform various offices of the project and solicit input

- Scoping Worksheets—worksheets for each functional group providing a list of the basic things to consider when scoping a project and documenting the functional group's recommendations

- Project Scoping Report—summarizes the scope

- Scope Amendments—a form to document the effects and approval of scope changes

- Project Modification Program Evaluation Document—a form to document a program change and determine the effects

Missouri DOT's Scoping Process Improvements

Due to budget pressure and increased public scrutiny, Missouri DOT (MoDOT) evaluated its scoping process and made significant improvements. In 2001, MoDOT created a Scope Management Team to develop a better process for scoping projects

In their research, the Team found that between 1999 and 2001, 43 percent of the projects deviated from the original budget estimate due to scope changes. Like many DOTs, the agency's scoping process was characterized by the following:

- Adequate project scoping did not occur at the beginning of the project resulting in chaos at the end

- The scoping process was not addressing the fundamental question, "What is the solution to the need?"

- Inadequate scoping at the beginning of the process compromised the agency's ability to deliver a quality product due to the chaos at the end of the process.

Additionally, scope changes were the leading reason for projects not meeting the original commitment date made in the STIP.   Their recommendations to improve MoDOT's planning and programming process included:

- Project managers are given the identified and prioritized needs instead of assumed solutions at the beginning of the scoping process, to allow the project team to identify the correct solution to meet the project need, establish an accurate budget and a reasonable project delivery schedule.

- Only preliminary engineering (excluding ROW and construction dollars) is included in the STIP to identify a project until the project scoping process is complete. This

allows the project team to complete the scoping prior to making STIP commitments for the scope, cost or delivery schedule.

- Additions or deletions to a project's scope after the STIP commitment has been made must have the approval of MoDOT management. This ensures that management is aware of the implications of the changes and limits scope modifications to only those that MoDOT management feels are critical.

- Management and Planning must review and concur with the project concept, budget and schedule early in the process to ensure that resources are not wasted developing solutions that do not solve the identified problem.

- Design of the solution must progress to at least the Preliminary Plan state prior to programming any ROW or construction funds, or prior to making any project-specific STIP commitments.

In their review of the existing process, the Scoping Team identified the need for improved involvement and input from the entire project team. To help address this issue, the team developed a standardized checklist of the most probable issues to be considered in scoping. The checklists are not all-inclusive and MoDOT expects that the lists will be modified to meet specific project needs. The checklist identifies the critical issues a project manager must have addressed for common types of projects. MoDOT developed check lists for project scoping, planning, project development, design, ROW, traffic, environmental, maintenance, construction and materials, public outreach, utilities and FHWA. These lists facilitate avoidance of leaving out items with adverse impacts to estimate accuracy.

In 2003, MoDOT published its recommendations for revisions to the project development manual and improved procedures.[23] Their key to scope management was to develop a detailed scope of the project early in planning and limit changes to only those necessary to deliver the project. MoDOT defined a project's scope as:

> A poorly identified scope that is broader than the purpose and need will result in an unnecessarily high project budget and schedule, while a scope which falls short will yield a project that accomplishes little of significance.

> *"the set of design parameters that precisely satisfy the purpose and need of the project. A poorly identified scope that is broader than the purpose and need will result in an unnecessarily high project budget and schedule, while a scope which falls short will yield a project that accomplishes little of significance."*

The Team asserted that only when the elements and limits of a project are well defined can accurate costs and project delivery schedules be forecast.

Virginia DOT's Scoping Process Improvements

VDOT has made a number of improvements to their scoping process over the past 10 years. The agency completed an internal review of its scoping process with the explicit goal of reducing scope creep. Attention focused on the pre-scoping process with emphasis on initial activities. VDOT developed several guidance documents and corresponding checklists to help with the scoping process.

To identify possible improvements to project scoping, VDOT's review task force interviewed 27 staff personnel representing five VDOT districts, one planning district commission, and FHWA. Interview questions addressed the role of scoping in project

development, the involvement of outside agencies, the use of documentation for tracking scoping-related decisions, and steps VDOT districts have since taken to improve scoping.

DOT representatives in the interviews noted problems grouped into three topics: (1) the link between scoping and other processes, (2) the involvement of outside agencies in scoping, and (3) scoping itself. A review of VDOT's scoping process identified a number of procedural problems:

- Insufficient number of personnel or insufficient experience of existing personnel

- Lack of clarity regarding what the scoping process should deliver

- Need to better document follow-up commitments and changes in scope that occur after project scoping

- Need for a single user-friendly source for obtaining all project information

- Lack of a clear purpose and need statement from the planning process

The internal review recommended four changes to the scoping process: (1) provide a purpose and needs statement, (2) establish an electronic system for recording a project's approved scope and subsequent scope changes, (3) schedule multiple project scoping meetings on the same day, and (4) perform scoping before the project is introduced into VDOT's STIP. Generally, VDOT has implemented the first three recommendations.

VDOT's Project Management Practices & Procedures Manual identifies the roles of various entities in the project scoping process, such as the project sponsor, the project manager, and specific VDOT work units.[24] The agency developed several checklists to help staff avoid overlooking important factors to include in the scoping meeting, maintenance features, and environmental issues. VDOT's Environmental Division uses a checklist that identifies key questions, such as whether a noise analysis is needed, whether water quality permits are required, and whether a Section 4(f) evaluation (which considers the impacts of takings from parks, recreational areas, historic sites, and wildlife refuges) is required.

VDOT uses two forms to formally record the results of the scoping phase. The LD-430 form contains results of the initial field review, project schedule, project cost, and six responsibilities. The LD-404 form certifies that the final project, just before ROW acquisition or construction, either has not deviated from the scope outlined in the LD-430, or has adequate justification for doing so.

6 Management of the NEPA Phases

Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork - even excellent paperwork - but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, and restore, and enhance the environment.

(40 CFR 1500.1)

NEPA establishes goals and procedural requirements, but grants agencies a wide degree of flexibility in how to implement those regulatory requirements. Initially, CEQ issued a series of

interim guidelines for preparing EISs but did not provide sufficient direction on how to comply. Consequently, agencies were often challenged on the adequacy and the level of detail of EISs and early NEPA court decisions often ruled in favor of additional detail. Over time, in an effort to develop "bullet proof" documents, agencies developed increasingly detailed and ponderous documents that can take many years and millions of dollars to complete but do not necessarily foster better decisions.[25]

Paradoxically, the regulations provide direction for restricting the length of EISs, encourage agencies to set time and page limits, and stress the need to focus on important issues and to deemphasize insignificant ones. Other streamlining methods, such as reliance on scoping to help agencies focus on key issues and incorporating material by reference are also encouraged. SAFETEA-LU reinforces the need to inject efficiencies into the NEPA process.

One opportunity agencies have to promote efficiency is to develop guidance for the consistent application and implementation of the process. Many DOTs have an environmental procedure manual or guide to the environmental process. Often such guides are developed for consultants, to help them understand and reach the DOT's standards for production of environmental documents and analyses in each of the environmental areas covered by NEPA. FDOT's guide is one of the most comprehensive and long-standing examples, used as a model by many DOTs in the process of developing their own. FDOT's guide is continuously updated and available as a live document on the web. Other DOTs have guidance manuals with varying levels of detail.

6.1 Purpose and Need

The statement of purpose and need for action is a mandatory component of a NEPA document (40 CFR 1502.13). The lead agency(ies), typically FHWA and the DOT, have the responsibility to define the "purpose and need" for the NEPA analysis. The Purpose and Need statement provides a critical foundation for successful decision-making, provides the basis for the development of reasonable alternatives, screening of alternatives, and is the basis for the no-action discussion. FHWA describes the basic ingredients of Purpose and Need as:[26]

> *"The purpose and need should be as comprehensive and specific as possible. For example, rather than simply stating that additional capacity is needed between two points, information on the adequacy of current facilities to handle the present and projected traffic, (e.g., what capacity is needed and the level of service for the existing and proposed facilities) should be discussed.*
>
> *Other information on factors such as safety, system linkage, social demands, economic development, and modal interrelationships, etc., that the proposed project will attempt to address, should be described as fully as possible. This will assist in pinpointing and refining the alternatives which should be analyzed. Further, it will in a sense "protect" those viable alternatives from sniping by external interests and capricious suggestions to study something else. If the purpose of and need for the proposed project are rigorously defined, the number of "solutions" which will satisfy the conditions can be more readily identified and narrowly limited."*

The purpose and need statement is a written description of the transportation problems (the need) and the solution to the problem (purpose). The purpose and need statement drives the alternatives development and analysis tasks, but it should not be so narrowly defined as to point to a single solution only. A well-defined purpose and need statement will assist in limiting the number of alternatives that will achieve the project goals. If the project purpose and need are rigorously defined, the number of solutions that will satisfy the need can be more readily identified. The purpose and need statement is the cornerstone of the alternatives analysis;

however, it is not the place where alternatives are defined or discussed.

Essentials of Developing Purpose and Need

The Work Group charged with developing guidance for implementing a streamlined environmental review process under EO 13274 formulated comprehensive guidance in the *Purpose and Need Work Group Baseline Report, Revised Draft*.[27] The report identifies attributes of good purpose and need statements and opportunities for improvements. It emphasizes the need for clear, concise and easy to read purpose and need statements focused on the transportation problem with environmental protection elements added as goals or benefits of the proposed project without making them part of the stated purpose.

The report goes on to discuss the importance of coordination with other Federal agencies that have jurisdiction over other resources in the project area such as the Clean Water Act, Clean Air Act, Endangered Species Act, etc. The NEPA/404 merger process is the most common agreement between DOTs and the COE to consolidate reviews and streamline the Section 404 permit application requirements. These types of merger agreements can get all the decision-makers to the table early, which can help the DOT identify issues and resolve them before they become a barrier in project development. However, this also requires DOTs to identify aquatic resources in the project study area as early as possible. To achieve the benefits of this process, the project manager must strive for collaboration or the coordination process can break down if disagreements over purpose and need occur as agencies view projects through the lens of their particular interests and strive to comply with multiple laws as individually interpreted by the different agencies.

The NEPA document should summarize the main problem or problems that point to the need for action. The purpose and need statement should describe the existing conditions and the projected problems if no action is taken. For project purpose, describe how a potential solution would solve the identified problem or need. Every effort should be made to develop a concise purpose and need statement that focuses on the main transportation problems to be addressed and avoids the use of jargon or complex language that may be difficult to understand. "Without a clear understanding of the primary purpose and need, resource agencies will sometimes provide comments on possible alternatives that do not always match the DOT agency's desired range of alternatives based on the primary need."[28]

One of the most common concerns expressed by DOTs is the length of the purpose and need statement. In the guidance for EO 13274, the working group recommended that a *concise*

Sample Structure for Purpose and Need Section of an Environmental Document

Introduction / Background – A short discussion of the context for the project, including location, background on an existing facility.

Purpose – A very clear, concise description of the primary goals the project is expected to attain (*usually no more than one or two paragraphs*).

Need – A description of the problems or unsatisfactory conditions that currently exist or are expected with the existing facility or project area.

Other Goals and Objectives – A description of desired outcomes that are not central to the purpose and need, but are nonetheless important considerations.

Excerpted from the
*Purpose and Need Work Group
Baseline Report, Revised Draft*

statement focused on the primary purpose and need for the project should be no more than one page in length, although it could be supported by a discussion of background/context or more detail on the problems being addressed. According to CEQ, the purpose and need statement should "typically be only one or two paragraphs long."[29] The guidance provides a sample structure for the purpose and need section shown in the box on the right.

The guidance also includes sample purpose and need statements, training, relevant laws and regulations, and case law.

AASHTO's Practitioners Handbook *Defining the Purpose and Need and Determining the Range of Alternatives for Transportation Projects*[30] is another resource that includes recommendations for defining the purpose and need for transportation projects and provides the background for the SAFETEA-LU requirements.

SAFETEA-LU – Public Involvement in Purpose and Need

SAFETEA-LU requires that a proposed project has clearly identified objectives for improving transportation conditions, such as:

- Achieving a transportation objective identified in an applicable statewide or metropolitan transportation plan

- Serving national defense, national security, or other national objectives, as established in federal laws, plans or policies

- Supporting and consistent with land use, economic development, or growth objectives established in applicable federal, state, local, or tribal plans.

SAFETEA-LU also requires lead agencies to give the public and participating agencies the opportunity to be involved in the development of the project purpose and need statement in a timely and meaningful way. Prior to SAFETEA-LU, the NEPA scoping process typically provided the opportunity for public input on the purpose and need and the range of alternatives and many agencies chose to do this with the release of the draft environmental impacts statement for public review and comment. Now, Federal requirements explicitly require the agencies provide and opportunity for public involvement in advance of the draft environmental impact statement. For some DOTs, this was already standard practice and no process changes were needed to comply with SAFETEA-LU. This requirement can be met early during the transportation planning process before an EIS is initiated, if the project is sufficiently well defined at that time, or later during the scoping process. The opportunity for input must be widely publicized. It may occur in the form of public workshops or meetings, solicitations of verbal or written input, conference calls, posting on websites, distribution of printed materials or other involvement techniques. As discussed earlier, this is an opportunity for agencies to identify issues early and resolve them before they become a barrier later in project development. It can save time in the overall process, build public and agency trust, and reduce scope creep. The opportunity must be provided prior to the FHWA's final decision regarding purpose and need. The provisions for public participation in developing the purpose and need are required for EIS documents and discretionary for EAs and CEs.

Defining the Study Area

As the purpose and need statement is being developed, the limits of the study area are also defined. The study area limits are based on the logical termini and the purpose of the project. There are two general criteria for defining the study area:

- It should be large enough to encompass a range of alternatives that meet the project purpose and need.

