
Executive Summary

Transportation projects require significant investments of funds and resources. The cost of these projects includes not only the cost of construction but also the cost of project development, including scope development, environmental review and mitigation, preliminary engineering, right-of-way, utilities, final design, public engagement, and construction engineering. These costs of project development are a significant percentage of the total cost of transportation projects.

While agencies have devoted much time, effort, and expense to estimate the cost of construction, it is believed that the estimation, budgeting, and tracking of project development costs can benefit from improved processes. The purpose of this domestic scan is to identify successful approaches to setting project development budgets.

The scan team heard online presentations from 13 transportation agencies regarding their methods, tools, and processes for estimating, budgeting, and tracking the cost of project development for transportation projects.

Summary of Findings

Findings and observations were noted following each presentation as roses (successful processes), buds (new ideas with promise), or thorns (challenges to be addressed). One week after the presentations had been completed and the roses, buds, and thorns were recorded, the scan team met to finalize its list of findings. These findings and examples from the agency presentations were placed in categories (general observations, scope development, cost estimating, risk, dashboards, tools and data systems, contractor involvement, communication, and miscellaneous) in order to compare the variety of methods, procedures, and tools used by these agencies.

Recommendations

The following are the scan team's recommendations based on findings determined from presentations and materials provided during the scan and finalized during a scan team meeting.

Scoping/Cost Estimating

- The use of standard templates, data systems, and tools for project scoping and cost estimating is a best practice that should be employed.
- It is recommended that manuals developed to guide the scoping process require a review of statewide plans and standards to ensure the consistency of project scopes with those documents.
- The use of an early PE phase as part of the development process prior to programming the construction phase is recommended for more complex projects to identify issues early on, such as environmental risks and potential right-of-way acquisition.

- The use of an owner’s scope contract performed by a consultant to perform scoping and cost estimating can be beneficial in providing a different perspective and supplementing in-house resources.
- The use of former construction estimators or consultants with expert knowledge from a contractor’s perspective to verify estimates, schedules, and review constructability can help to provide a valuable second opinion.
- Sharing planning level tools for scoping and estimating with local agencies can improve Department of Transportation project proposals.
- Agency cost estimating manuals and materials should be developed and updated regularly.
- The use of a flat percentage of construction costs for estimating the cost of project development and CE phases based on historic averages is an appropriate tool to use for typical non-complex projects with significant construction cost histories.
- A uniform policy on escalation (e.g., inflating costs to the midpoint of a phase) is recommended to provide consistent guidance across all projects. (Training and guidance should be considered to assist project managers.)
- Cost estimating programs and systems should capture history and assumptions for future reference. The basis of the estimate should be updated at milestones, regular reviews, or annually, whichever comes first.
- Focus more attention on those 20% of bid items that result in up to 80% of costs or higher risk during scoping and project development.

Risk-Based Analysis

- Estimates and budgets should include risk-based contingencies to account for unknown and identified risks.
- Scheduled risk analysis should be considered for high-profile and complex projects.
- Development of a robust risk assessment approach that is scalable to total project cost and/or complexity is recommended.
- A project closeout process that documents lessons learned, actual resources used, and the effectiveness of the ways that anticipated risks were eliminated or mitigated is recommended.
- Consider using a separate risk contract to evaluate risk and quantify outside factors that might impact the project’s cost or schedule.

Budgeting/Tracking

- While the cost of construction is a major portion of project costs, the cost of project development is significant and should also be considered and budgeted.
- Dashboards and tools to budget and track project development costs in addition to construction costs will communicate progress to decision-makers and the public and assist agencies to identify actual resource needs to deliver the program.

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- Project costs should be compared to planning estimates to identify problems early so that necessary action can be taken proactively.
 - A change management process should be employed to aid in proactively managing project budgets and schedules that enable programming staff to better manage overall program budgets. An efficient change management process will keep the project management focus on delivering the project and provide accountability and transparency.
 - Implementation of Earned-Value (EV) analysis that provides regular reports and ties schedules and resources can be beneficial in identifying potential problems early on.
 - For work done by agency staff, it is important to establish a mindset of an owner-operator to effectively budget and track in-house project costs. A balance should be struck between an owner-operator mindset, where staff tend to spend as much time as needed to deliver near-perfect products, and the need to work within established budgets.

Tools and Data Systems

- Programs and systems that “talk” to each other are beneficial in sharing information and saving historic data for future reference.
- It is important to consider technology costs, security of data, maintenance, and the quality of data.
- Updating and replacing legacy project development systems is important but costly and time consuming and should be done with significant planning and deliberation.

Communication

- Peer exchanges with transportation agencies and contractors to discuss project development and construction are both beneficial and encouraged.
- Consider a strategy for communicating the accuracy of project costs when releasing information on risk-based contingencies and cost estimates to avoid implying unwarranted accuracy.
- Agencies should define the terms used in project development and be consistent in communicating them.

Finally, an implementation strategy is presented to share findings and recommendations of the scan with others in the transportation community.