UNIVERSITY OF MINNESOTA

CENTER FOR TRANSPORTATION STUDIES

RESEARCH REPORT

Scoping in Environmental Review for Transportation Projects: A Study of NEPA Scoping Methods and Outcomes in State Departments of Transportation

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CTS 08-04

Technical Report Documentation Page

1. Report No.	2.	3. Recipients Accession No.
CTS 08-04		

4. Title and Subtitle	5. Report Date
Scoping in Environmental Review for Transportation Projects: A Study of NEPA Scoping Methods and Outcomes in State Departments of Transportation	December 2008
	6.

7. Author(s)	8. Performing Organization Report No.
Carissa Schively Slotterback, PhD, AICP and Susan Sloper	

9. Performing Organization Name and Address	10. Project/Task/Work Unit No.
Humphrey Institute of Public Affairs University of Minnesota 130 HHH Center, 301 19th Ave. S. Minneapolis, Minnesota 55455	CTS project number 2006072
	11. Contract (C) or Grant (G) No.

12. Sponsoring Organization Name and Address	13. Type of Report and Period Covered
Center for Transportation Studies University of Minnesota 511 Washington Avenue SE, Suite 200 Minneapolis, Minnesota 55455	Final Report
	14. Sponsoring Agency Code

15. Supplementary Notes

http://www.cts.umn.edu/pdf/CTS-08-04.pdf

16. Abstract (Limit: 200 words)

This report summarizes the findings of a study of scoping processes conducted in state departments of transportation (DOTs) in the U.S. The study focused specifically on scoping conducted as part of implementation of the National Environmental Policy Act (NEPA) for various types of transportation projects. The intent was to identify variation in approaches to scoping in DOTs across the U.S. and to identify the outcomes of scoping on later steps in the environmental review process, through the use of an online survey methodology. In addition, the study asked state DOTs to evaluate their own approaches to scoping. To supplement the national review of scoping practices, four case studies of recent scoping processes conducted by the Minnesota Department of Transportation (Mn/DOT) were completed. The key findings of the study provide insights into the range of approaches used for scoping in state departments of transportation, as well as valuable information about the influence of scoping efforts in environmental review.

17. Document Analysis/Descriptors	18.Availability Statement
National Environmental Policy Act (NEPA), Environmental impact statement (EIS), Environmental review, State departments of transportation (DOTs)	No restrictions. Document available from: National Technical Information Services, Springfield, Virginia 22161

19. Security Class (this report)	20. Security Class (this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	36	

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Final Report

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December 2008

Published by:

Center for Transportation Studies
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200 Transportation and Safety Building
511 Washington Ave. SE
Minneapolis, MN 55455

Acknowledgements

The authors wish to thank the University of Minnesota's Center for Transportation Studies for their funding of this research. In addition, thanks are offered to state department of transportation staff who responded to the survey. Special thanks also are offered to staff in the Minnesota Department of Transportation for their insights on Minnesota environmental review practices and recent cases.

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Executive Summary

This report summarizes the findings of a study of scoping processes conducted in state departments of transportation (DOTs) in the U.S. The study was conducted during 2006-2007 in the Humphrey Institute of Public Affairs at the University of Minnesota, with funding from the University's Center for Transportation Studies (CTS). The study focused specifically on scoping conducted as part of implementation of the National Environmental Policy Act (NEPA) for various types of transportation projects. The intent was to identify variation in approaches to scoping in DOTs across the U.S. and to identify the outcomes of scoping on later steps in the environmental review process, through the use of an online survey methodology. In addition, the study asked state DOTs to evaluate their own approaches to scoping. To supplement the national review of scoping practices, four case studies of recent scoping processes conducted by the Minnesota Department of Transportation (Mn/DOT) were completed.

The key findings of the study provide insights into the range of approaches used for scoping in state departments of transportation, as well as valuable information about the influence of scoping efforts in environmental review. Detailed findings are summarized in the remainder of the report, with highlights included here:

- Data collected during scoping processes vary by state, with the most frequently collected data including sensitive habitat; historic, archaeological, and cultural resources; and land cover or land use.

- State DOTs engage a wide range of stakeholders in scoping processes, including various groups as well as agencies at various levels of government.

- Techniques to engage stakeholders vary for agency and public stakeholders. For agency stakeholders, the most common participation techniques include meetings with staff from other agencies and sharing of data. For public stakeholders, the most frequently used participation techniques include open houses, advisory/steering committees, and project websites, though a wide range of other techniques are employed.

- DOT staff members perceive a relatively high level of effectiveness for agency and public stakeholder involvement. For the former, commitment to involvement by DOT staff and staff from other agencies appears most important in promoting effectiveness. For the latter, public stakeholder involvement, DOT staff commitment as well as interest among the public are the key contributors to effectiveness.

- The primary challenges faced by state DOTs in facilitating and managing scoping processes included public opposition to proposed projects, getting other agencies to participate, and getting the public to participate.

- DOT staff members indicate that stakeholder involvement in scoping processes has effects on the content and outcomes of environmental review processes. Agency stakeholders have substantial effects on the selection of alternatives for evaluation in the

environmental impact statement (EIS), identification of key impacts to focus on in the EIS, data to be considered, identification of additional stakeholders, and mitigation strategies. Public stakeholders also influence the selection of alternatives, though at lower rates than agencies. The most commonly affected content type or outcome for public stakeholders is the identification of additional stakeholders.

- In general, there is general agreement that scoping influences the content of EISs and leads to better identification of environmental impacts. However, there appear to be some concerns about the ability of scoping to reduce time and resource (e.g. staff, financial costs) needs for NEPA processes.