- The boundary should be large enough to allow for flexibility in the development of alternatives.

- The boundary should be large enough to evaluate the direct, indirect, and cumulative environmental and cultural impacts resulting from implementation of the project.

The study area typically includes communities/areas/neighborhoods within the project corridor and immediately adjacent to it. Physical barriers, land-use patterns, selected demographic characteristics, historical background, resident perceptions, subdivisions and historic neighborhoods can often delineate "Community" boundaries.

A project can have social and economic consequences for communities beyond the immediate geographic area. The study area must also consider the broader area of influence the project can have on air, water, wildlife and other resources that naturally move well beyond the footprint of the project.

Logical Termini and Independent Utility

FHWA regulations (23 CFR 771.111(f))[31] require that a project must be able to function on its own, a term known as "independent utility." A project with independent utility or independent significance means that it is usable and is a reasonable expenditure of public funds even if no other transportation improvements are made in the area. The project must meet a need without requiring the construction of adjoining projects. In addition, projects that have independent utility should be planned so as not to restrict the consideration of alternatives in adjoining segments.

As defined by FHWA, logical termini are rational end-points for a transportation improvement, and rational end-points for a review of the environmental impacts. In order to ensure meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated, the proposed action evaluated in an EA or EIS must meet the following criteria:[32]

- Begin/end project at points of major traffic generation, often intersecting highways. An example would be widening a two-lane roadway between two four-lane sections of highway.

- The termini selected should encompass an entire project. Dividing the project up into small individual projects is called "segmentation" and is not allowable under NEPA. The project may be constructed in segments, but the project studies should encompass the entire project, so that the effects of the project can be fully identified.

- Geographic boundaries are generally not suitable as logical termini. For example, ending a project at a county line is not logical when the substandard roadway continues beyond the county line to an adjacent town or city.

- For most projects, the choice of logical termini is likely to be obvious and non-controversial.

For a few major projects where other considerations are important, the termini must ensure the following:

- Environmental issues can be treated on a sufficiently broad scope to ensure that the project will function properly without requiring additional improvements elsewhere.

The project will not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

6.2 Development and Consideration of Alternatives

Once the purpose and need for a project is determined and the study area defined, planners and engineers must evaluate alternative ways in which the transportation problem(s) can be resolved. The CEQ regulations (40 CFR 1502.14) direct Federal agencies are to "…rigorously explore and objectively evaluate all reasonable alternatives…" that would avoid or minimize adverse effects of these actions upon the quality of the human environment.[33] The alternatives analysis is the heart of the environmental document and is central to NEPA's goal of excellent decision-making.

> The alternatives analysis provides an effective approach for identifying courses of action that can minimize or even avoid unnecessary future permitting requirements, thus expediting the project schedule.

The following sections discuss the three types of alternatives: no action, proposed action and the "reasonable range" of alternatives.

No Action Alternative

CEQ regulations (40 CFR 1502.14) require the agency to consider the existing situation without any proposed transportation improvements. Taking "no action" can have two meanings. The most common understanding is that the agency continues its current activities (e.g., maintenance activities) but does not implement the proposed action. The second interpretation is that no action means the agency simply takes no action of any kind. It can save time in the long-term to ensure there is agreement among the lead agencies on the approach before beginning the analysis.

> Properly described and evaluated, the No Action alternative can help gain public acceptance, if not approval, for an agency's controversial proposed action.

Although the No Action alternative might seem unreasonable, it must always be included in the analysis. The No Action alternative should thoroughly analyze the consequences of not moving forward with the proposed action. The No Action alternative provides the baseline against which to compare the proposed action and other alternatives, and can be used to validate the purpose and need. On the other hand, a thorough analysis of taking no action may lead to an understanding that the proposed action is not really necessary or justified especially when the impacts are great and the need is relatively minor.

Proposed Action and Alternatives Development and Refinement

The alternatives analysis can easily be the most costly part of the NEPA process and warrants close monitoring by the project manager. Ecceleston (1999) states in his guide for improving efficiency in the NEPA process, "In a time of austere budgets when agencies are being asked to do more with less, the ability to find innovative and alternative courses of action can be pivotal to an agency's success or failure in achieving its mission."[34] DOTs should take advantage of NEPA's mandate to evaluate reasonable alternatives, including those not within the jurisdiction of the lead agency (40 CFR 1502.14). It offers the opportunity to examine other courses of action that may be more cost effective, better meet the purpose and need, or avoid or minimize impacts and the associated costs of mitigation.

> "[T]he documents *shall* be written in plain language so that decision-makers and the public can readily understand them."
>
> *40 CFR 1502.7*

The "proposed action" is directly linked to the identified purpose and need and should address the transportation problem(s) and achieve the goals and objectives therein. In describing the

proposed action, authors often attempt to incorporate all available technical data to validate the need for the project. As the NEPA regulations (40 CFR 1502.7) explicitly state, "The documents *shall* be written in plain language so that decision-makers and the public can readily understand them." Material that is relevant to the decision to be made and necessary to support the conclusions may be placed in an appendix or retained in the project files but must be readily available to the public upon request.

The alternatives analysis is the place in the document to explain how the considered range of alternatives meets the purpose and need. Care should be taken that the purpose and need statement is not so narrowly drafted that it unreasonably points to a single solution. Additionally, the analysis should consider and discuss alternatives at a comparable level of detail to avoid any indication of a bias towards a particular alternative(s).[35] Project managers may want to keep this history in mind, though most SAFETEA-LU allows development of an alternative to a greater level of detail.

It can be helpful to consider the following questions.

Do the alternatives -

- Focus on moving people and goods, rather than vehicles?

- Include multimodal and intermodal opportunities, including for passengers and freight?

- Include demand management and operational efficiency strategies?

- Consider life-cycle costs?

- Avoid or minimize impacts to the natural, build, and human environments?

Do alignments -

- Minimize impacts to undeveloped lands or historic and cultural resources?

- Mitigate the impacts on the natural, built, and human environments, including opportunities for enhancement, where appropriate and affordable?

- Reduce the fragmentation of communities?

- Avoid disproportionately affecting low income groups?

- Consider regional and local land use plans?

- Include strategies to maximize public safety?

Design

- Does the proposed design promote traffic flow at fuel efficient speeds?

- Does the proposed design speed consider compatibility of the resulting geometry on the density and character of adjacent land uses?

- Does the proposed project fit the physical and community context in terms of aesthetics and noise, and pedestrian, bicycles, and local traffic circulation and access?

- Will the proposed geometric design features (horizontal/vertical alignment, lane widths, super elevation, open versus closed section, shoulder widths, median treatments) in relation to adjacent land uses induce desired travel speeds?

- Is there a likelihood that higher than minimally required design standards will induce higher than posted speed limits and lead to the need for more traffic calming measures?

- Does the proposed design speed consider compatibility of the resulting geometry on the density and character of adjacent land uses?

What Constitutes a Reasonable Range of Alternatives?

The term "reasonable" is defined by the CEQ as those alternatives that are "practical and feasible from a technical and economic stand point using common sense."[36] The identification, consideration and analysis of all reasonable alternatives or the reasonable range of alternatives is essential to the NEPA process and the goal of objective decision-making; however, many DOTs find it a challenge to determine what a "reasonable range" of alternatives is. With the intent to minimize the potential for a legal challenge, DOTs may incur cost and time unnecessarily analyzing unreasonable alternatives.

There is no average number of alternatives to evaluate; it depends on the characteristics of the individual project. The phrase "all reasonable alternatives" is not meant to imply that agencies must analyze an infinite or unreasonable number of alternatives.[37] In some instances, the range of reasonable alternatives may seem virtually unlimited. It may be helpful to keep in mind that a "reasonable" alternative meets the purpose and need of the project and does not have unacceptable consequences. Nevertheless, the analysis must meet the requirements to cover the full range of possibilities to permit a reasonable choice by the decision-makers.

The description of the alternatives should be a concise, clear, non-technical description of the project concept, location, termini, costs, and any features that help distinguish between the alternatives and allow the decision-maker to evaluate their comparative merits. Use maps, exhibits, plans or other visual tools to the extent feasible to improve comprehension and reduce verbiage.

The range of alternatives, including those identified during the planning and scoping processes relating to mode choice, alignments, and project scale are presented in the alternatives analysis. Then, the alternatives are screened on their ability to meet the purpose and need, avoid or minimize impacts, and address stakeholders' issues and concerns. Alternatives that do not meet these criteria are eliminated from further study with an explanation of why the alterative was determined to be unreasonable.

Careful screening to eliminate unreasonable alternatives will save the time and expense of doing engineering design on "throw away alternatives." However, it is important that the DOT provide the rationale and adequate documentation when eliminating alternatives that may be considered reasonable by outside stakeholders. The credibility of the rest of the analysis could be jeopardized if the conclusion is not supported by the analysis.

SAFETEA-LU – Range of Alternatives

FHWA's SAFETEA-LU guidance (Questions 36 and 37) clarifies the lead agencies' responsibility for developing the range of alternatives, and how agencies can satisfy the requirement that the agencies and public have an opportunity for involvement in the development of the range of alternatives. The required involvement opportunities for purpose and need and range of alternatives may be concurrent or sequential.

As early as practicable, the lead agencies must provide an opportunity for the public and agencies to have input in defining the range of alternatives. The form and timing of the involvement is flexible but it must be well advertised. After considering the input, the lead agencies decide on the range of alternatives for analysis. The opportunity for involvement must be provided prior to the lead agencies' decision regarding the range of alternatives to be evaluated in the NEPA document. The lead agencies' decision on the range of alternatives and their considerations in making that decision should be documented and shared with participating

agencies to ensure that any disputes are surfaced as early as possible.

Guidance for Developing Alternatives

AASHTO's Practitioners Handbook [Defining the Purpose and Need and Determining the Range of Alternatives for Transportation Projects](#)[38] includes recommendations for defining the purpose and need for transportation projects and provides the background for SAFETEA-LU requirements.

Selecting the Preferred Alternative

Selection of the preferred alternative is based on a comparison with the purpose and need, goals and objectives for the project and the impact analysis for the range of alternatives. The decision must be neutral and objective with regard to all alternatives and cannot be slanted to support the Preferred Alternative over other reasonable and feasible alternatives. The Preferred Alternative, if known, can be identified in the draft EIS (DEIS), and it *must* be identified in the final EIS (FEIS).

Compare the alternatives by summarizing how they differ in regard to both their resource impacts and their achievement of project objectives. Consider the following questions:

Do the criteria to determine the preferred alternative include:

- Resource conservation (natural environment, habitat, and ecosystem impacts)?
- Environmental protection (environmental quality and health)?
- Community, social and economic impacts?
- Stakeholder involvement (public opinion)?
- Public safety?
- Local and regional land use policies?
- Impacts on the built environment (context sensitive design solutions, historic/cultural preservation)?
- Consideration of utility facilities sharing the same corridor as the transportation facilities?
- Enhancing alternative mode use?

In choosing the preferred alternative has (have):

- The study process been transparent to the public?
- The participating agencies/organizations worked collaboratively in an attempt to reach consensus?
- Has the preferred alternative been reviewed by construction and maintenance engineers for constructability and maintainability issues?
- Has the LEDPA been identified, if applicable?
- Has the alternative that avoids or minimizes impacts to Section 4(f) properties been identified, if applicable?

SAFETEA-LU – Preferred Alternative

SAFETEA-LU guidance (Questions/Answers 39-46) offers an opportunity for streamlining the process for developing the Preferred Alternative. Once the preferred alternative has been identified, in accordance with CEQ Regulations (40 CFR 1502.14), it may be developed to a higher level of detail than the other alternatives. The most likely scenario is that the DEIS would identify the preferred alternative but treat it no differently than the other alternatives. Then, between the DEIS and FEIS, the lead agencies would develop the alternative to a higher level of detail to facilitate development of mitigation measures or concurrent compliance with other laws. Applied appropriately, this provision will be an effective tool for achieving the concurrent reviews called for in SAFETEA-LU (Question/Answer 60). The lead agencies must first determine that development of the alternative to a higher level of detail will not prevent the lead agencies from making an impartial decision on the final course of action. As always, the comparison of alternatives has to be done in a fair and balanced manner and not result in "pro forma" treatment of alternatives other than the preferred alternative.

6.3   Affected Environment

The Affected Environment section provides information on the existing resources and condition of the environment, and provides the baseline information on the project study area and sets the context for developing alternatives and assessing the potential impacts.

This section should focus on the important issues identified in scoping, and succinctly describe the environment of the areas to be affected. The descriptions should be no longer than necessary to understand the potential effects of the alternatives. Agencies should avoid needless bulk in descriptions and concentrate effort and attention on important issues. Verbose descriptions of the affected environment are themselves no measure of the adequacy of an environmental impact statement (40 CFR 1502.15).

The Affected Environment section should discuss, commensurate with the importance of the potential impacts, the existing social, economic, and environmental settings surrounding the project. It should also identify environmentally sensitive features in the project corridor.

Data sources for background information may include literature reviews, maps or GIS information, previous surveys, and information provided by the resource agencies. For most projects, this information will need to be supplemented with field studies. The FHWA *Environmental Review Toolkit* website provides excellent guidance for gathering data for the various resources. The needed supplemental studies should be started early in the process as some studies may be restricted to specific seasons.

To ensure the DOT is collecting the right data and not more data than is necessary, it is important to include the resource agencies in these decisions and field surveys. Input from the environmental specialists and resource agencies and the findings from the initial field review should be used to refine the project schedule and budget, if necessary. This is also a good opportunity for the agencies to identify their concerns early and identify avoidance and minimization alternatives before the DOT expends time and money on engineering design. Proactive coordination with the resource agencies at this stage can save valuable time by avoiding surprises for both the DOT and the agencies later in project development.

