

JOINT TRANSPORTATION RESEARCH PROGRAM

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Pre-Contract Project Scoping Processes: Synthesis of Practices

Introduction

Scoping is the process of developing a project's objectives, need, preliminary cost estimate, and preliminary schedule based on a recognized need that the project is intended to address. Scoping includes the preparation of engineering assessments, conducting field inspections, collection and analysis of data to screen a range of alternatives, summaries of the design decisions and preliminary environmental reviews. This study (SPR-3944) was launched by the Indiana Department of Transportation (INDOT)/Joint Transportation Research Program (JTRP) to develop a synthesis of scoping processes in different state highway agencies (SHAs). The study was conducted in parallel with project SPR-3948, *Pre-Contract Scoping Processes Value Stream Mapping*, which focused on the analysis of pre-contract scoping as a business process in order to identify opportunities for process improvements at INDOT and to then help implement these process improvements.

This study was conducted using a qualitative exploratory approach focusing on the review of project scoping practices across different SHAs. Focused interviews with personnel from SHAs, along with the review of documents gathered during the literature search and resources provided by SHAs, were the avenues used for data collection.

Findings

This study focused on 11 themes for the assessment of project scoping procedures: (1) primary entity with responsibility for scoping projects, (2) timeline for scoping activities, (3) functional groups within the SHA involved in scoping, (4) cost estimation procedures, (5) application of Context Sensitive Solutions (CSS), (6) addressing maintenance needs, (7) methods of assessing scope creep, (8) tracking the quality and effectiveness

of scoping processes, (9) environmental consideration in scoping processes, (10) data collection and data sharing, and (11) scoping practices which have evolved/benefited the SHA.

The key findings are summarized as follows:

- There was no common pattern for scoping practices across SHAs. The entity responsible for scoping maintenance activities and the processes used for scoping maintenance activities are different across SHAs.
- Documents obtained from the Washington State DOT, Minnesota DOT, and California DOT indicate strong links between planning and programming of projects at these SHAs.
- Most SHAs use the American Association of State Highway and Transportation Officials (AASHTO) cost estimation guideline. Right of Way (ROW), utilities, and construction cost estimation are the major elements of the initial cost estimate during scoping phase.
- SHAs recognize that ROW cost estimation has a high degree of risk and contingency.
- The time and degree of stakeholder involvement and public outreach during the early stages of the scoping process varies from agency to agency.
- SHAs follow different practices for assessing scope creep, ranging from the active involvement of project managers across the project cycle to the use of staged funding approaches and project review boards.
- Although the SHAs stated that the monitoring of cost estimation between scoping phase and construction phase provides a general overview of the scoping performance, most of the SHAs interviewed in this study did not have defined metrics or a formal policy to assess the quality and effectiveness of their scoping procedures.

- Typically, SHAs follow the National Environmental Policy Act (NEPA) processes for environmental analysis during the scoping phase. Environmental assessment during this phase depends on the type of project and varies from agency to agency.
- Most of the SHAs are very proactive in data collection and data sharing during the scoping phase of the project. Different types of data are collected and shared among personnel of each DOT (both at the district level and in the central office). Project Wise is the most popular database software system among SHAs.
- Scoping practices that were beneficial to SHAs included (a) well-developed scoping/project development documents (California DOT, New York State DOT, Utah DOT), (b) early implementation of Practical Design, (c) using a staged approach to reduce scope creep (Maine DOT), and (d) consistent mechanisms/processes used by regions and van tours/field reviews for assessing candidate projects (Michigan DOT).

Further Investigation

The following suggestions are presented for further investigation by INDOT:

- Conduct follow-up interviews with Texas DOT, Minnesota DOT, Utah DOT and Washington State DOT to determine (a) when full scopes are determined and (b) when and how budgets are set.
- Conduct a follow-up interview with Kentucky DOT to (a) obtain clarification regarding primary entity responsible for scoping, (b) determine how Planning Liaisons facilitate the scoping process, and (c) determine what scoping is done to select projects for the District Transportation Plan (DTP) and the State Highway Plan.
- Develop a Scoping Functional Group (consisting

of representatives from INDOT districts) that can further review relevant scoping documents from other SHAs for adoption/adaptation at INDOT.

- Develop and provide training to INDOT personnel involved with scoping, and create collaborative platforms for sharing data and lessons learned during project scoping.
- Develop a consistent definition for scope creep/change and communicate reasons for changes in project estimates (understanding the need to increase confidence in the cost estimate and maintain the trust of stakeholders).
- Develop and evaluate a mechanism for creating early-stage project scopes for different types of projects.
- Evaluate the viability of including risk analysis tools to ensure more effective and transparent cost estimating.
- Review the Final Report and Guidebook of the NCHRP Study 08-88 (Report 821), *Effective Project Scoping Practices to Improve On-Time and On-Budget Delivery of Highway Projects*, for more information about scalable scoping templates.

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