I. Study Overview

This report summarizes the findings of a study of scoping processes conducted in state departments of transportation (DOTs) in the U.S. (Slotterback 2008, forthcoming). The study was conducted during 2006-2007 in the Humphrey Institute of Public Affairs at the University of Minnesota, with funding from the University's Center for Transportation Studies (CTS). The study focused specifically on scoping conducted as part of implementation of the National Environmental Policy Act (NEPA) for various types of transportation projects. The intent was to identify variation in approaches to scoping in DOTs across the U.S. and to identify the outcomes of scoping on later steps in the environmental review process, through the use of an online survey methodology. In addition, the study asked state DOTs to evaluate their own approaches to scoping. To supplement the national review of scoping practices, four case studies of recent scoping processes conducted by the Minnesota Department of Transportation (Mn/DOT) were completed.

The key findings of the study provide insights into the range of approaches used for scoping in state departments of transportation, as well as valuable information about the influence of scoping efforts in environmental review.

II. Understanding Scoping and NEPA

The National Environmental Policy Act (NEPA) requires that scoping be conducted as an initial step in environmental review processes. Under U.S. law, scoping sets the stage for later steps in the NEPA process, providing an initial opportunity to gather information and engage the stakeholders around the preliminary identification of alternatives for consideration in the Environmental Assessment (EA) and Environmental Impact Statement (EIS) (Jain et al. 2002, Bass 2001). General guidelines related to scoping are provided by the Council on Environmental Quality (CEQ), the U.S. agency charged with overseeing NEPA implementation. Briefly, the scoping guidelines state that, "There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (40 C.F.R. 1501.7). Additional guidance is provided by the CEQ, as well as federal and state agencies charged with implementing NEPA. In general, scoping typically includes gathering preliminary information within the implementing agency, as well as from other agencies, stakeholder groups (i.e. advocacy or special interest organizations), and the general public. This information may include identifying impacts likely to be most significant, data needed to evaluate environmental impacts, recommendations on methodologies used to evaluate environmental impacts, and preliminary feedback on proposed alternatives to be evaluated during later steps in the NEPA process.

In addition to guidance provided in NEPA and by the CEQ, individual state and federal agencies charged with NEPA implementation often have their own guidelines. In the context of transportation, the Federal Highway Administration (FHWA) has guidelines which state:

> For actions that require an [Environmental Assessment] EA, the applicant, in consultation with the Administration, shall, at the earliest appropriate time, begin consultation with interested agencies and others to advise them of the scope of the project and to achieve the following objectives: determine which aspects of the proposed action have potential for social, economic, or environmental impact, identify alternatives and measures which might mitigate adverse environmental impacts; and identify other environmental review and consultation requirements which should be performed concurrently with the EA. The applicant shall accomplish this through an early coordination process…or through a scoping process. Public involvement shall be summarized and the results of agency coordination shall be included in the EA (23 C.F.R. 771.119).

The most recent iteration of the federal transportation bill in 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), also includes more specific provisions for inviting and designating "participating agencies" and requires the development of a plan to coordinate agency and public involvement (PL 109-59, 10 Aug 2005).

Some individual state DOTs also provide guidance related to NEPA and stakeholder involvement. For example, Mn/DOT provides relatively extensive guidance, integrating NEPA into its Highway Project Development Process (HPDP), which links NEPA, scoping, and stakeholder involvement to steps in the transportation project development process, including planning, design, and construction. Minnesota's *Hear Every Voice* document also provides guidance related to stakeholder involvement. For the most part, federal and state transportation

agency guidance focuses primarily on the goals and intent of stakeholder involvement, rather than providing details about techniques, outreach methods, timing, or other procedures.

The emphasis on scoping in this study, is provided in recognition of the important role that this step in the NEPA process can play in shaping environmental review outcomes. Previous studies have established a number of positive impacts of scoping including:

- Promoting time and financial savings (Baker and Rapaport 2005, Eccleston 2000, Sadler 1996, Snell and Cowell 2006, Wood et al. 2006);
- Identifying priority concerns and significant impacts (Beanlands 1988, Eccleston 2000, Kennedy and Ross 1992, Ross et al. 2006, Sadler 1996, Weston 2000, Wood et al. 2006);
- Providing opportunities for stakeholder organization and influence (Beanlands 1988, Jones 1999, Slootweg and Kolhoff 2003); and
- Contributing to environmental review content such as impacts, project alternatives, mitigation measures, and identifying additional participants (Kennedy and Ross 1992, Mulvihill 2003, Mulvihill and Jacobs 1998, Wood et al. 2006).

III. Study Methodology

In order to evaluate the various approaches to scoping used in state DOTs, a web-based survey of DOT staff was administered in the spring of 2007 (Slotterback 2008, forthcoming). Researchers identified staff involved in NEPA processes in DOTs in each of the 50 U.S. states, from one to nine persons per state. The intent was to achieve at least one response from each state. A total of 46 states responded to the survey, amounting to a state response rate of 92 percent. Where more than one response was gathered from an individual state, mean responses were calculated to represent a single set of responses for each state. State responses were retained as confidential. Thus, the findings are presented as summary data across the states, rather than highlighting the responses provided by individual states.