Another measure to improve efficiency is to incorporate material by reference when the effect will be to cut down on the bulk without impeding agency and public review. The incorporated material is cited and briefly summarized. Material based on proprietary data not available for public review shall be included in the report (40 CFR 1502.21).

The Affected Environment section and the Impact Analysis (also referred to as Environmental Consequences) section are often combined in a single section for ease of reading.

6.4 Environmental Consequences

Conducting an accurate impact assessment is central to NEPA's purpose of fostering excellent decision-making. The Environmental Consequences section forms the scientific and analytical basis for the comparison of alternatives. It describes the impacts of project alternatives on the environment and documents the methodologies used in evaluating these impacts. This section should describe in detail both the impacts of the proposed action that cannot be avoided and the potential measures that could be taken to mitigate these impacts.

> To the extent the agency can avoid impacts or include mitigation in the proposed action or the alternatives, the less time is spent on analyzing, designing, and permitting mitigation actions.

Mitigation must be considered for all impacts, regardless of their significance. Environmental impacts should be discussed in terms of their context and intensity, and may be adverse or beneficial.

As with development of the Affected Environment, the planning and scoping process will help identify the resources of most concern and those that are irrelevant or of minor concern. The analysis should be tailored accordingly. NEPA distinguishes three types of effects: direct, indirect and cumulative.

- **Direct effects** are caused by the proposed action and occur at the same time and place (40 CFR 1508.8).

- **Indirect effects** are caused by the proposed action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include those related to induced changes in patterns of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.98) and now, in some cases, climate change. "Reasonably foreseeable" does not include speculative analysis but the agency's administrative record should document impacts that have been considered but dismissed as speculative.

- **Cumulative effects** result from the incremental impact of the proposed action when it is added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts could result from individually minor, but collectively significant, actions that take place over time (40 CFR 1508.7). The cumulative analysis is the most challenging aspect but it is also the most useful for decision-makers to balance decisions with environmental impacts, especially in respect to long-term planning.

Cumulative effects analyses are especially challenging and there is no single agreed upon approach uniformly accepted by all agencies. In particular, practitioners find that determining the temporal and spatial boundaries to evaluate past and reasonably foreseeable actions can be difficult. WSDOT developed their *Guidance for Preparing Cumulative Impact Analyses* jointly with FHWA and the Environmental Protection Agency (EPA). Drawing upon FHWA, CEQ and other DOT resources, WSDOT designed their guidance to provide practitioners an efficient, consistent, legally defensible, and logical process for preparing cumulative impact assessments. WSDOT continues to refine their guidance but it provides a well thought out, comprehensive model that other DOTs can draw upon in developing or improving their own process.

The guidance presents an eight-step process that includes:

- **Identify the resources to consider in the impact analysis** that includes those resource areas for which the project could cause direct or indirect impacts.

- **Define the study area for each resource**. The spatial (geographic) and temporal (past and future) boundaries are identified based on consideration of public and agency input at scoping, the project, and how other important resources fit in. There are no predetermined time frames. "Past" and "future" years are based on providing a reasonable context for the resource. Geographic boundaries will vary by resource. Environmental resources are often bounded or demarcated according by political or jurisdictional boundaries but the natural environment often crosses these boundaries. Boundaries should limit the analysis to the point at which the resource is no longer significantly affected or of interest. Input from the public and agencies at scoping can be invaluable in helping to determine both the time frame for considering past actions and the area of influence for the impacts. The rationale for selecting the temporal and spatial boundaries should be documented.

- **Describe the current status/viability and historical context for each resource**. This step begins to "tell the story" of the resource by: A) describing the current health, condition, or status of the resource within the resource study area and B) provide historical context for understanding how a resource got to its current state.

- **Identify direct and indirect impacts of the project that contribute to a cumulative impact**. The analysis should be conducted within the context of environmental resources, ecosystems, and human communities. If the project does not have a direct or indirect effect on a resource, it cannot have a cumulative effect on that resource. Not all resources directly impacted by a project will require a cumulative analysis; this is determined on a case-by-case basis, generally as part of early coordination or scoping.

> A cumulative effects analysis should 'count what counts' and not produce superficial analyses or a long laundry list of issues that have little relevance to the effect of the proposed project or the eventual decision.

- **Identify other current and reasonably foreseeable actions.** It can be difficult to discern "probable" from "possible" but according to CEQ, "a cumulative effects analysis should 'count what counts' and not produce superficial analyses or a long laundry list of issues that have little relevance to the effect of the proposed project or the eventual decision." "Probable" impacts must be considered. The agency determines "what counts" in consultation with appropriate planning and resource agencies.

- **Identify and assess cumulative impacts**. This step includes a review of the information gathered to assess the cumulative impacts and draw conclusions about the cumulative impacts to resources considering the context and the intensity of the impact. The analysis should be based on an understanding of cause-and-effect relationships. For example, how do impacts to water quality affect wildlife habitat.

- **Document the results**. Describe the analyses, methods or processes used, explain the assumptions and summarize the impacts.

- **Assess the need for mitigation**. Mitigation measures to address cumulative impacts are often beyond the jurisdiction the agency and there is no requirement for an agency to mitigate for cumulative impacts. Nevertheless, impacts need to be disclosed and all avoidance and minimization measures that are planned or in place should be considered.

As a matter of policy, FHWA supports reasonable levels of mitigation (including avoidance and minimization) for indirect and cumulative impacts. This could include implementation of access management, funding of local land use planning capacity so local governments can make better decisions to limit adverse indirect impacts, and purchases of critical habitats or buffers.[39]

Impact Analysis

Consider the following questions when completing the impact analysis.

- Does analysis and evaluation include equity, environmental impacts, and effectiveness?

- Does analysis evaluate the degree to which alternatives address the problem?

- Do the benefits outweigh the negative effects, and justify the cost?

- Does analysis evaluate whether the benefits and costs are distributed equitably? Do alternatives avoid disproportionate impacts to low income groups? Are pricing policies equitable?

- Does analysis evaluate financial feasibility?

- Does sensitivity analysis allow the testing of different assumptions and forecasts to see how outcomes would change?

- Is the presentation of information adequate in terms of facilitating trade-off analyses and consensus building?

- Are sustainability and environmental stewardship key factors in deliberations leading to plan approval?

- Is the plan approval process transparent and open to interested stakeholders?

- Are sustainability and environmental stewardship objectives reflected in developing short-range programs?

- Do project priority-setting criteria adequately reflect sustainability-related objectives?

- Do system-monitoring parameters include indicators related to environmental stewardship and sustainability?

- Is there a post-completion process in place to measure overall effectiveness of proposed plan alternative?

Water Quality and Stormwater Management Considerations

- Can the location or overall design of the alternative be modified to reduce or eliminate adverse water quality and stormwater impacts without unacceptable degradation of functionality?

- Are there opportunities to enhance wetlands or other aquatic habitats?

- Does the project alternative avoid adversely affecting downstream uses?

- Have flooding issues (upstream and downstream) been considered?

- Does the project avoid sensitive waterways and aquifers?

- Does the project protect drinking water sources?

- Does the project offer opportunities for aquifer recharge?

- Has pollution control been provided?

- Has a risk based approach been adopted?

- Have alternatives to watercourse diversion been considered?

- Have erosion and sedimentation issues been considered?

- Porous surfacing to attenuate run-off?

- Have water quality permit requirements/mitigation been included?

Noise Considerations

- Can the location or geometric design of the alternative be modified to reduce or eliminate adverse noise impacts without unacceptable degradation of functionality?

- Will impacts to sensitive receptors in the project vicinity be mitigated?

- Have noise mitigation measures (barriers, berms, receptor improvements, and landscaping) been investigated where they are warranted (and evaluated for effectiveness and cost effectiveness, etc.)

Air Quality Considerations

- Can the location or geometric design of the alternative be modified to reduce or eliminate adverse air quality impacts without unacceptable degradation of functionality?

- Will impacts to sensitive receptors in the project vicinity be mitigated?

- Does the project seek to improve air quality by reducing congestion?

- Can vegetation be used to create a buffer zone and absorb pollutants?

- Does the geometric design include sufficient lane and shoulder widths to enable future maintenance and resurfacing activities to take place with minimal impacts to traffic flow (which could cause traffic disruption and potentially increase air pollution)?

- Are there operational measures (e.g., incident management, signal timing improvements, etc.) that can improve traffic flow and air quality?

Biological Resource Considerations

- Have partnerships with resource agencies and state and local conservation organizations been explored, to identify opportunities to further conservation objectives in the project area or for affected resources, elsewhere in the ecoregion?

- Can the location or geometric design of the alternative be modified to reduce or eliminate adverse biological impacts without unacceptable degradation of functionality?

- Have wildlife linkage areas been assessed? Do linkage considerations address changing habitat locations with rising temperatures and other effects of climate change?

- Have provisions been made for wildlife to cross the road safely (e.g., underpasses, culverts, "green bridges", eco-ducts, tunnels, etc.)?

Cultural Resources

- Have historic and paleontological resources been assessed and protected?

Section 4(f)

- Have impacts to public and private historical sites, publicly owned parks, recreational areas, and wildlife and waterfowl refuges been avoided?

Visual Impacts, Aesthetics

- Can aesthetics be improved through a context sensitive design approach?

- Are town gateways appropriate for the land use character and form?
- To the extent possible, do highway facilities reflect the character of adjacent communities (e.g., art on noise barriers)?

<u>Utilities, Staging Areas, and Borrow Areas</u>

- Have the existing utilities been identified and the environmental impacts of the proposed alternatives been quantified?

SAFETEA-LU – Impact Analysis Methodologies

Many agencies have difficulty determining or coming to agreement on the methodology for assessing impacts and feel that the requirements are a moving target. Methodologies can vary from region to region and even person to person within the same resource agency, except for those few resource topics that have widely accepted methodologies such as a noise impact assessment. As discussed below, the most effective approach is to work collaboratively with the resource agencies early in scoping to identify the methods most acceptable for evaluating resource impacts. Document the results of the methodology agreements in writing.

FHWA's [SAFETEA-LU guidance](#) (Question/Answer number 38) clarifies the requirements for determining methodologies for the analysis of alternatives, in collaboration with participating agencies.

Consensus is not required, but the lead agencies must consider the views of the participating agencies before making a decision on a particular methodology. After the lead agencies have collaborated with the participating agency on the methodologies and level of detail, the lead agencies will make the decision on the methodology and level of detail to be used. If the lead agencies do not agree, then they must work out their differences because progress on the methodologies and level of detail, and on the analyses that depend on these decisions is stalled until the lead agencies agree.

Given the track record of interagency disagreements over methodology late in project development, the lead agencies should aggressively use the scoping process as described in 40 CFR 1501.7 and in SAFTETEA-LU to solicit public and agency input on methodologies and to reach closure on what methodologies will be used to evaluate important issues. This approach is particularly important on issues, such as the analysis of indirect and cumulative effects, for which questions of methodology are very open.

As part of the scoping process, the lead agencies should communicate decisions on methodology to the participating agencies with relevant interests or expertise soon after they are made. The lead agencies may define a comment period on the methodology and in most cases can reasonably assert that comments on methodology received much later in the process (e.g., after issuance of the DEIS) are not timely and will therefore not be acted upon. Exceptions should be based on significant and relevant new information or circumstances. The results of the collaboration on methodologies and level of detail should be communicated to participating agencies in written form so that any objections can be surfaced as early as possible. If a cooperating or participating agency has permit or other approval authority over the project, it would be useful, though not required, for the lead agencies and the permitting agency to jointly develop methodologies that can be utilized for all applicable environmental reviews and requirements.

"Significant" Impacts

Determining the potential significance of an impact is complex and may be hard to pin down. Obviously, there are no specific metrics for defining when impacts to a resource cross a

threshold of significance. The regulations do not define "significance" but state that the impacts must be considered in both intensity and the context of the impact. It is the responsibility of the decision-maker to consider the analysis and determine whether an impact is significant.

The regulations state: "… the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality (40 CFR 1508.27)." The environmental baseline described in the Affected Environment section describes the baseline against which the impacts of the potential actions are measured and can have an important bearing on the agency's conclusion regarding significance. The intensity is a measure of degree or severity of an impact. The regulations (40 CFR 1508.27) consider "intensity" as:

- Impacts that may be both beneficial and adverse

- The degree to which the proposed action affects public health or safety

- Unique characteristics of the of the geographic area

- The degree to which the effects on the human environment are likely to be highly controversial

- The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks

- The degree to which the action may set a precedent for future actions with significant effects

- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts

- The degree to which the action may adversely affect districts, sites, highway structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

- The degree to which the action may adversely affect an endangered or threatened species or its critical habitat as determined under the Endangered Species Act.

- Whether the action threatens a violation of Federal, state or local law or requirements imposed for the protection of the environment

It should be noted, however, that FHWA policy (*Technical Advisory 6640*) does not require a determination of the "significance" of impacts and does not consider it a threshold for compensation of project impacts.

6.5   Mitigation and Permitting

Agencies must identify and evaluate reasonable mitigation measures not included in the proposed action. The regulations recognize five distinct types of mitigation measures (40 CFR 1508.20):

- Avoiding the impact altogether by not taking an action or parts of an action

- Minimizing impacts by limiting the degree or magnitude of the action and its implementation

- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment

- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action

> Effective mitigation starts at the beginning of the NEPA process, not at the end.

- Compensating for the impact by replacing or providing substitute resources or environments

This ordered approach to mitigation is known as "sequencing" and involves understanding the affected environment and assessing transportation effects throughout project development. Mitigation must be included as an integral part of the alternatives development and analysis process.

