Project Summary

Texas Department of Transportation

0-4661: Monitoring and Evaluation of SH 130 Project Construction

Background

In the United States, highway projects have traditionally been delivered through the Design-Bid-Build (DBB) project delivery method, which procures engineering and construction services independently. Recently, Departments of Transportation (DOTs) have begun evaluating several alternative delivery methods that integrate the delivery of more services under the umbrella of fewer service providers. The Design-Build (DB) delivery method, especially, has been increasingly adopted by DOTs in the United States. This method, in contrast to DBB, combines the procurement of construction services with a variable amount of engineering services in one contract.

The introduction of this alternative delivery method into a DOT project delivery toolbox demands the development and implementation of several practices representing, for many agencies, a paradigm shift away from their normal operating procedures. The problem of implementing such change has two main dimensions: (1) at the organizational level, the increase of delivery options provides challenges and opportunities to DOT decision-makers; (2) at the project level, once a new delivery method has been selected, there is the need to identify practices for its implementation. In an earlier research effort (research project 0-2129), researchers investigated challenges related to the first problem and provided recommendations for implementation at the organizational level. To investigate challenges at the second level of implementation and identify lessons learned, this research project observed activities for three years on the State Highway 130 (SH-130) project, which represents the first implementation of the DB method by the Texas Department of Transportation (TxDOT).

What the Researchers Did

The research effort was conducted on a multi-objective agenda to investigate various issues related to the adoption of the DB delivery approach for the delivery of a large highway project. First, researchers investigated issues and lessons on contract procurement activities. As a result, a model of the new procurement process was developed and an analysis of the contractual agreement was conducted. A set of lessons learned by TxDOT during the procurement of the SH-130 project was also identified. Later, researchers investigated issues and lessons on contract administration activities. The outcome of these investigations was a set of recommendations for organizing DOT project teams and managing the communication flows between project parties.

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To communicate SH-130 innovations and emergent practices statewide, researchers and Austin-based TxDOT staff organized a teleconferenced workshop. This workshop was attended by about 200 TxDOT employees from more than 20 locations. Videos of the event were edited and assembled into a CD to provide a training tool for TxDOT employees.

Finally, researchers identified a set of metrics to benchmark the implementation of the DB method and began collecting data on peer-projects both in and out-of-state. A Lessons-Learned System was also developed and populated with more than one hundred lessons collected during the investigations.

What They Found

The implementation of a new delivery method such as DB in an organizational environment where DBB is an institutionalized practice involves significant modifications to existing work processes and organization structures and the need to counter substantial resistance to change. Specifically, the project level is one area where such resistance occurs. As opposed to top managers who are aware of global change initiatives, project-level personnel operate on established organizational routines designed for maintaining traditional roles and responsibilities. When a new approach is employed, existing routines can actually inhibit the desired transformation from moving forward. In addition, the decades-long practice of delivering projects through DBB has established cultural barriers. While such resistance can constitute a serious challenge to implementation, the researchers found two challenges that demanded senior management effort in order to ensure a successful project: (1) transferring organizational goals for change into project practice, and (2) establishing new organizational routines to facilitate organizational-wide programmatic implementation.

What This Means

The adoption of the DB method needs to be planned and sustained by organization management, and a set of industry practices needs to be identified and adapted to the organizational environment.

- Internal and external project stakeholders need to be educated on these practices to decrease resistance.
- Knowledge of the DB method needs to be collected to close the information loop between project and organization levels and to develop organizational training.

An assessment of the implementation effort is necessary to identify needed adjustments at the project level and to provide organizational stakeholders with quantitative measures of the effectiveness of different delivery methods under different circumstances. This quantitative information will support future decision-makers in making early, informed decisions on preferred project delivery approaches.

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