Based on demographic data collected in the survey, the vast majority of respondents were environmental review coordinators in their agency, with most respondents having training in three areas including engineering, biological sciences, and natural resources/environmental management. Respondents' indicated involvement in various activities in their agencies, including 74 percent in environmental analysis, 57 percent in project management, 55 percent in consultant management, and 48 percent in public involvement coordination or facilitation. Over 67 percent of respondents had experience in over 40 environmental review processes and over 85 percent had experience in over 20 processes.

As noted previously, in addition to the national survey, the researchers examined four local case studies in Minnesota shown in Figure 1. Case studies were selected at the recommendation of Mn/DOT staff and represent different geographic locations, types of transportation facilities, and varied environmental issues. For the case studies, the researchers reviewed environmental review and other relevant documents and conducted interviews with Mn/DOT staff and consultants involved in facilitating the scoping efforts conducted in each environmental review process. The case studies included the following:

- Highway 14, Owatonna to Dodge Center. This project represents transportation improvements to existing four lane bypasses in a 19-mile corridor in southern Minnesota.
- Highway 41 River Crossing, Carver County. This project is a proposed new crossing of the Minnesota River, connecting Trunk Highway (TH) 169 and TH 212 near the southwest edge of the Twin Cities Metropolitan Area.
- Highway 23/71, Willmar. This project represents transportation improvements in a 3.5-mile alignment in a growth center in central Minnesota.
- St. Croix River Crossing, Stillwater. This project is a proposed new bridge to replace an existing lift bridge in a historic community in a Wild and Scenic River Valley.

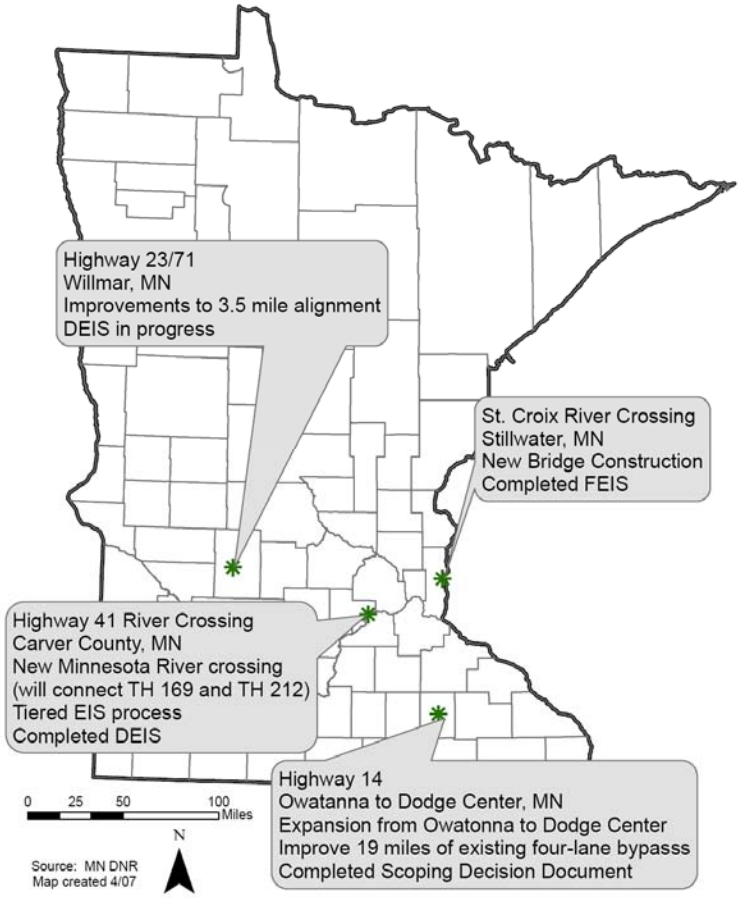

Figure 1. Mn/DOT Case Study Locations.

IV. Research Findings

This section summarizes the findings from the survey of state DOTs regarding their scoping approaches (Slotterback 2008, forthcoming). In addition, the findings from the Minnesota cases studies are interspersed to provide more specific details about application in particular scoping case settings. The research findings fall into a number of categories including data collection, stakeholder involvement, facilitation and management of scoping processes, and effects of scoping. The findings and potential implications relative to each topic are discussed. The focus in presenting the findings is on the survey results. At the same time, selected findings from the Minnesota case studies will be interspersed.

A. Data Collection in Scoping

The scoping step is often where preliminary data collection efforts begin. At the outset of the environmental review process, DOTs may be examine data needs to address likely issues to be addressed as environmental documents are prepared. Data may be gathered internally or consultation with other agencies and the public. In general, there is relative consistency among the states in terms of the types of data that they collect, as shown in Figure 2. Out of the 46 states that responded to the survey, the most commonly collected data included sensitive plant and animal habitat; historic, archaeological, and cultural resources; and land cover or land use. Less than 30 states collected data related to air quality, economic data, and hazards such as seismic hazards and coastal storms.

Explaining this pattern of data collection is difficult, though one explanation might be the presence of specific agencies outside of the DOT with jurisdiction over habitat, historic/archaeological/cultural resources, and land use. These agencies including departments of natural resources, state historic preservation offices (SHPOs), and local governments may have well developed data sets that can easily be interjected into environmental review efforts. Further, early efforts to involve such agencies in environmental review processes, might facilitate the early collection of relevant data.

For the less frequently collected data types such as demographic and economic data and hazards, there may not be a single agency that holds this data. Air quality represents an anomaly near the bottom of the list of data types collected as there are often state or regional air quality management agencies that might be involved. However, these agencies might have a greater focus on stationary sources (e.g. energy facilities, incinerators) compared to mobile sources, which would be the focus in analyzing the impacts of transportation projects.