Beyond the CEQ requirements to evaluate alternatives to avoid or minimize impacts to the environment, there are other regulations that require consideration of "avoidance" alternatives. Specifically, Section 4(f) of the Department of Transportation Act of 1966, the Executive Orders on Wetlands (EO 11990), Floodplains (EO 11988), and Environmental Justice (EO 12898), and the US Army Corps of Engineers' Section 404 (b)(1) guidelines, require agencies to develop alternatives that would avoid or minimize impacts.

A comprehensive mitigation plan contains five essential ingredients:

- Specific and detailed measures

- Specific schedule

- Appropriate funding

- Measurable performance criteria

- Assignment of responsibility for implementation

Mitigation does not normally include methods or technology considered to be standard engineering practice or required by law or regulations. The analysis must do more than simply identify mitigation measures; measures must be analyzed for their effectiveness in reducing potential impacts.

FHWA's mitigation policy (23 CFR 771.105(d)) states that measures necessary to mitigate adverse impacts will be incorporated into the action and are eligible for Federal funding when the Administration determines that:

- The impacts for which the mitigation is proposed actually result from the Administration action; and

- The proposed mitigation represents a reasonable public expenditure after considering the impacts of the action and the benefits of the proposed mitigation measures. In making this determination, the Administration will consider, among other factors, the extent to which the proposed measures would assist in complying with a Federal statute, EO, or Administration regulation or policy.

Mitigation commitments in the Finding of No Significant Impact (FONSI) or the ROD are legally binding and the decision-maker is responsible for ensuring that the funds and resources are available and that the measures are technically feasible.

6.6 Public Involvement - A Clear, Open, Transparent Process

Often, the process through which a project is developed is as important as the design standards employed. The regulations (40 CFR 1506.6) state that:

- Agencies shall make diligent efforts to involve the public in preparing and implementing their NEPA procedures.

- Provide public notice of NEPA related hearings, public meetings, and the availability of environmental documents to inform those persons and agencies who may be interested or affected.

SAFETEA-LU – Coordination Plan

SAFETEA-LU re-emphasizes the importance of public involvement in the NEPA decision-making process. After project initiation, SAFETEA-LU (Questions/Answers 47-49) requires agencies to establish a plan work coordinating public and agency participation and comment during the environmental process. The lead agencies are encouraged to consult with participating agencies so they do not set expectations that require a commitment of resources the participating agencies cannot provide. The purpose of the plan is to document interaction with the public and other agencies and has the potential to expedite and improve environmental review. The plan may be as detailed as the agency needs, but should include coordination at key points in the decision-making process, such as:

- Notice of intent publication and scoping activities
- Development of purpose and need
- Identification of the range of alternatives
- Collaboration on methodologies
- Completion of the DEIS
- Identification of the preferred alternative and the level of design detail
- Completion of the final environmental impact statement
- Completion of the ROD
- Completion of permits, licenses, or approvals after the ROD

Both SAFETEA-LU and CEQ (40 CFR 1501.8) strongly encourage inclusion of a project schedule in the coordination plan. The schedule must be prepared in consultation with each participating agency, but concurrence is not required. The lead agencies can incorporate the coordination plan into a MOU that is applicable to a single project of to a category of projects.

As described earlier, SAFETEA-LU requires DOTs provide an opportunity for public and agency involvement in the development of the purpose and need statement and the range of alternatives.

The project development process outlined in this Guidebook defines the need for early identification of issues and alternatives, open and continuous involvement with project constituents, and a clear decision-making process. This process should ensure that community values, natural, historic and, cultural resources and transportation needs are fully considered throughout the planning, design, and construction phases of a project. A clear and consistent public involvement process is important for a number of reasons. The most significant are:

- To encourage early planning and evaluation so that project needs, goals and objectives, issues, and impacts can be identified before significant funds and time are expended
- To ensure context sensitivity through an open, consensus-building dialog with project constituents
- To achieve consistent expectations and understanding between project proponents and those entities who evaluate and prioritize projects (including the DOT and MPOs)
- To facilitate efficient allocation of resources based on pre-established project selection criteria and consistency with local, regional, and statewide priorities

An effective process helps achieve projects that respect the values of the community and the natural and built environment, while meeting the transportation needs. The FHWA and AASHTO

clearly establish the importance of a sound project development process for achieving context-sensitive highway solutions in their publications *Flexibility in Highway Design* and *A Guide to Achieving Flexibility in Highway Design*.

Public Outreach

Public outreach should occur throughout the planning and project development process to ensure that the project continues to meet its intended purpose, benefits from input and feedback from interested citizens, local and regional groups, and elected officials, and maintains strong support. Public outreach is integrated into every step of the project development process to ensure a role for the public to help shape the project that emerges from the process. It is particularly important to provide opportunities for public outreach early in project planning. SAFETEA-LU mandates that when the lead agencies seek comment by the public or participating agencies at any phase except the DEIS, the comment period is not to exceed 30 days, unless the lead agencies, project sponsor, and all participating agencies agree to a different comment period. While 30 days is the maximum, shorter time periods may be appropriate based on the volume and complexity of the materials.

> The objective of engaging the participating agencies is to identify and resolve issues as early and quickly as possible.

SAFETEA-LU – Participating Agencies

SAFETEA-LU created a new category of involvement in the environmental review process termed "participating agency". The intent of the new category is to encourage governmental agencies at any level with an interest in the proposed project to be active participants in the NEPA process and provide input at key decision points. Federal, state, tribal, regional and local government agencies that may have an interest in the project should be invited to serve as participating agencies. Nongovernmental organizations and private entities cannot serve as participating agencies. The lead agencies must make a good faith effort to identify and involve other interested agencies. The roles and responsibilities of participating agencies include:

- Participating in the NEPA process starting at the earliest possible time, to provide input on the purpose and need, range of alternatives, methodologies, and the level of detail for the analysis of alternatives

- Identifying, as early as practicable, any issue of concern regarding the project's potential environmental or socioeconomic impacts

- Providing meaningful and timely input on unresolved issues

- Participating in the scoping process

The project manager should remember that accepting designation as a participating agency does not indicate project support and does not provide an agency with increased oversight or approval authority beyond its statutory limits; i.e. nullify other laws participating agencies are responsible for implementing.

Identifying Project Constituents

Early in the project development process, the project manager should consider the public support for the project and the constituency that it serves. Project constituents are groups and individuals that are involved in, have an interest in, or are affected by a proposed project. They can either be formal participants in the process, or can be represented by other participants in

the process. Different types of projects involve different constituents, and different levels of planning and review.

Project constituents include some or all of the following entities:

- Federal Highway Administration
- DOT and Metropolitan Planning Organizations
- Regional Planning Agencies
- Regional Transit Authorities
- Transportation Providers
- State and Federal Regulatory Agencies
- Other State Authorities
- Local Elected Officials, Public Works Departments, Boards, and Commissions, including Conservation Commissions
- Facility users (commuters, residents, visitors by all modes)
- Others expressing an interest
- Neighbors and citizen groups

- Independent Living Center(s)
- Regional watershed or river management councils
- Private area businesses
- Local emergency responders
- Utilities (including railroads)
- Special interest groups
- Tribal governments
- Advocacy and interest groups (such as local pedestrian or bicycling committees, trucking associations, preservation groups, etc.)
- Municipal commission(s) on accessibility
- Participating Agencies

At a minimum, the DOT should contact the appropriate local planning and public works staff, planning commission, conservation commission, and major local property owners in the vicinity of the project area to help determine initial concerns and issues. The DOT should confer with municipal officials to determine which property owners may have legitimate issues that the project should address. This effort will help identify important local groups such as neighborhood associations, business associations, historical societies, recreation and open space committees, transportation providers, and others who should be informed of the project. It is better to be as inclusive as possible early in the project development process to allow the public to participate and be afforded an opportunity to contribute to the decision-making process for the project. It should also be made clear to all those attending how comments will be treated and how any expected follow-up will be handled.

Identifying the likely parties that may have an interest in the project at the beginning of the project development process helps the agency tailor the public outreach program appropriately. The project proponent should define a public participation plan at the outset of each step of the project development process.

The level of interest and role of the public varies widely by project type and complexity. Different types of projects are likely to elicit different levels of community, resource agency, and local board interest. These project types are grouped into system preservation projects, and system improvement or expansion projects with guidance provided on the appropriate level of public outreach, as explained further in the following paragraphs.

Public notice procedures are an important part of the NEPA process. The project proponent should carefully consider the best-suited approach to public outreach, depending upon the

complexity of the project. Some general approaches to increase awareness of a project and solicit input are described below:

- **Notification of Abutters** —For all projects, other than routine maintenance, DOTs should, at a minimum, notify abutters of the construction program anticipated and its potential impacts to property and/or operations. Notification can range from informal means such as neighborhood flyers or posters, newspaper notices, or more formally done by certified mail.

- **Notification of Utilities** — The DOT should notify utilities of the construction program anticipated and its potential impacts to their services or operations. It is important to notify utilities even for routine resurfacing and rehabilitation projects to coordinate any planned utility work. This is especially true for an overlay, since pavement life is shortened considerably following a utility cut.

- **Community Notification** — As projects become more complex, disruptive, and of longer duration, notification should be made to the community as a whole using an array of public outreach tools. This community notification helps to increase knowledge of the project and its potential construction-related impacts. Beyond simple notification, the proponent should actively involve abutters, specific local interest groups, and utilities to get a good cross-section of people to participate.

- **Early Involvement of Local Boards and Commissions** —The DOT should consider involving local boards and commissions at the outset of the project. This involvement can help the agency identify issues the project is likely to face, and help them gauge the type of additional outreach activities that may be most appropriate if the project proceeds. Outreach to local boards and commissions can also be helpful for complex maintenance and resurfacing projects. It is safer to notify all municipal departments/boards of a project's scope before much design work is started to minimize later concerns or needs for project changes.

- **Early Local Issues Meeting** — An early local issues meeting is important for projects where transportation facilities are being expanded, replaced, or substantially modified. The meeting should be widely advertised, as discussed below. This meeting provides a forum for project constituents to make their concerns known before a course of action is determined. For straightforward projects, this early local meeting, coupled with later opportunities for public hearings during design and permitting, may be sufficient. For more complex projects, or for projects that cover multiple jurisdictions, several early local issues meetings may be necessary.

- **Public Forums or Hearings at Several Stages of Planning and Design** — As project complexity continues to increase, the public participation should include several opportunities for public involvement during the planning and design phases. These opportunities would be in addition to the SAFETEA-LU requirements for public and agency input in the purpose and need and range of alternatives discussed earlier. Targeted mailings can be used to generate interest and ensure that concerned parties are contacted. Key milestones where public involvement is especially important include alternatives analysis during the planning process, at key design milestones, or if the project elements change substantially due to increasing refinement of the design. Detailed meeting minutes are recommended for each session.

- **Active Communication about Project Progress** — In addition to interactive public forums, active communication about project progress is helpful for maintaining consensus and keeping project constituents informed about the project status. Many DOTs use their websites for such project information.

- **Formation of an Advisory Task Force** — An advisory task force of project constituents can be particularly helpful for maintaining involvement from a consistent group of individuals, representing a cross-section of interests in the project. This formalized type of public outreach is generally reserved for more complex projects with a wide range of alternatives, benefits and potential impacts. Typically, task forces are advisory bodies that offer input to the process and suggest recommendations. In almost all cases, formation of an advisory task force does not replace the need for the other public outreach approaches.

Tools for Public Outreach

Many aspects of public outreach associated with transportation projects require different tools and approaches including:

- Informing constituents of a potential project

- Active participation of project constituents in planning and design

- Formal public meetings and hearings

- Communication about the progress of a project

Within each of these aspects, various outreach tools are available which serve different purposes and target different audiences. Most tools are applicable throughout the project development process; some may be most fruitful at different points in the process.

The first stage in public outreach is to make people aware of a potential project. Legal notices alone are ineffective at informing the community about upcoming project meetings. The project proponent should consider using multiple additional ways to communicate the opportunity to participate in the transportation project development process, such as:

- Local newspaper articles or editorial letters

- Notices to local boards, committees, and local or statewide advocacy groups

- Posters at civic buildings or churches, or in neighborhoods

- Local cable television community event calendars

- A community website posting or community-wide mailing

- Press releases to media outlets

- A community-wide meeting notice or newsletter mailing (or email)

- Flyers to project abutters

Public hearings are required for EISs and may be beneficial for complex or controversial EAs. Public hearings are legally recognized formal meetings held at particular stages of the project development process. If a Federal or state environmental document is required, the public hearing is held after the document is available for public review. SAFETEA-LU mandates that the DEIS comment period not exceed 60, unless a different comment period is established by agreement of the lead agencies. Some environmental or resource agency permits or clearance processes also require public hearings. All public meetings and hearings should be held in facilities that are fully accessible for people with disabilities, and notices about these meetings should use the International Symbol of Accessibility to indicate that the location is accessible. Meeting notices should indicate that handout materials can be made available in alternative formats—Braille, large print, and/or audio cassette—as well as other accommodations (sign language interpreters, communication access real time translation (CART) reporters, etc.), along with specifics on how to request these accommodations. If alternate language handouts

are needed, the Project Manager should anticipate this and provide such materials at the meeting.

Formal environmental and design hearings are sometimes ineffective in eliciting community concerns and addressing individual issues. Beyond the required public hearing, other ways to communicate with those interested in or affected by projects include:

- **Public Meetings** — informal gatherings of designers, officials, and local citizens to share and discuss proposed actions. These meetings provide an opportunity for informal, less structured conversations about a project, the design elements, and its potential benefits and impacts.