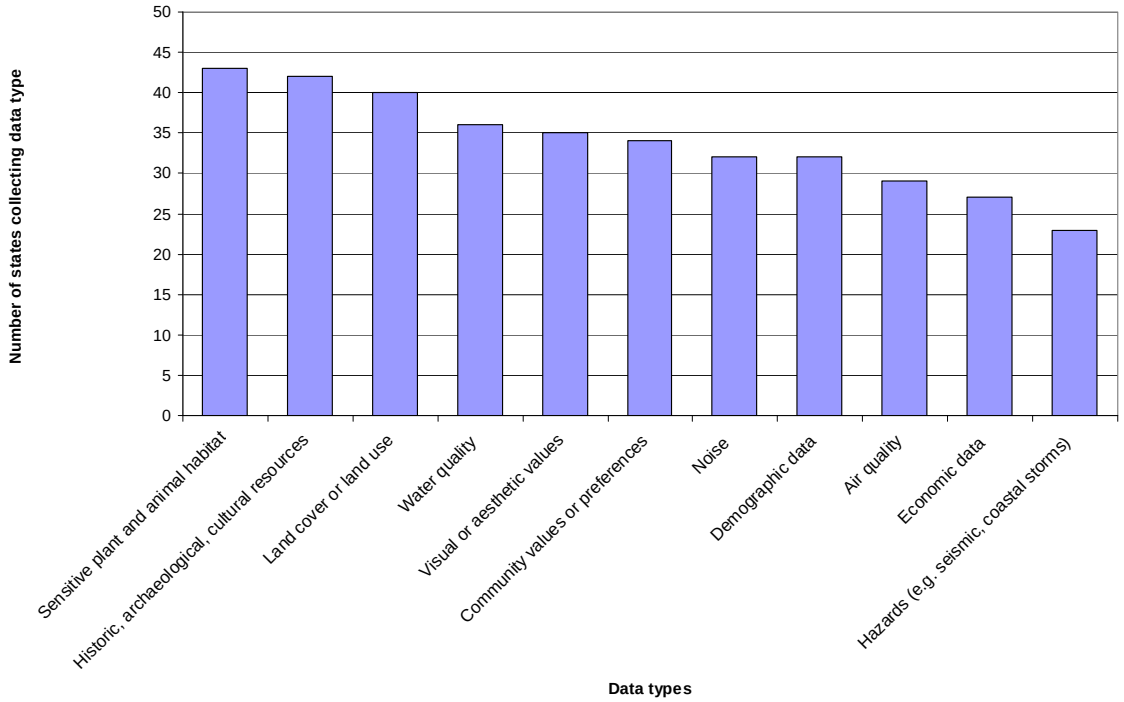

Figure 2. Data Collected in Scoping by the 46 Participating State DOTs.

B. Stakeholder Involvement

As discussed previously, there is some federal and state guidance which suggests the importance of engaging stakeholders in environmental review processes. Typically, at the scoping stage, DOTs engage with other agencies at the federal, state, regional, and local level. In addition, consultation with the public and organized public groups such as chambers of commerce, recreation clubs, homeowners associations, and environmental organizations. Key issues that will be examined relative to stakeholder involvement include the types of stakeholders included, stakeholder involvement techniques, the effectiveness of stakeholder engagement efforts, and the impacts of stakeholder involvement on the environmental review process.

Types of Stakeholders Involved in Scoping

As summarized in Table 1, there is relative consistency among the states in terms of who is involved. Among the 46 states that responded to the survey, only one state indicated that its DOT did not engage agencies in scoping efforts. Five states indicated that they provide no public involvement in scoping conducted during environmental review. For those states that utilize agency and public participation, it appears that a wide range of stakeholders are included. Table 1 provides information about which agencies, organizations, and other stakeholders are included in participation efforts conducted in state DOTs. Overall, there is strong participation among agencies, with over 90 percent of responding states engaging state (98%, 44 states), federal (96%, 43 states), regional (93%, 42 states), and local (91%, 41 states) agencies. However, only just over 70 percent, or 32 states, involved tribal governments. It may be that

staff in some states may not have been involved in projects that impacted tribal governments. For public participants, over 90 percent, or 37 states, consistently engage property owners, organized groups, elected officials, and the general public. Over 85 percent of the states that engage public participants, 35 out of 41, include business owners among participants.

Table 1. Types of Stakeholders in Scoping Processes

Agency Participants	*% of State DOTs Engaging Participants[1] % (#)*
State (e.g. natural resources agency, pollution control agency)	97.8% (44)
Federal (e.g. U.S. Fish and Wildlife Service, Army Corps of Engineers)	95.6% (43)
Regional (e.g. metropolitan planning organization (MPO), regional government)	93.3% (42)
Local (e.g. city, county, special districts)	91.1% (41)
Tribal	71.1% (32)
Public Participants	
Affected property owners	90.2% (37)
Organized groups (e.g. environmental organizations, chambers of commerce, recreation clubs)	90.2% (37)
Elected officials	90.2% (37)
General public	90.2% (37)
Business owners	85.4% (35)

[1]Among the states that indicated that they engaged agency (n=45) and/or public participants (n=41).

Stakeholder Involvement Techniques

The survey results, shown in Table 2, indicate that stakeholder involvement techniques vary significantly. The techniques used most frequently for agency engagement include meetings with staff from other agencies (96%, 43 states), followed by sharing data and providing invitations to open house or public meetings, at 80 percent (36 states) and 78 (35 states) percent respectively. The most common techniques used to engage and provide information to the public include open houses (93%, 38 states). Advisory or steering committees and project websites are used in 88 percent of the responding states, amounting to 36 total states. The least commonly used techniques include providing opportunities to review and comment on draft scoping documents and community surveys at 34 percent or 14 states. Charrettes and project hotlines were used in 32 percent, or 13 states. In general, a key finding to note is that agency stakeholders are more likely to be involved in more active participatory techniques such as meetings with staff and sharing data, whereas approaches to engage public participants were

often focused on information provision such as open houses and project websites. Advisory or steering committees may vary in terms whether they are active or more focused on information provision or distribution.

Table 2. Participation Techniques Used to Facilitate Agency and Public Involvement

Types of interaction between DOT and other agencies	*State DOTs Engaging Participants[1] % (#)*
Meetings with staff from other agencies	95.6% (43)
Sharing of data	80.0% (36)
Invitation to open house or public meeting	77.8% (35)
Review or comments on draft scoping document	66.7% (30)
Assistance in preliminary analysis of impacts	66.7% (30)
Techniques used to encourage public participation and distribution information to the public	
Open house	92.7% (38)
Advisory/Steering committee	87.8% (36)
Project website	87.8% (36)
Project newsletter	80.5% (33)
Meetings with groups or individuals from the general public (e.g. focus groups)	80.5% (33)
Public hearing	75.6% (31)
Direct mailings to property owners near project site	75.6% (31)
Media interviews/announcements	70.7% (29)
Participation in city council meetings	58.5% (24)
Computer-generated simulations of proposed facilities or impact	56.1% (23)
Review or comments on draft scoping document	34.1% (14)
Community Survey	34.1% (14)
Charrettes or other interactive design efforts	31.7% (13)
Project hotline/phoneline	31.7% (13)

[1]Among the states that indicated that they engaged agency (n=45) and/or public participants (n=41).

Effectiveness of Stakeholder Involvement Efforts

In the survey, the effectiveness of stakeholder engagement efforts was measured by asking DOT staff about their perceptions of efforts to engage or interact with stakeholders during scoping. The perceived effectiveness of engagement efforts was measured on a four point scale, with one representing "very ineffective" and four representing "very effective." A "not sure" response option was also provided, though no numerical value is associated with this response. These results are provided in Table 3. The mean effectiveness score were 3.08 for agency engagement and 3.05 for public engagement. In general, there is agreement that efforts to engage agencies and the public are effective, with over 83 percent of respondents indicating that agency and public engagement efforts are "effective" or "very effective." Only two states rated their agency engagement efforts as very ineffective and no states noted that the public engagement efforts were very ineffective.

Table 3. Perceived Effectiveness of Stakeholder Engagement Efforts[1]

	Very ineffective % (#)	Ineffective % (#)	Effective % (#)	Very effective % (#)	Not sure % (#)	Mean[2]
Perceived Effectiveness of Agency Engagement	4.3% (2)	6.5% (3)	56.5% (26)	26.0% (12)	4.3% (2)	3.08
Perceived Effectiveness of Public Engagement	0.0% (0)	2.2% (1)	73.9% (36)	10.8% (5)	2.2% (1)	3.05

[1]Among the states that indicated that they engaged agency (n=45) and/or public participants (n=41).
[2]Mean is calculated based on ordinal responses for those indicating a level of effectiveness on a four point scale. Those respondents indicating a "not sure" response were omitted from the calculation of the mean.

The effectiveness of efforts to engage stakeholders was also assessed by considering the presence of key inputs into stakeholder involvement efforts that make engagement or interaction more effective, such as staff commitment, resources, and level of understanding of scoping requirements. The survey respondents indicated a number of factors that contribute to the level of engagement described above. As shown in Table 4, level of DOT staff commitment appears to be most important in determining the effectiveness of efforts to engage agencies (73.9%, 34 states), while this factor is the second most important contributor to public engagement (71.7%, 33 states). For public engagement, level of interest among public stakeholders (82.6%, 38 states) appears to be most important to respondents' assessment of the effectiveness of engagement efforts. For agencies, the second most important factor contributing to the effectiveness of engagement efforts was the level of staff commitment in other agencies (69.6%, 32 states). This appears to be an issue of particular concern and is reflected to some extent in an open-ended response to the survey, which noted that resources and the quality of staff contributions from other agencies were important issues in determining effectiveness. For public engagement, the

open-ended portion of the survey also provided insights, noting that trust of the DOT by the public is important to the effectiveness of the transportation agency in engaging the public.

Table 4. Factors Influencing Effectiveness of Stakeholder Engagement Efforts[1]

	Agency Engagement % (#)	Public Engagement % (#)
Level of DOT staff commitment to engagement	73.9% (34)	71.7% (33)
Level of resources in DOT (e.g. time, money, consultant assistance) to facilitate effective engagement	54.3% (25)	52.2% (24)
Level of staff commitment in other agencies *or* interest among public stakeholders	69.6% (32)	82.6% (38)
Level of understanding of the purpose of scoping process among stakeholders	67.4% (31)	47.8% (22)

[1]Among the states that indicated that they engaged agency (n=45) and/or public participants (n=41).