- **Open Houses** —mechanisms for interested parties to gather more detailed information on a project. Open houses facilitate the discussion of particular details of interest to individuals more effectively than traditional hearings or public meetings.

- **Workshops or Charrettes** —smaller groups that facilitate problem solving around design issues for which several options are available and the best solution is unclear.

Other Communication Tools that are effective in providing information to the public and soliciting their input include:

- **Newsletters** — provide a forum for meeting notification and periodic updates on project status and decisions. Newsletters can either be traditionally mailed or electronically transmitted.

- **Websites** — allow frequent updates of project status, enabling interested parties to review materials on their own schedule, and facilitate correspondence of questions and responses. Project websites should be designed to meet access standards for electronic media as defined in state and/or Federal regulations.

- **Project Information Boards** —illustrate project details and provide contact information at the project site facilitating involvement in other forms of outreach.

Planning Your Meeting

Successful public meetings require good advance communications and coordination with community leaders, elected officials, the regional planning agencies, and the DOT beforehand in order to set the agenda and establish the framework for appropriate follow-up and continued communication. The project manager should work closely with local and regional officials on meeting logistics, including location, time, and format. Obtaining a community consensus on the problem requires proactive public involvement beyond conventional public meetings at which well-developed design alternatives are presented for public comment. If a consensus cannot be reached on the definition of the problem at the beginning, it will be difficult to move ahead in the process and expect consensus on the final design. Public comments and the DOT's responses, agreements reached and commitments made should be documented for the Administrative Record.

Guidance for Conducting Public Involvement

In December 2007, CEQ published *A Citizen's Guide to the NEPA. Having Your Voice Heard* to help citizens, private sector applicants, members of organized groups and others understand the NEPA process and how they can participate in Federal agencies' environmental reviews and decision-making process.

FHWA's *Public Involvement Techniques* is an interactive website that provides the practitioner with guidance on designing an effective public involvement plan. The website also steps the practitioner through a variety of techniques for developing a full public involvement program for

MPOs as well as for individual projects, case study examples, and other technical and training resources.

WSDOT's *Environmental Procedures Manual* provides an example of a comprehensive Public Involvement Plan. The suggested plan elements include:

- Project stakeholders and key messages.

- List of proposed involvement activities and methods.

- Special issues and areas of concern.

- Targeted outreach to solicit comments from those traditionally underserved i.e., minority, low-income, disabled, elderly and limited proficiency in English).

- Methods to track, consider, and incorporate comments into the decision-making process.

- Major project decision milestones and scheduled environment process goals for each task.

- Program for monitoring, evaluating, and restructuring the plan when necessary.

- Personnel, time schedule, and costs for the plan.

- Process for documentation.

- Legal requirements and constraints.

6.7 Context Sensitive Solutions

The process principles of context sensitive solutions (CSS) help meet NEPA's objective for obtaining public input and understanding community needs, allowing the DOT to "....gain an understanding of the engineering issues that might affect a project's safety or constructability. This process also provides a forum for resolving conflicts in the early phases of a project, as part of initial alternative development, thereby reducing the likelihood that they will become larger project risks or fatal flaws during the formal environmental review."[40]

CSS has become a basic tenet of how most DOTs conduct project development. A sample statement of commitment from the Tennessee DOT (TDOT) outlines its CSS approach and explains how TDOT uses CSS:

> *TDOT uses CSS as a process to plan, design, construct, maintain and operate its transportation system in order to establish and achieve transportation, community and environmental goals. Context Sensitive Solutions balance safety and mobility, and the preservation of scenic, aesthetic, historic, environmental and other community values. CSS is a philosophy of doing business that impacts both the project development process and project outcomes.*

Key principles of CSS are:

- Balance safety, mobility, community and environmental concerns

- Seek stakeholder input early and continuously

- Use an interdisciplinary team tailored to the specific needs of the project

- Apply the flexibility inherent within national design standards

- Incorporate aesthetics as an integral part of design

Using a CSS approach, a DOT seeks to achieve consensus with a full range of stakeholders at key project development milestones, including problem identification, development of a project

vision, and development and assessment of project alternatives, through construction and maintenance.

The CSS approach begins in the project planning phase, even before the NEPA process is initiated, and continues through the environmental evaluation, design, construction, and maintenance and operations of a project. Large, complex projects and controversial projects may utilize citizen resource teams or focus groups. A citizen resource team is comprised of a representative group of project stakeholders familiar with the project area. The team members provide input to the DOT about project issues and concerns and convey project information back to their community members.

Early and on-going coordination with the public and resource agencies should be summarized in the environmental document. A detailed discussion of the public involvement that has been conducted throughout the project development process should be included in the chapter on agency coordination and public involvement.

6.8 Legal Sufficiency

Decisions resulting from NEPA litigation have concluded that Federal agencies must take a reasonable "hard look" at their proposals in light of available information, analysis, and the potential for environmental impacts in making informed decisions to implement an action or an alternative.[41]

Some NEPA project managers interviewed for this guide expressed concerns about the legal sufficiency review process. For example, legal sufficiency reviews -

- Impede efforts to improve readability

- Are unpredictable

- Offer conflicting advice

- Focus on typos and style of writing rather than substantive legal issues

- Slows down the process

- Are overly risk-averse

As the lead Federal agency, the FHWA has the legal responsibility to comply with the various laws, regulations, and Executive Orders as applicable to the NEPA study.[42] The legal sufficiency process is required by the CEQ regulations (40 CFR 1507) prior to the approval of the FEIS and is distinct from "prior concurrence" reviews. For extraordinarily complex or controversial projects, the legal sufficiency review should be initiated at the draft EIS stage or earlier.

The purpose of the legal sufficiency review is to ensure that the NEPA document will be sustained in federal court if the project is litigated. Legal sufficiency also addresses the role of litigation risks. Certain "minimums" must always be met, regardless of potential for litigation. If litigation is expected, attorneys will assess the likelihood of litigation, identify specific areas of litigation risk, offer suggestions for reducing risk, and assist decision-makers in weighing risks.

For NEPA project managers, it is important to note that not all "legal sufficiency" comments are created equal. Comments may address:[43]

- Compliance with applicable laws, regulations, Executive Orders, or Agency guidance

- The adequacy of supporting information related to the elimination of alternatives or Section 4(f) feasible and prudent alternative analysis

- The quality, clarity, and consistency of the writing. Overall, legal defensibility is enhanced by clear, logical organization; jargon-free writing; effective use of visuals; and "telling the story" of the project.

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According to Eccelston, the principal reasons courts have found EISs inadequate include:[44]

- Trivial treatment of indirect and cumulative impacts

- Sweeping conclusions unsupported by fact

- Vagueness in respect to important issues

- Internal contradictions

- Disregard for local land use planning requirements

- Failure to include sufficient information on impacts associated with reasonable alternatives

- Failure to make an unbiased comparison of alternatives with the proposed action

- Failure to adequately investigate mitigation measures

Red Flags

There are steps the NEPA project manager can take to reduce litigation risk and thus, reduce unnecessary delays in the legal sufficiency review process. Before submitting the NEPA document for legal sufficiency review, the project manager should ensure key elements have been addressed at the following process stages.

Purpose and Need

- Define the project purpose and need without too narrowly limiting the range of reasonable alternatives

- State project goals clearly and concisely

- Ensure consistency with local land use policies and goals

Alternatives Screening and Analysis

- Adequately explain the alternative development, screening, and evaluation process

- Ensure adequate consideration and analysis before eliminating alternatives

- Reconsider alternative screening decisions later in project development when new information becomes available

- Take into account regulatory factors such as Section 4(f) and Section 404 requirements when screening alternatives

Project Segmentation – The project must have logical termini independent utility, and not restrict consideration of alternatives for reasonably foreseeable transportation improvements.

Study Area Boundaries – The study area must be broad enough to account for all project impacts

Indirect and Cumulative Effects Analysis – The indirect and cumulative analysis can be one of the most challenging aspects of the process but it is often a target of litigation. Thoroughly

review and consider the issues in the project study area, particularly how they relate to land use, development and local planning goals.

Compliance with Procedural Requirements – Thoroughly document how the procedural requirements have been met for the National Historic Preservation Act Section 106, the Endangered Species Act Section 7 and other procedural processes.

Compliance with Substantive Requirements – Two common requirements include Section 4(f) and Section 404, both of which require specific findings prior to approval. For projects with these requirements, seemingly minor changes in wording can substantially affect perceived adequacy and legal defensibility. If there is any doubt about the adequacy of the analysis, seek input from legal counsel.

Response to Public Comments – Ensure the responses address the substantive issues, and the comments are consistently considered and adequately addressed.

Responses to Resource Agency Concerns – Courts often look to resource agencies as the subject matter experts and failure to respond to their concerns can present serious problems during litigation.

Accounting for New Information or Circumstances - Essential information related to the analysis and decision-making based on the most current information available, a particularly important for NEPA studies that are developed over a lengthy period.

It is also important for NEPA project managers to ensure products:

- Support your conclusions
- Explain your methods
- Provide back-up details
- Build a strong administrative record

The AASHTO-FHWA-private sector work group on legal sufficiency advocated involving attorneys early, especially in key decisions such as purpose and need. At least one DOT has retained a NEPA attorney on staff to help ensure the documents are legally sufficient before they submit their environmental documents to FHWA for legal sufficiency review, thus accelerating the review time.

 A robust scoping process, serious consideration of public and agency concerns, regulatory compliance and a well-written environmental document focused on the transportation problem(s) to be solved and avoiding or minimizing impacts to substantive environmental and cultural resources is key to reducing risks and minimizing legal sufficiency review times.

6.9 Preparing Quality Documents

AASHTO, the American Council of Engineering Companies and FHWA collaborated to produce a guide to improve the readability and functionality of NEPA documents prepared for transportation projects.[45] *Improving the Quality of NEPA Documents* outlined an approach for preparing clearly written, concise, and legally sufficient environmental documents. A workgroup of the three organizations conducted a survey of state DOTs, the engineering consultant community, and FHWA to assess the quality of NEPA documents. Their survey results were consistent with the findings in the surveys conducted for this guide.   FHWA and DOT project managers were nearly unanimous in their concerns about the ever-increasing length and complexity of NEPA documents and the time it takes to prepare them. Despite NEPA regulations and Federal laws such as the Transportation Equity Act for the 21st Century and SAFETEA-LU, and Executive Order 13274 that direct agencies to improve the timely delivery of

transportation projects, environmental documents continue to become more complicated in response to legal challenges, and public and agency requests for additional information and analyses.

The workgroup identified three core principals as the basis of quality documents:[46]

Tell the story of the project so that the reader can easily understand the purpose and need for a project, how each alternative would meet the project goals, and the strengths and weaknesses associated with each alternative. The document should provide a clear path of logic that links the alternatives, the affected environment, the impact analysis directly to the project purpose and need. The analysis should clearly support the conclusions and decisions.

Keep the document as brief as possible, using clear, concise writing; an easy-to-use format; effective graphics and visual element; and discussion of issues and impacts in proportion to their significance. Keep technical information and studies in the project files (available to the public, if requested) or in the appendices and cross- reference them in the main body of the document.

Ensure that the document meets all legal requirements in a way that is easy to follow for regulatory and technical reviewers. It can be a challenge to strike a balance between sufficient detail to ensure regulatory compliance with a concise, reader-friendly document. Some of the key steps outlined in the *Synthesis of Data Needs for EA and EIS Documentation – A Blueprint for NEPA Document Content* are reprinted below.[47]

- **Identify and Explain Key Assumptions**. The environmental document should identify key assumptions and explain why those assumptions were made.

- **Describe Methods Used to Develop Data**. For the document to be credible, the reader must be able to understand how the data were developed. This requires not only giving the name of the model but also how the model works, what type of information it provides and its limitations.

- **Use Effective Visuals to Present Key Results**. Visual aids are valuable in helping the lay person understand complex issues.

- **Do Not Just Summarize the Data, Analyze It**. The environmental document should explain what the data means and show the cause and effect relationships.

- **Document Compliance with Key Regulatory Requirements**. The NEPA process is used for achieving compliance not only with NEPA, but a range of other environmental laws related to air and water quality, and cultural and biological resources. The document should include a systematic review of the regulatory requirements and explain which are applicable, which are not, and how the applicable requirements have been met.

- **Provide an Overview of Major Project Issues**. The NEPA document should provide a summary of the major issues and explain how the issues were addressed. The summary should provide cross-references to other locations in the document where more detail is provided.

- **Systematically Review Data to Ensure Internal Consistency**. Inherent in complex, technical documents is the potential inconsistencies and contradictions. Inconsistencies between tables and text, discussions of the same issue in different sections, or between discussions that involve the same data can affect the credibility of the document.

Quality Assurance/Quality Control Reviews

NEPA Quality Assurance and Quality Control review often involves the following:

- Technical Specialist Review
- Internal Peer Review
- Supervisor Review
- Technical Editor Review
- NEPA QC Review
- FHWA
- Legal Review

An excellent overview of the role and importance of each is in the NEPA review and QA/QC process from the *Caltrans NEPA QA/QC process*. Before assuming FHWA responsibilities, Caltrans was required to institute comprehensive quality control programs, including an expanded Environmental Document Quality Control Program. Caltrans reports that these new procedures have helped to improve the processing of environmental documents, while also shortening review periods. Writing a quality document will require an interdisciplinary team of technical experts, writers, a technical editor and graphic designers. The NEPA project manager needs to take into consideration the elements required to produce a high quality and legally sufficient document when developing the project schedule and budget.