C. Facilitation and Management of Scoping Processes

This section examines a variety of issues relating to DOTs' efforts to facilitate and manage scoping processes, including both internal and external factors faced by agencies. To examine this question, the survey posed a number of statements about potential challenges and asked respondents to rate them from one to five, with one representing "not challenging at all" to five representing "very challenging." Based on the responses summarized in Table 5 below, the biggest challenges appear to be related to stakeholder involvement including public opposition to proposed projects and getting other agencies and the public to participate. The least challenging factors appear to be internal to the DOTs including gaining DOT staff and management support and commitment to scoping and lack of internal DOT guidance related to scoping. One additional interesting finding to note is that amount of DOT staff and time available for scoping appears to be a bigger challenge than the amount of funding available for scoping, suggesting a potential problem with the allocation of resources to various activities. It is important to note that even those factors found to be most challenging may not qualify as major challenges for most state DOTs. The mean scores of near 3.0 or below suggest that across all DOTs, only a portion are experiencing major challenges relative to these factors.

Table 5. Challenges Faced by DOTs in Facilitating and Managing Scoping Processes

	Not challeng-ing at all % (#)	Minimally challeng-ing % (#)	Somewhat challeng-ing % (#)	Challeng-ing % (#)	Very challeng-ing % (#)	Not sure % (#)	Mean[1]
Public opposition to proposed projects	4.3% (2)	10.9% (5)	34.8% (16)	34.8% (16)	8.7% (4)	6.5% (3)	3.09
Getting other agencies to participate	13.0% (6)	13.0% (6)	45.7% (21)	15.2% (7)	10.9% (5)	2.2% (1)	2.87
Getting the public to participate	6.5% (3)	15.2% (7)	50.0% (23)	10.8% (5)	10.9% (5)	6.5% (3)	2.77
Availability of data	10.9% (5)	32.6% (15)	39.1% (18)	15.2% (7)	0.0% (0)	2.2% (0)	2.49
Amount of DOT staff available	17.4% (8)	30.5% (14)	28.2% (13)	17.4% (8)	4.4% (2)	2.2% (1)	2.48
Time available for scoping	15.3% (7)	28.2% (13)	36.9% (17)	15.2% (7)	2.2% (1)	2.2% (1)	2.47
Expertise of DOT mgmt.	17.4% (8)	47.9% (22)	19.6% (4)	8.7% (4)	2.2% (1)	4.3% (2)	2.12
Expertise of DOT staff	28.3% (13)	41.3% (19)	15.2% (7)	10.9% (5)	2.2% (1)	2.2% (1)	2.07
Lack of clarity in NEPA scoping regulations	30.5% (14)	34.8% (16)	28.2% (13)	2.2% (0)	2.2% (0)	2.2% (0)	1.97
Funding available for scoping	26.1% (12)	37.0% (14)	23.6% (11)	2.2% (1)	2.2% (1)	8.7% (4)	1.84
DOT staff support/ commitment to scoping	32.6% (15)	50.0% (23)	15.2% (7)	0.0% (0)	0.0% (0)	2.2% (1)	1.73
Lack of internal DOT guidance on scoping	45.7% (21)	34.8% (16)	13.1% (6)	2.2% (0)	2.2% (0)	2.2% (0)	1.69
DOT mgmt. support/ commitment to scoping	41.3% (19)	45.7% (21)	10.9% (3)	0.0% (0)	0.0% (0)	2.2% (1)	1.59

[1]Mean is calculated based on ordinal responses for those indicating a level of effectiveness on a five point scale, with one representing "not challenging at all" and five representing "very challenging." Those respondents indicating a "not sure" response were omitted from the calculation of the mean.

D. Scoping Outcomes

This section examined two key questions, including the effect of stakeholder involvement on scoping outcomes and the general effects of scoping on the content and outcomes of NEPA processes.

Effects of Stakeholder Involvement on Environmental Review Content and Outcomes
Relative to the effects of stakeholder involvement in scoping processes, the survey focused on the interrelated issues of the content of environmental review documents and outcomes of environmental review processes. The survey posed two questions to DOT staff to get at this issue. The first question asked respondent to indicate the extent of effects that they perceived stakeholders having on scoping content and outcomes. Secondly, respondents were asked to indicate specific types of content and outcomes that are affected by agency and public involvement, such as selection of alternatives, identification of impacts, and mitigation strategies. These questions were asked in the context of both agency and public stakeholders to achieve a comparison.

For the first survey question regarding the effect of agency and public involvement on content and outcomes, the survey included responses with effect ratings ranging from one for "no effects" to four for "substantial effects." A "not sure" option was also provided, with no numeric value associated with it. As shown in Table 6, the mean perceived effect scores are almost identical at 3.23 for agency involvement and 3.26 for public involvement. In terms of variation in the effects of agency and public stakeholders, there appears to be a slightly higher number of respondents that indicated "substantial effects" for agencies at 35.6 percent (16 states), compared to 31.7 percent (13) states indicating "substantial effects" for public participants. Despite the slightly higher number indicating substantial effects from agency involvement in scoping, 9.5 percent of respondents, or four states, indicated that agency involvement had "no effects" or "minimal effects" compared to just one state (2.4%) for public involvement.

Table 6. Perceived Effect of Stakeholder Interaction and Involvement on Content and Outcomes of Scoping Processes[1]

	No effects % (#)	Minimal effects % (#)	Some effects % (#)	Substantial effects % (#)	Not sure % (#)	Mean [2]
Effect of Agency Involvement	2.2% (1)	7.3% (3)	56.1% (22)	35.6% (16)	7.3% (3)	3.23
Effect of Public Involvement	0.0% (0)	2.4% (1)	65.9% (27)	31.7% (13)	0.0% (0)	3.26

[1]Among the states that indicated that they engaged agency (n=45) and/or public participants (n=41).
[2]Mean is calculated based on ordinal responses for those indicating a level of effectiveness on a four point scale. Those respondents indicating a "not sure" response were omitted from the calculation of the mean.

The second part of this analysis, focused on assessing the effects of agency and public involvement on key environmental review document content and outcomes, found some variation between the effects of agency and public engagement. These findings are illustrated in Table 7. Specifically, the effects of agency engagement are much more pervasive, with a higher percentage of states indicating effects in nearly all categories. There were particularly strong impacts of agency involvement in scoping on the selection of alternatives for evaluation in the environmental impact statement (EIS), at 100.0% or 45 states. Public engagement affected the selection of alternatives in 82.9% or 34 states. Agency involvement also had impacts on a number of other aspects of environmental review content and outcomes in over 80 percent of states, including identification of key impacts to focus on in the EIS, data to be considered in the EIS, identification of stakeholders, and mitigation strategies. The area of greatest effect for public participants was in identification of additional stakeholders in 85.4% or 35 states. As noted above, effects were also seen relative to the selection of alternatives. For agencies and to a higher extent for public stakeholders, participation appears to have the least effect on the methods and tools used in the EIS process.

Table 7. Environmental Review Content and Outcomes Affected by Stakeholder Engagement[1]

	Agency Engagement % (#)	Public Engagement % (#)
Selection of alternatives for evaluation in the environmental impact statement (EIS)	100.0% (45)	82.9% (34)
Identification of key impacts to focus on in EIS	86.7% (39)	75.6% (31)
Data to be considered in the EIS	84.4% (38)	70.7% (29)
Identification of additional stakeholders	84.4% (38)	85.4% (35)
Mitigation strategies	80.0% (36)	58.5% (24)
Transportation project types, designs, locations, or alignments	57.8% (26)	61.0% (25)
Tools or methods used for EIS	42.2% (19)	17.1% (7)
None of the above	2.2% (1)	0.0% (0)

[1]Among the states that indicated that they engaged agency (n=45) and/or public participants (n=41).

One additional interesting finding to note from the table is that public engagement appears to have a slightly greater effect on transportation project types, designs, locations, and alignments, as compared to agency engagement. This might be suggestive of the focused role that agencies play relative to particular resources (e.g. wildlife) or particular geographic areas of jurisdiction (e.g. scenic river corridor). The focus of agencies might be more focused on details of the environmental review, compared to a more general focus among public participants. The general public might be more likely to focus on the characteristics of the transportation project itself as a means of addressing their concerns.

Effects of Scoping on Environmental Review Content and Outcomes

Finally, the study concluded with an examination of the overall effects of scoping on later steps in the NEPA process, as well as broader outcomes including resource impacts, environmental protection, and the quality of transportation projects. The survey results related to these issues are summarized in Table 8.

First, in terms of the influence of scoping processes on the content of environmental impact statement (EISs) completed later in the NEPA process, there is relatively consistent agreement among state respondents that scoping processes are influential. As shown below, 30 out of the 46 responding states suggested that they agree that scoping is influential, with an additional 11 stating that they strongly agree, for a total of over 90 percent of the responding states. Only one of the responding states indicated disagreement with this statement.

In terms of the environmental impacts of scoping processes, there is also relatively strong agreement that scoping leads to better identification of the environmental impacts of transportation projects, with over 90 percent of responding states noting that they agree or strongly agree. There is slightly more variation among states in their responses to whether scoping leads to better mitigation of the environmental impacts of transportation projects. Twenty-four states, or about 52 percent of the responding states, agreed or strongly agreed that better mitigation was produced, whereas 22 states or 51 percent noted a neutral response or disagreement.

Relative to the internal effects of scoping that might be captured within an agency, the survey results provide insights into the potential for time and resource (e.g. staff, financial costs) that might be captured through scoping efforts. In general, the mean scores are lower at 3.00 for scoping decreasing the amount of time needed to complete the NEPA process and 2.43 for scoping decreasing the amount of resources needed to complete the NEPA process. The scale for these questions ranges from one to five with one representing strongly disagree and five representing strongly agree. For the time question, 17 states or 46.9 percent, strongly disagree or disagree with a statement that suggests that scoping decreases the amount of time to complete the NEPA process, which the same number agree or strongly agree. Twelve states indicated neutral responses to this question. For the companion question related to decreases resources required to complete the NEPA process, an even higher number of states, 28 out of the 46 responding states (nearly 61 percent), disagreed or strongly disagreed that resources needs decreased. Only nine states, approximately 20 percent of those responding, noted agreement or strong agreement.

Table 8. Effects of Scoping on Environmental Review Content and Outcomes

	Strongly disagree % (#)	Disagree % (#)	Neutral % (#)	Agree % (#)	Strongly agree % (#)	Mean[1]
Scoping influences the content of EISs prepared by the DOT	0.0% (0)	2.2% (1)	8.7% (4)	65.2% (30)	23.9% (11)	3.08
Scoping leads to better identification of environmental impacts of transportation projects	2.2% (1)	4.3% (2)	2.2% (1)	58.7% (27)	32.6% (15)	4.09
Scoping leads to better mitigation of environmental impacts of transportation projects	0.0% (0)	17.4% (8)	30.4% (14)	32.6% (15)	19.6% (9)	3.49
Scoping decreases the amount of time to complete the NEPA process	4.3% (2)	32.6% (15)	26.1% (12)	23.9% (11)	13.0% (6)	3.00
Scoping decreases the amount of resources (e.g. staff, financial costs) to complete NEPA process	15.2% (7)	45.7% (21)	19.5% (9)	15.2% (7)	4.3% (2)	2.43

[1]Mean is calculated based on ordinal responses for those indicating a level of effectiveness on a five point scale, with one representing strong disagreement and five representing strong agreement.