7 Project Management

The objectives of project management are to execute a project so that deliverables can meet scope requirements on budget and schedule, and at acceptable risk, and be of high quality. Many times, meeting of all of these competing project objectives requires skillful balancing throughout the project life cycle by the project manager. The greatest threat to project success from a procedural perspective is scope creep.

In addition to scope, budget, and schedule, it is extremely important that the project manager facilitates a discussion of the project risk and incorporate the outcome in a project management plan.

7.1 Risk Management: What is it? How to Approach it

Risk management is more effective near the beginning of any process, though the early project phases can be the most challenging because of the lack of project details. Risks are defined as uncertain events that have a positive or negative effect on at least one of the project objectives (scope, schedule, budget, quality). Risk management is the practice of dealing with project risk: the practice includes planning for risk, assessing risk, developing risk response strategies, and monitoring risk throughout the project life cycle.

According to FHWA, "Risk management processes, tools, documentation, and communication are less standardized than any other dimension of transportation project management.[48] Only a few state DOTs, including Caltrans and 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.

High impact/high probability risks may be tackled through avoidance, mitigation, or transference. A DOT's or an individual's tolerance for risk may diminish if a more certain outcome is preferred and more money is at stake. Common approaches to risk are described below:

- **Avoidance**—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 California's 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**—Reducing the probability or impact of a risk to an acceptable threshold. For example, in its S-curve reconstruction in downtown Grand Rapids, 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 short-grass prairie initiative, the 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**—Shifting the negative impact of a threat, along with the ownership of the response, to a third party. A similar example to CDOT's above occurs with North Carolina's Ecosystem Enhancement Program, funded by North Carolina DOT (NCDOT), which 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 DOT project on the Beltline interchange, Oregon DOT 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 offers great potential to streamline project development. Problems that arise on projects very frequently cause delay. Giving adequate attention to understanding, avoiding, minimizing, and mitigating risks in advance can avoid many problems, increasing the predictability of the project schedule and smoothness of the project development process. Conflicts avoided and trust built through these proactive methods also constitute "deposits in the emotional bank accounts" of the stakeholders involved.

In recent years, several state DOTs have demonstrated notable success at cost-effectively meeting performance objectives, despite rising costs and public expectations. The following select examples summarize some notable approaches.

Washington State's GIS Applications

WSDOT staff use the state's Environmental Workbench GIS to identify environmental risks and try to avoid and minimize such impacts early in the project development process. The Environmental GIS Workbench is a custom GIS application built to help WSDOT staff access over 60 layers of environmental or natural resource management data. The Environmental Information Program works with appropriate Federal, state and other agencies to maintain a collection of the best available data for statewide environmental analysis. This application is an ArcView extension that provides WSDOT staff with tools for locating transportation projects and displaying a wealth of environmental data themes for that location. While the best available environmental GIS data often has considerable limitations, it generally provides a good flag for likely environmental issues affecting project planning and can help identify opportunities to avoid or minimize impacts before the project progresses too far into design.

Florida DOT's Environmental Technical Advisory Teams

FDOT's Efficient Decision Making process, Environmental Screening Tool, and Environmental Technical Advisory Teams, staffed by resource agencies with FDOT funding is an even more evolved risk management approach, along these lines. While many DOTs are discouraged in duplicating ETDM by the extent of statewide investment in GIS data and all the negotiated thresholds developed as precursors for the framework, almost any state can duplicate WSDOT's approach.

Caltrans' Risk Planning

DOT project delivery performance is judged on quality, adherence to schedule, and being within budget. *Caltrans' Risk Management Handbook* outlines a process project managers can use to manage risk and meet project delivery goals.[49]

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. Potential risks to consider through project development include:

Environmental Risks to Consider as a Starting Point for Team Discussion

- Environmental analysis incomplete

- Availability of project data and mapping at the beginning of the environmental study is insufficient

- New information after Environmental Document is completed may require re-evaluation or a new document (i.e., utility relocation beyond document coverage)

- New alternatives required to avoid, mitigate or minimize impact

- Acquisition, creation or restoration of on or off-site mitigation

- Environmental clearance for staging or borrow sites required

- Historic site, endangered species, riparian areas, wetlands and/or public park present

- Design changes require additional Environmental analysis

- Unforeseen formal NEPA/404 consultation is required

- Unforeseen formal Section 7 consultation is required

- Unexpected Section 106 issues expected

- Unexpected Native American concerns

- Unforeseen Section 4(f) resources affected

- Project may encroach into the Coastal Zone

- Project may encroach onto a Scenic Highway

- Project may encroach on a Wild and Scenic River

- Unanticipated noise impacts

- Project causes an unanticipated barrier to wildlife

- Project may encroach into a floodplain or a regulatory floodway

- Project does not conform to the state implementation plan for air quality at the program and plan level

- Unanticipated cumulative impact issues

Caltrans' risk management process includes six steps:

- **Risk management planning** is the development of a Risk Management Plan for potential risk identification and development of a strategy to manage the risks. Caltrans uses a standard template that includes methodology, roles and responsibilities, budgeting, timing, risk categories, definitions of risk probability and impact, probability and impact matrix, reporting formats, and tracking to be used with the handbook. The template is for developing a risk management plan and ranging from incomplete environmental analysis, threat of a lawsuit, discovery of unanticipated impacts and others.

- **Risk identification** is the documentation of risks that might affect a project. The process, which uses input from internal and external stakeholders, is iterative; it evolves as the project progresses. Caltrans provides tools to help identify risks, such as a sample risk breakdown structure by project components—environmental, design, ROW, construction, external, organization and project management—and a sample list of potential environmental risks by component.

- **Qualitative risk analysis** prioritizes risks for further action. After the risks are identified, the team assesses the probability and impact of the risks and categorizes them into high, moderate, and low risk based on the potential effect on schedule, cost, scope, or quality. The risks are then ranked by degrees of probability and impact

- **Quantitative risk analysis** uses statistical techniques to estimate the probability that a project will meet its cost and time objectives. The analysis shows how likely the plan is to come in on schedule or on budget, how much contingency of time or money is needed, and which activities or line-item cost elements contribute the most to the possibility of overrunning the schedule or cost estimates.

- **Risk 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** keeps track of identified risks, residual risks, and new risks over the life of the project. It also monitors the execution of planned strategies and evaluates their effectiveness.

Caltrans is committed to using a project management system and including risk management in that process, to ensure that individual projects are delivered on time and within budget. In Caltrans' system, the director delegates responsibility for project delivery to the district directors, and the deputy director of finance has responsibility for approving changes in project scope, cost, and schedule. Only the state Transportation Commission can change the programmed cost and programmed fiscal year for projects in most programming documents.

Florida's Risk-based Graded Approach

FDOT's risk analysis method is similar to the Caltrans method, but FDOT also developed a risk-based graded approach—a quick process to identify the overall risk value of a project, and the Project Risk Register—a formal risk analysis using input from internal and external stakeholders for complex and risk-prone FDOT projects.[50] Similar to the WSDOT assessment, the first step in the FDOT method is development of a Risk Management Plan to identify and document potential project risks. Types of risk shown in Exhibit 2. Risk Types Covered in a FDOT Risk-Based Graded Approach Analysis.

Exhibit 2. Risk Types Covered in a FDOT Risk-Based Graded Approach Analysis

TECHNICAL RISKS

- Preceding phase project deliverables are incomplete
- Preceding phase reports/ plans are in error
- Right of way studies are not accurate
- Environmental analysis is incomplete or in error
- Unexpected geological issues
- Inaccurate design assumptions in PD&E Report
- Surveys are late or are in error
- Geotechnical reports in error
- Hazardous waste analysis incomplete or in error
- Need for design variations or exceptions
- Context sensitive solutions create design delays

EXTERNAL RISKS

- Right of way delays as a result of court actions
- Changed priorities
- Local communities or groups pose objections
- Funding changes
- Political factors change
- Stakeholders request late changes
- New stakeholders emerge with new demands
- Influential interests raise objections
- Lawsuits to halt or change the project
- Pressure to choose time over costs or quality
- Delays in agreements with local agencies, railroads, etc.
- Utility relocation delays
- Permitting issues

ENVIRONMENTAL RISKS

- Delays in permit approval
- Changed requirements for permits
- Changes in environmental regulations
- Reviewing agencies require higher-level review than expected
- Lack of specialized staff to perform environmental analysis
- Unidentified special-interest sites discovered (historical, endangered species, etc.)
- Environmental class of action changes
- Public controversy arises over environmental issues
- Change in alignment requires new environmental analysis
- Section 4(f) lands become involved
- Pressure to compress the schedule for environmental analysis

ORGANIZATIONAL RISKS

- Inexperienced staff assigned
- Lack of staff assigned to the project
- Loss of critical staff at critical point in project
- Insufficient time to plan project
- Unanticipated Project Manager workload
- Delays getting approvals and decisions
- Support units unavailable or overloaded
- Changed priorities
- Project under funded
- Inconsistent project goals (objectives, schedule, budget and quality)

PROJECT MANAGEMENT RISKS

- Project need and purpose poorly defined
- Project scope is poorly defined or incomplete
- Selection of a poor consultant or subconsultants
- Selection of a poor contractor
- Project Manager does not have control over staff priorities
- Too many projects
- Estimating and/or scheduling errors
- Poor communication within the team
- Unrealistic schedule
- Changed schedule
- Lack of coordination among support units
- Lack of management support
- Changes in key staff members

PROJECT MANAGEMENT RISKS

Many of the above issues will apply to the consultant as well, however consultant Project Managers must also address risk as it applies to profitability. Some unique risks for a consultant Project Manager may include:

- Incomplete or inaccurate scope of services
- Scope creep
- Unrealistic budget
- Unrealistic schedule
- Inappropriate, unnecessary or conflicting comments on FDOT reviews
- Late comments on submittals
- Unexpected rise in firm overhead
- Unresponsive subconsultant(s)
- Assessment of errors and omissions claims
- Change in FDOT Project Manager

■

The risk types are used as a starting point, but the assessment is adapted to reflect individual project conditions. The risk-based graded approach analysis quantifies project risks early in project development and helps 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:

- Determine where to assign limited PM resources

- Define the project scope

- Evaluate risk elements (risk versus cost)

- Get agreement from all members of the project team

FDOT identified 15 critical risk elements (other risks can be added or some eliminated) to assess the overall level of risk, per element, per project priority (i.e., scope, schedule, cost, and quality). The project team assigns each element a value between 1 and 5. The risks are then prioritized, based on 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. Exhibit 3. Florida DOT Risk-Based Graded Approach Worksheet, illustrates a sample worksheet.

Exhibit 3. Florida DOT Risk-Based Graded Approach Worksheet

ITEM	RISK ELEMENT	RISK ASSESSMENT	PRIORITY	TOTAL
1	Utility Involvement	1	3	3
2	Project Schedule	5	5	25
3	Interfaces	3	1	3
4	Experience/Capability	3	3	9
5	Right-of-Way Involvement	5	5	25
6	Environmental Impacts/Contamination	1	1	1
7	Regulatory Involvement	3	3	9
8	Contractor Issues	5	3	15
9	Resource and Material Availability	3	3	9
10	Project Funding	1	1	1
11	Political Visibility	3	5	15
12	Public Involvement	3	3	9
13	Safety	3	3	9
14	Construction Complexity	1	1	1
15	Weather Sensitivity	3	1	3
			Risk Score	**137**

Low Risk	0 - 90
Medium Risk	90 - 150
High Risk	>150

Source: FDOT Project Management Handbook

After the project management team prioritizes potential risks using the qualitative risk analysis described above, the effect of those risks can be quantified. The qualitative risk analysis prioritizes the risks and assigns a cost in dollars if the risk occurs. Techniques for quantifying

risks include interviewing stakeholders to determine probabilities and impacts, sensitivity analysis, decision tree analysis, and simulation (i.e., Monte Carlo technique).

Finally, a risk response plan assigns one of the following strategies for each risk, considering the risk priority:

- Change the project plan to eliminate or avoid the risk.

- Change the scope of a proposed or existing contract to transfer the risk to a consultant, contractor, or insurance company.

- Mitigate the risk to reduce the probability and impact of a risk to an acceptable level.

- Accept the risk.

- Select a strategy that has the best cost-benefit.

Exhibit 4. Florida DOT Risk-Based Graded Approach Worksheet illustrates a FDOT risk response plan.

Exhibit 4. Florida DOT Risk-Based Graded Approach Worksheet

Risk	Response
High Priority Risks	
Local communities will pose objections	**Include a well prepared community action plan in the consultant scope and ensure consultant devotes adequate staff in negotiations.**
Delay in railroad agreement	**Begin negotiations with railroad early in the project and ensure adequate consultant support is available.**
Unanticipated project manager workload	**Request that an assistant PM be assigned to the project. Work closely with Professional Services to ensure the consultant selection process results in a consultant that can be expected to produce with minimum oversight by the FDOT project manager.**
Intermediate Priority Risks	
Selection of an inexperienced consultant	**Follow recommendation in response for unanticipated project manager workload.**
Aggressive schedule	**Review schedule before finalizing consultant scope and revise if necessary.**

Source: FDOT Project Management Handbook

New Jersey DOT: In-depth Scope Exploration

In New Jersey on the Route 31 project, the project team conducted one-on-one interviews with stakeholders such as property owners, developers, interest groups, and local governments (both elected officials and technical staff). These interviews provided valuable insights into site-specific development issues and the interests of local jurisdictions on the proposed bypass project. The NJ Route 31 project team also created an advisory group that included representatives from New Jersey DOT (NJDOT), FHWA, local governments, and local business associations. To facilitate both the stakeholder interviews and advisory group meetings, the

project team held multiple-day design workshops. These workshops, which included stakeholder interviews, site visits, and working sessions, created a studio environment that helped the project team test design ideas and continue to learn about local priorities and issues, minimizing the DOT's risk later in the process of being off base with community preferences. Such extensive efforts can sometimes increase costs, but such approaches also increase predictability with regard to final project budgets and can, as in this case, eliminate the need for more expensive solutions such as the bypass originally envisioned.

Maryland SHA: Commitment Tracking through Design and Construction Help Avoid Costly Surprises

On its massive Woodrow Wilson Bridge and InterCounty Connector projects, Maryland State Highway Administration (MDSHA)'s construction commitment tracking systems functioned as registers for risk monitoring and control through the design and construction phase of the project. On the Woodrow Wilson Bridge project, an onsite coordinator tracked 1,400 project commitments that affected all resources, until a risk was retired or no longer a threat. Such commitment tracking or risk reporting was a standing agenda item at project team meetings When environmental violations were alleged in one case, the allegations were dropped when MDSHA's responsiveness to the issues in question were amply demonstrated through the agency's commitment tracking and risk management system. More manageable, low probability risks can be dealt with by active acceptance through a contingency reserve to handle the risk, or by working through low impact or low probability issues as they arise.

Proactive Mitigation Planning in Multiple States

Multiple states are now engaging in proactive mitigation planning, with encouragement from SAFETEA-LU and the interagency Eco-Logical approach (*Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects*). Examples of this approach in the Colorado Short-grass Prairie Initiative, the North Carolina Ecosystem Enhancement Program, and Oregon Bridges have already been discussed. Caltrans has invested in a statewide evaluation that is occurring now.

On a project basis, with the Woodrow Wilson Bridge, MDSHA, and project partner VDOT were also proactive in planning offsite mitigation of environmental impacts, effectively avoiding threats and risks of prolonged delay from lack of interagency agreement, environmental non-compliance, and possible project work stoppages or lawsuits.

Advance mitigation that is sufficiently attractive to achieve buy-in from multiple regulatory agencies and other stakeholders may have more potential to streamline project development, increase predictability, and smooth project management, than just about any other factor. Thus, advance mitigation should be considered a critical tool in any risk management toolbox.

7.2 Schedule Management

The environmental review process requires project sponsors to navigate a complex regime of procedural and substantive laws. It currently takes almost seven years on average to reach decisions on projects that have significant environmental impacts because of the complex interrelationships among the various Federal and state environmental requirements, the linear nature of the current process and the time required to finance, design and construct the project. If the cost of a $100 million project increases at 10 percent a year over that net period of time, the project will cost almost $195 million by the time a ROD is reached.[51]

DOTs are facing ever increasing time and schedule pressures. FHWA's Environmental Vital Few Goals called for a decrease in the median time needed to complete an EA from approximately 18 months to 12 months by September 30, 2007. It also called for a decrease in the median time needed to complete an EIS from approximately 54 months to 36 month by September 30, 2007. Historically, major projects have taken 10 years or more to advance from the planning phase to completion of construction and 20 years was not uncommon for some complex, controversial projects. The concept of "environmental streamlining" arose in 1998 during the congressional reauthorization of the Intermodal Surface Transportation Efficiency Act. Such streamlining involves re-engineering the environmental review and approval process portions of the project development process to shorten their time frames while ensuring environmental protection. Sometimes it also involves enhancing the DOT's contributions to positive environmental outcomes.

In 1998, Congress enacted the Transportation Equity Act for the 21st Century (TEA-21), which included provisions aimed at coordinating federal agency involvement in major highway projects under the NEPA process.[52] The provisions were intended to address concerns about delays in implementing projects, unnecessary duplication of effort, and added costs often associated with the conventional process for reviewing and approving surface transportation projects. SAFETEA-LU (Question/Answer 50) re-emphasized the need for schedule management to complete projects on time, within budget, with the highest degree of quality and public support. Major capital projects with an estimated total cost of $500 million or more are required to develop a Project Management Plan (PMP) to serve as a "roadmap" to clearly define roles, responsibilities, processes, and activities to deliver projects in an efficient and effective manner. The PMP is integrated into the coordination plan discussed earlier.

Importance of Schedule Management

Project schedule management is a critical part of NEPA Project Management. Schedule delays affect not only the agency's credibility with the public, but they also result in increased costs. It is essential to take the time up front to solicit input from the stakeholders, resource agencies, and the project team to identify potential environmental and cultural issues, and get a comprehensive understanding of the scope of the project. This will allow the project manager to develop a realistic schedule that allows a reasonable time frame for public involvement, data collection, impact analysis, mitigation planning and permitting that will ultimately result in a more streamlined NEPA process, a more realistic schedule, and increased success in delivering a project on time.

It is very important for NEPA Project Managers to understand the interplay between Design, ROW, and Environment. Interdependencies among these project components typically mean that a missed milestone will have a "domino effect" on the schedule. Most often, schedule changes can be traced back to a change in scope. This often results in a redo of work for any or all of the functional units. It may also require additional resource agency consultation, ROW evaluation, utilities coordination, etc., and result in inherent delays. Thus, scope management is essential to schedule management.

Also critical is creating realistic schedules for each part of the process and quantifying times for each task in order to better manage the whole. Project managers should include resource specialists to determine time-frames for completing specific tasks such as field surveys, agency coordination, preparation of a Biological Assessment and Biological Opinion and others.

> Often, overly aggressive and unrealistic schedules can result in errors and delays later in the process.

State DOTs are devoting increased attention to actively

managing project schedules. FDOT's *Project Management Handbook* devotes an entire chapter to schedule management.[53] The Handbook provides guidance on how to develop a schedule, monitor the schedule, and make corrections as needed. It also emphasizes the importance of developing and executing a project schedule with sufficient detail to identify clearly the critical path items to anticipate problems. If issues arise, the Handbook suggests developing a strategy for corrective action to mitigate and eliminate potential problems before they affect the schedule. The handbook notes that schedule management, "helps to manage the dollar commitment for each stage of the project." A detailed schedule also helps the project manager allocate adequate funds for each phase of the project.

7.4 Systems to Manage Project Work, Environmental Permits and Activities

Most DOT environmental work is managed out of the environmental office. Fewer are structured around projects and thus of use to DOT Project Managers. Increasingly, there are linkages between environmental specific and larger project management systems though. Most commonly, the linkage is to download data from the project management system into the environmental work scheduling/tracking system. High-level milestones may be incorporated into the agency wide project management system.

TxDOT's Environmental Tracking System

Texas DOT (TxDOT) has developed a comprehensive Environmental Tracking System (ETS) to follow projects throughout the planning stages and ensure that NEPA issues are addressed and environmental permits are coordinated before the project is released for construction. TxDOT design personnel can determine if all Environmental Permits, Issues and Commitments (EPIC) are addressed in the project plans by accessing ETS. The system allows for a paperless environment and for project documents to be saved electronically with any combination of Word, Excel, bitmap, and tif files, which can then be circulated electronically for review. Email notifications alert senders and TxDOT reviewers when a document has been sent and when the review is completed.

The ETS estimates total process time for environmental clearance, ROW, and Plans, Specifications and Engineering (PS&E). The project type, ROW acquisition and number of parcels are all factored into the calculation. Given the "received in Environmental date," the model calculates the receipt of PS&E date, letter of authority date, and the month letting will occur. Given the month letting is anticipated, the model calculates the date the document must be received in Environmental to meet that letting.

New York State DOT's ETRACK

New York State DOT (NYSDOT) developed a statewide web-based system for tracking permits, permit conditions, status, and NEPA document commitments. Called ETRACK, the system offers the ability to track items of interest, see how many permits are in process and how long they took, and perform queries. The agency is not doing any environmental cost estimating at this time, but such capabilities may be added to state systems in the future. ETRACK will have a standard reports for comprehensive environmental status (permitting process), cultural screening form and an environmental checklist. NYSDOT's Environmental Commitments and Obligations Package (ECOPAC) is an Adobe Portable Document Format (PDF) checklist that the Design group Completes and gives to Construction. Construction keeps the form and uses it for follow up, awareness, and inspection in the field.

Virginia DOT's iPM and CEDAR

VDOT's project management procedures include development of a project schedule. The project manager is responsible for the development and maintenance of the project schedule

with collaboration and support from the project team.[54] Project tasks are identified using the project tasks and scheduling guidelines and a project schedule template. The schedule is built in the Integrated Project Manager (iPM) system or MS Project using input from team members. The project manager and project team review and update the schedule at a minimum of every 90 days, at each project milestone, or more frequently as needed. The review includes documentation of variances and related adjustments. IPM is linked to VDOT's CEDAR system, discussed previously.

NMDOT's Program Project Management System

New Mexico DOT (NMDOT)'s Office of Infrastructure Program Management Division has a Project Production and Scheduling Bureau, which manages the transportation improvement program including maintaining and supporting the DOT's multi-project scheduling system (Program Project Management System – PPMS). The scheduling component of PPMS is driven by Primavera scheduling software. The products of PPMS are varying types of scheduling and production reports that allow the DOT to assess the status of the program and make key decisions regarding program delivery. The Bureau continuously updates project information, identifies issues that might hinder project delivery, and coordinates resolution of these issues. Staff analyze program/project data and produce reports for the Governor's Office, Legislature, and New Mexico Finance Authority, as well as NMDOT management/personnel, and others and provides Information Systems and services to support PPMS in the areas of project scope, schedule, cost estimation, and training.

Negotiated Timeframes

Negotiated timeframes can provide goals and structure for the environmental review process. Timeframes are developed in consultation with lead, consulting, and cooperating agencies at or near the beginning of a project, and are reexamined on a continuing basis and readjusted if necessary. Establishing timeframes can lead to efficiencies that:

- Improve timeliness of the process;
- Identify issues early;
- Encourage early participation of environmental resource and permitting agencies; and
- Recognize resource limitations upfront.

FHWA's Negotiated Timeframe Wizard

While most state DOTs develop schedules and use project management software, there is considerable variability in scheduling practices involving FHWA Division Offices and/or resource and permitting agencies. FHWA's Negotiated *Timeframe Wizard* online tool that allows agencies to set project-specific timeframes for completing requirements, track the progress of meeting timeframes, and maintain a history of events. The tool helps transportation and resource agencies coordinate their efforts by facilitating establishment of timeframes for EAs, EISs, and for other Federal requirements (especially environmental ones) that may be affected by a transportation project. Additionally, the Wizard contains a mechanism for documenting any changes made to the negotiated project schedule. The changes then become a part of the project history tracked by the Wizard.

The basic steps for working with the Wizard are:

- An agency enters project contacts, project type, cooperating and consulting agencies, and identifies which Federal requirements will likely be applicable to the project. Based on this information, the Wizard creates the selected EA or EIS project (a Wizard project).

- The Wizard automatically generates a default negotiated timeframe for the EA or EIS based on the project start date entered by the agency. Default periods are 12 months for an EA and 36 months for an EIS (FHWA's Vital Few Goals for 2007).

- As the project moves forward, the lead agency may renegotiate timeframes for the EA or EIS, and for Federal requirements. The agency also documents reasons for schedule changes in the Wizard. Agencies can share Wizard project files (similar to other word processing or spreadsheet files) with others, helping to improve project coordination and shorten the review period.

- The Wizard generates a variety of project reports to support project management. These reports include the Renegotiation History (displays renegotiation dates for a requirement), the Negotiated Timeframe (displays the negotiated timeframe for a requirement, listing all agencies involved in the review of the requirement), and the Gantt chart (displays timeline[s] for a single or multiple requirements).

To use the Wizard, DOTs should:

- Download the Wizard: Visit the *Vital Few Environmental Goals* section of the Environmental Streamlining website.

- System Requirements: Windows ME/2000/XP.

- Registration: Agencies can register online to receive software updates and Wizard news.

DOT Environmental Commitment Tracking Systems

Commitment tracking systems are a key QA/QC mechanism for state DOTs and can be very helpful for Project Managers. DOT use of such systems improves compliance reliability and demonstrates performance. As MDSHA noted, reporting and tracking systems also build comfort levels within and across agencies. This increased trust has led to tangible process streamlining benefits, reducing and combining the number of commitments or requirements overall.

The number and necessity of each permit condition remains a challenge. This is partially due to the complexity of how and what to include in contract documents considering the many types and levels of permits—many project level and many applying to various sets and geographical areas—and with some already incorporated in state DOT processes and in redundant systems (designs, plans, contracts, specs) and others that are not. As mentioned, not all permits and agreements are project-specific. These days, DOTs and partner agencies have tried to achieve higher efficiencies through the design and implementation of many types of programmatic agreements, covering multiple projects of a certain type, with certain features, or in a certain geographic area. Occasionally, the scope of a programmatic is so narrow it is almost project specific, but others are region-wide, statewide, or even nationwide. State DOTs have varying opinions and approaches with regard to the need for including and potentially repeating some of these commitments in a dedicated environmental commitment tracking system.

State DOTs have dealt with the sheer number of commitments in a variety of ways:

- Taking a more complete, encompassing view of commitments, to ensure that all are tracked, WSDOT's permit conditions commonly run up to 80 pages per project. WSDOT is using their Comment Tracking System (CTS) to make sure that every commitment is recorded, and now the agency is using the system to inform and bolster discussions with resource agencies on exactly what the DOT is being asked to do.

- At KYTC, Project Managers limit the number of commitments they enter into the system to those which have no other way to be documented. Many commitments are documented in designs and construction contracts. Those are unlikely to be entered into the system, which instead focuses on the commitments most likely to fall through the cracks; e.g. small commitments to landowners.

- MDSHA has focused on meetings with the resource agencies to carefully review and combine requests for commitments, to ensure that commitments are covered in an economical fashion.