Overall, the findings presented in Table 8 above suggest that despite noting relatively positive impacts of scoping on environmental outcomes related to transportation projects, there may be concerns about the time and resources needed to complete scoping efforts. The study did not collect adequate information to be able to evaluate whether the negative time and resource impacts of scoping efforts are perceived to be worth the effort. Nevertheless, there appears to be strong influences of scoping efforts on the content of EISs prepared by DOTs, thus further emphasizing the importance of this early step in the NEPA process. The significance of the environmental impacts of scoping might justify further investments and allocation of time to support the completion of this step in the environmental review process.

V. Conclusions and Recommendations

The findings of this study provide important insights into the broad range of approaches to scoping used in state DOTs in the U.S. Further, the study provides an assessment of the effects of scoping and the challenges faced by DOTs in facilitating and managing scoping efforts. These findings provide an important national perspective in the implementation of NEPA, but also provide valuable information that can be used by individual DOTs to evaluate their own scoping practices. In addition, the findings point to some useful recommendations for state DOTs to consider as they evaluate and/or modify scoping practices.

- ***Data collection.*** The survey results suggest that DOTs collect numerous types of data as part of scoping processes. To ensure the broadest possible examination of relevant data, DOTs might consider ways to collect additional data that might be useful in scoping processes. While data available from natural resource and historic preservation agencies are often easily available, data needs may vary by project. Working with other agencies, especially local government and regional agencies might point to important information about demographics, economics, noise, air quality, and hazards that might not be readily available from agencies that traditionally participate in environmental review.

- ***Stakeholder involvement.*** Despite the general guidance is provided by NEPA, federal agencies, and SAFETEA-LU, there appears to be some variation among states related to the involvement of stakeholders. While most state DOTs engage both agency and public stakeholders, there are some states that still do not promote participation in this initial phase of environmental review. It is possible that these states engage stakeholder later in the process. However, the clear evidence provided in this study related to the effects that stakeholders can have on environmental review content and outcomes, suggests the importance of early engagement. More specific guidance and/or enforcement of existing rules may be required to ensure consistent application and opportunities for stakeholder participation.

- ***Participation techniques.*** The study highlights the extensive outreach that is conducted by state DOTs to various types of agency and public stakeholders. Such broad participation should be continued. At the same time, successful techniques used to engage stakeholders should be documented and shared within and among DOTs. Creating an internal guide to participation, such as Mn/DOT's *Hear Every Voice* document may be one approach. Another option is to create a clearinghouse for information on participation techniques. Such an effort might be facilitated by FHWA, with a website summarizing relevant case studies as the agency does for other topics including environmental justice (FHWA 2000) and economic development cases (FHWA 2007).

- ***Facilitating and managing scoping.*** Among the key challenges that state DOTs face in facilitating and managing scoping processes, is getting the public and other agencies to participate, as well as dealing with public opposition. Providing multiple opportunities or venues for participation might be one approach to maximize public involvement. To address the specific issue of public opposition, engaging public stakeholders as early as

possible in the scoping process can be helpful in ensuring participants feel that they have a stake in the project and that a decision has not already been made. Clearly articulating the purpose and steps in the NEPA process can be especially important for public participants, who may not be familiar with the process, their role, or opportunities to intervene. Other lesser challenges, but still notable, include the amount of staff and time available for scoping efforts. These two issues seem to be more significant than the availability of funding. State DOTs might assess their resource use to allocate a sufficient amount of personnel for scoping. In addition, examining the amount of time budgeted for scoping in the overall NEPA process, will be helpful in ensuring this early and important step is not overlooked.

- ***Effects of stakeholder involvement.*** The impacts of stakeholder involvement on the content and outcomes of environmental review are clearly illustrated in this study. The findings suggest that agency participants typically have a greater role influencing content, particularly more technical aspects of the environmental review document, whereas public participants are more focused on process issues and broader concerns including the type and design of the transportation facility. The magnitude of the impacts suggests the importance of continuing extensive stakeholder involvement. Specific to public involvement, DOTs may seek opportunities to engage the public more fully on technical questions. Providing more detailed technical information to react to and facilitating meetings that allow interaction between DOT and other agency experts to allow mutual learning are two potential approaches to consider. As public participants develop a better understand of the details of the environmental review process and the type of environmental analyses completed, they might be able to contribute in a more meaningful manner.

- ***Effects of scoping on environmental review content and outcomes.*** The findings clearly suggest the important role that scoping plays in shaping environmental review content and outcomes, as well as improving the identification and mitigation of environmental impacts. However, there appears to be concerns about the amount of time and resources required to complete scoping efforts. Considering the significant positive environmental impacts, the investment of time and resources appears justified and might be used as evidence in pursuing additional staff time and other resources needed to complete meaningful scoping efforts.

As noted above, this study provides a useful picture of the state of the practice in scoping in NEPA environmental review processes for transportation projects. The findings are based on input from 46 of the 50 states and thus provide a relatively comprehensive look into the day-to-day practices, as well as the impacts of those practices. The study provides clear justification for ample stakeholder involvement, as well as the investment of agency resources into scoping efforts. The effects of scoping on later steps in the environmental review process are clear. Careful attention to the design and management of scoping processes, considering factors both within and outside of the agency that can be influence scoping outcomes, can produce better transportation projects with fewer environmental impacts.

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