- In Vermont, the large number of commitments has prevented the agency from going forward with tracking them. Ongoing investment in the system has been very limited.

- VDOT's CEDAR has generated a unique degree of success among statewide environmental commitment tracking systems in the degree to which it has begun to standardize commitment names (categorizing titles of different types of commitment descriptions). CEDAR has pull down menus with the program area and then a long list of commitment names. This helps with reporting and with internal monitoring and process improvement.

- TxDOT is working toward having each project in an environmental management system (EMS) framework. TxDOT has decided they want to narrow factors to include project type, geographical setting, and urban/rural location. Regulatory requirements feed into specifications related to aspects and actions.

To date, no state fully tracks all commitments from inception to maintenance, documents commitments met, and reports on agency performance and opportunity areas for improvement, but VDOT and WSDOT's increasingly comprehensive systems are closing in on this objective, removing a liability for the NEPA project manager.

The scope and reliability of commitment tracking is a special concern since the most functional and comprehensive commitment tracking system will have commitments entered into a standard process that ensures committments are tracked and considered at all appropriate points in the life cycle of the project. The tracking system should ensure that checks and balances are in place to prompt or guarantee that right steps are taken at the appropriate times.

Improving Communication Internally and Externally

The process of designing, developing, implementing, and using the tracking systems has improved communications among DOT sections and functional areas. Greater interaction across the state DOT offices during each step in the life cycle of a project results in benefits that go beyond the systems themselves as the needs and issues of the broader organization are addressed and incorporated.

While commitment-tracking systems have fostered improvements in communication in the project development process, to Design and subsequent stages, such systems may need to be extended to planning as well. TxDOT's Environmental Tracking System is tailored for the project development process as traditionally executed, with most interagency consultation starting at NEPA and environmental permitting after NEPA, and does not include early project coordination. DOT Environmental sections have a need for environmental information and decision support systems in planning as well as project development, and beyond, for implementation of commitments in construction and maintenance.

KYTC's Communicating All Promises (CAP) system places explicit emphasis on informal communication between environmental staff and the project manager. Environmental staff must discuss environmental commitments with the Project Manager, who must understand and accept them, before personally entering those commitments into the CAP screens of the

agency's project management system. KYTC says the system has effectively encouraged more communications among Environmental, Design, and Construction staff.

To date, Maryland is the only state to have made their system accessible to resource agencies. MDSHA's Environmental Monitor (EM) Toolkit was built in part to communicate directly with resource agencies. This arrangement has greatly increased the COE and the Maryland Department of the Environment's comfort level with MDSHA's responsiveness about and seriousness in tracking environmental non-compliance.

Integration with Other State DOT Systems is Key

A key factor in the development of DOT environmental commitment tracking systems has been the goal of reducing the number of independent and uncoordinated tracking systems. Furthermore, integration with existing databases and project management systems eases the data entry burden and facilitates use.

Virginia was one of the few states that counted the tracking systems it replaced as the system was developed. Thus far, VDOT's CEDAR system has replaced more than 73 tracking systems previously in use throughout the state, greatly reducing issues and risk related to data redundancy and duplicative work.

Commitment tracking systems are frequently integrated with project management systems so that basic project information may be downloaded, ensuring consistency and saving time on re-entry. KYTC's commitment tracking system has less functionality related to commitments or environmental requirements and follow-up than some, but it is fully integrated with their preconstruction project management system for all projects in the 6-Year Plan. The agency merely added screens related to environmental commitment tracking to the existing system. Thus, none of the project managers had to learn a new system and it has become an integral part of their work.

MDSHA's Toolkits are all based on a framework that allows data to be easily shared between the different applications. There are on-going discussions about providing a connection between the Toolkits and MDSHA Environmental Protection Division's (EPD) Workload Database. Workflow could also be controlled between sections and functional areas; e.g., the QA Toolkit would provide a link from the section performing erosion and sedimentation control inspections to the Environmental Programs Division (EPD)-managed projects. MDSHA is adding an activities calendar to track project activities relating to permit compliance including document submittal reviews, meetings and other associated activities. This will function as a workflow management tool, providing a calendar, milestones, and reminders on a daily, weekly, and/or monthly basis.

VDOT's system is currently the most comprehensive and integrated and was not inexpensive to develop. It encompasses scoping, commitment tracking, compliance reviews and corrective action tracking, workflow management, and alerts, as well as a degree of environmental asset management. Given the transition from many individually managed databases to CEDAR, CEDAR's success is important both organizationally and financially. Time and effort are more efficiently utilized now that a single, centralized system acts as a repository for all environmental commitment data. Furthermore, by prompting Environmental staff to add commitments when appropriate, CEDAR has produced more streamlined and consistent reports. The majority of VDOT's environmental deliverables are now generated through the application, which is the agency's authoritative source for documentation.

DOTs are increasingly investing in workflow management, document management, and reporting and accountability systems, with a premium on integration.

- Workload and workflow management is viewed as a highly linked, equally important task with environmental commitment tracking.

- Lead states are using an Oracle/Standard Query Language (SQL) Server platform. Oracle provides a way to link multiple databases and systems in many states, often including an underlying document management system shared across systems.

- Most of the tracking systems are web-based or moving towards it. This is particularly true if the system is not static and has continued to evolve.

- While almost all states host their systems internally, MDSHA has branched out and is experimenting with external hosting.

- Lead states are seeking to link their systems to GIS, which is also seen as a way to link multiple information systems. Over half of the lead states have built in the capacity (location identifiers) to ease that transition.

- Integration with other information systems, and especially the DOT's project management system, is a major trend. All systems are integrated or have plans to integrate.

- DOTs are increasingly sharing their information and accountability systems with other agencies. Maryland and Virginia have gone the farthest with Texas and Washington close behind.

While environmental regulations change very slowly, the fields of technology, environmental analysis, interagency collaboration, and consultation expectations are changing rapidly. As DOT information systems have an important role to play in these areas, there will be increasing pressure to keep up and adapt to these changes, even as DOTs catch up with each other in implementing commitment tracking systems for all commitments on all projects.

7.3   Human Resources Management

The "people" end of NEPA project management involves identifying project roles and responsibilities, improving the competencies and interaction of team members, tracking team member performance, and coordinating changes to encourage better performance.

Efficient human resource management on NEPA projects will help DOT project managers:

- Better manage their teams in the efficient execution of NEPA tasks.

- Determine which tasks would best be assigned to contractors, and which would be best handled internally in order to effectively manage the project.

- Review the NEPA document to ensure a quality product.

- Manage internally conducted NEPA analyses.

- Manage internally written documents.

- Move the program expeditiously by integrating the tasks of one document into those of others.

Seasoned NEPA project managers often prepare a Project Initiation Letter to their appointed team, establishing clear project objectives and delivering management direction. A comprehensive list of NEPA project tasks for a specific project (often called a Work Breakdown Structure (WBS) can be used to establish project tasks, responsibilities, and timelines and prioritize multiple activities. Resource schedules help to identify potential problems. SMART (specific, measurable, agreed to, realistic, and time-constrained) performance standards (quality criteria) may be identified for all potential NEPA tasks. A mockup or prototype of the projected

NEPA document may be created. Finally, NEPA project managers must give attention to effective meeting management and be willing to do much "follow-up" or have effective reporting structures in place to manage their teams.

Interdisciplinary Teams

As those who teach NEPA often note, NEPA calls for interdisciplinary research. It's important to distinguish between *inter*disciplinary and *multi*disciplinary research. Multidisciplinary research simply means a bunch of specialists working on the same project; interdisciplinary research means interaction among the specialists—and presumably a fruitful symbiosis. For example, the specialists needed for the socio-cultural side of a NEPA analysis will probably be social scientists— anthropologists, sociologists, cultural geographers, archeologists—practitioners of such fields in the humanities as history and architectural history, and people in hybrid disciplines like landscape history. It is important to have them work with the other scientists involved in the assessment effort. For example, the people doing the water quality studies will have much to say to the people studying the affected community's use of fish, shellfish, aquatic plants, or water itself. The whole integrated picture is necessary in order to "do NEPA" well.

Resource Agency Staffing

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, over two-thirds of state DOTs have now established partnerships with resource agencies and non-governmental organizations, funding positions at these entities to perform environmental analysis and expedite projects.

SAFETEA-LU allows agencies to fund transportation planning activities that precede the initiation of the environmental review process, dedicated staffing, training of agency personnel, information gathering and mapping, and development of programmatic agreements. SAFETEA-LU specifies that funds may be directed to the US DOT and tribes for this purpose. Most states with DOT-funded positions have found these arrangements are helping to achieve the process efficiency and timeliness goals set forth by law as a condition of such funding.

In the 2005 study, every DOT with funded positions said the primary purpose of the positions was to improve project delivery and predictability and speed up permit/consultation turnaround times. 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 regulatory requirements of the other agency.

- Establish a better, more workable and efficient process.

- Provide good "down-line" results related to transportation decisions and environmental impact reduction, resource conservation, and preservation.

DOTs reported positive outcomes from their funded positions, stating that they were better able to:

- Complete better quality reviews more quickly and achieve scheduled project deadlines.

- Eliminate any 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 having the agencies involved early to identify and work through such problems.

- Improve permit/consultation turnaround times through a more efficient coordination process.

- Keep things on track and get back on schedule quickly when the unexpected occurs.

More than 80 percent of state DOTs have some sort of DOT-funded external support underway for environmental purposes. Sixty-eight percent of the 50 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. Efforts with non-governmental organizations are growing.

DOT-funded positions conduct a variety of tasks to help comply with permitting, review, and consultation requirements under laws including the ESA Section 7, CWA Sections 404 and 401, NHPA Section 106, and US Coast Guard (USCG) bridge clearances, as well as state regulations. A few of the positions 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 use of DOT-funded positions at resource agencies to review projects and provide environmental input in the planning phase.

7.4   Training: Know NEPA and Inter-relating Processes

FHWA and AASHTO leaders have been working together to develop the *Environmental Competency Building* (ECB) program available through FHWA. The ECB website provides a central source of information for transportation and environmental professionals to develop and maintain competencies (technical knowledge and skills) required for their work and managing the NEPA process. The goals of the program are to:

- **Enhance Practitioner Expertise** — Provide support and assistance to improve the skills and abilities of practitioners necessary in the environmental review and project development process.

- **Provide Access to Training and Resources** — Provide access to information on related training, seminars, workshops, and web-based resources that address key competency areas.

- **Broad Dissemination of Successful Practices** — Actively distribute and share innovation and useful practices within FHWA, the States, and throughout the transportation community to allow rapid adoption of the most effective and successful practices.

- **Recognize Existing Competency** — Identify current environmental expertise, needs, and industry expectations to encourage individuals, agencies, and organizations to build and support competent staff.

- **Explore Certification Programs** — Support relevant professional recognition programs within the industry to ensure a solid foundation of expertise.

FHWA and State DOT leaders developed an on-line Competency Navigator to assist professionals in identifying the key environmental and technical topic areas associated with the delivery of environmentally sustainable transportation programs. The Competency Navigator also offers links to a variety of resources available to enhance understanding in each of nine professional roles corresponding to an individual's job responsibilities. The individual can review the Level of Understanding for each environmental or transportation competency

recommended for someone in their position and explore multiple resources, including trainings, workshops, research reports, and guidance material, available to enhance their level of understanding in each topic area.

NHI's NEPA and Transportation Decision-making is a three-day course that considers FHWA's policies and procedures for applying NEPA to the project development and decision-making processes related to transportation facilities. The course emphasizes using the CEQ and FHWA's regulations and guidance for implementing NEPA and Section 4(f) of the Department of Transportation Act, as well as initiatives for interagency coordination and streamlining the project development process. Also emphasized are public involvement, Title VI/Environmental Justice, FHWA's policy for mitigation and enhancement, and the role of transportation in achieving sustainable development.

CEQ provides a list of nationally available NEPA training courses. CEQ does not review or endorse individual courses and descriptions are provided by the contractors. For additional information, the project manager is encouraged to communicate directly with the points of contact provided with the course descriptions.

- [Duke Environmental Leadership Program NEPA Courses and Certificate Program](#)
- [Environmental Impact Training](#)
- [Environmental Planning Strategies, Inc.: Consultative Workshops](#)
- [Environmental Training & Consulting International, Inc: NEPA Toolbox and Related Courses](#)
- [SWCA Environmental Consultants](#)
- [The Shipley Group](#)
- [USDA Graduate School: NEPA: Policy, Procedure, and Science/Art](#)
- [The Utah State University's NEPA Certificate Program Courses](#)

Conclusion

Both FHWA and state DOT NEPA project managers are challenged to prepare legally sufficient, high quality environmental documents within reasonable schedules and budgets. Managing the NEPA process requires both management skills and a strong background in the NEPA process and a myriad of environmental laws, regulations, and Executive Orders. Often, the NEPA project manager has many responsibilities beyond managing the NEPA process and finds it difficult to devote enough attention to a single aspect of project development. Thus, the project manager needs to foster good working relationships with internal and external professional experts to help him/her deliver a quality product.

The regulations and guidance allow many opportunities to inject efficiencies into the process but the process has evolved into a lengthy, unwieldy, and complex process that is looked upon grudgingly by project proponents. Many of the problems in implementing NEPA arise from the way the process is implemented. Many proven methods for reducing paperwork, cost and delays often go ignored in an agency's effort to develop "bullet proof" documents and avoid litigation. SAFETU-LU and the CEQ regulations, in particular, encourage agencies, and sometimes require agencies, to proactively take advantage of scoping, public and agency collaboration, quality analysis and document preparation to reduce the risk of litigation and efficiently and effectively manage the NEPA process to deliver transportation projects on time and in budget.

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