

**CONTRACTING METHODS FOR ACCELERATED BRIDGE
CONSTRUCTION PROJECTS: CASE STUDIES AND CONSENSUS
BUILDING**

**Quarterly Progress Report
For the period ending November 30, 2019**

Submitted by:
PI- Katelyn Freeseaman and Jennifer Shane
Graduate Student- Michael Volk

**Affiliation: Department of Civil, Construction and Environmental Engineering
Iowa State University**



**ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER**

Submitted to:
ABC-UTC
Florida International University
Miami, FL

1. Background and Introduction

Accelerated bridge construction (ABC) is the solution of choice to upgrade substandard bridges, while maintaining traffic flow and optimizing safety through work zones. However, the perception of higher construction costs for ABC versus conventional construction continues in spite of numerous ABC projects having lower construction costs relative to conventional construction. This inaccurate perception and the fear of cost overruns are causing some bridge owners to be hesitant about using ABC technologies, especially those technologies related to bridge system moves which can provide the greatest benefit for safety and traffic flow impacts.

Whether to use ABC for a specific project needs to be decided at the project development stage. Research is needed to assist state DOTs in identifying contracting methods which have been utilized for ABC projects in the past, including lateral slides, longitudinal launches, and self-propelled modular transporter (SPMT) moves. Moreover, identifying successful contracting methods used for previously completed ABC projects will further encourage agencies to consider implementing accelerated construction practices for future project needs. This project will focus upon consensus building of contracting methods for ABC projects, as well as exploring potential advantageous alternatives when possible.

2. Problem Statement

While ABC projects are well-known for their abbreviated construction timelines with respect to traffic impediments, these types of projects are also associated with significantly greater construction costs. This perception is not always true, and can be dispelled via thorough documentation of key project development tasks related to contracting and bidding methods to allow for an accurate portrayal of ABC project costs.

One such hurdle in accurately estimating ABC project costs is the range of contracting methods utilized by agencies. While Design-Bid-Build (DBB) has conventionally been used for construction project, Design-Build (DB) and Construction Manager General Contractor (CMGC) project delivery methods have risen in popularity. These alternative contracting methods have shown to provide many benefits, though little research focus (for example, on the effective practices of successful CMGC projects) has been given due to limited experience and information available.

3. Research Approach and Methods

The proposed research project will consist of a thorough exploration of current contracting methods for ABC projects. This will be accomplished via surveys, case studies, content analysis, interviews, documentation and observations, as outlined in the following sections. It is anticipated that this effort will coincide with a separate proposal from the research team regarding bid items and the bidding process for ABC projects.

4. Description of Research Project Tasks

The following is a description of tasks carried out to date.

Task 1 – Literature Review

To prepare the current proposal, the research team has conducted a preliminary review of relevant studies and projects completed to date. For Task 1 of this project, the research team will compile all related information available in journals, conference proceedings, and technical reports in a concise and comprehensive summary. The main objective of this task is to obtain an exhaustive understanding of current contracting methods used for accelerated construction, with an emphasis on key project characteristics which affect their applicability.

The draft literature review is complete and will be included in the final report.

Task 2 – Information Collection

While Task 1 focuses upon extracting relevant material from documented sources, Task 2 will involve survey responses and interviews to collect pertinent information from state and local governments, as well as consultants/contractors when possible and beneficial, with respect to ABC project information. This project information will include bidding and contracting methods, as well as closure time determination processes. The research team understands the importance of both the quantity and quality of data that is obtained, as the project's success depends upon this information. The following states are acknowledged for their past ABC projects by the ABC-UTC and will thus be contacted as part of this task:

- Iowa
- Massachusetts
- Michigan
- Minnesota
- Oregon
- Texas
- Utah
- Vermont
- Washington State
- Wisconsin

Other entities will also be contacted to ensure that an exhaustive data set is acquired. In addition to gathering important project-specific information, the research team will also communicate with agencies who have implemented ABC projects to determine what gaps exist in determining actual ABC construction costs. The results of this information collection will also be incorporated into project-specific case studies. An element of the contracting and bidding process that will also be given attention and proper documentation is associated contract provisions, including incentives/disincentives (I/D), payment for acceleration, and other applicable methods.

Task 3 – Exploration of Contracting Methods

This task will use information collected from Tasks 1 and 2 for the comparison of contracting methods for ABC projects. It is anticipated that methods to be addressed will include Design-Bid-Build (DBB), Design-Build (DB), and Construction Manager General Contractor (CMGC) project delivery methods. The evaluation of these methods will include common project size (cost), project types (scope), characteristics in schedule, constraints and any special

requirements. To encourage the use of ABC, emphasis will also be given on any correlation between closure periods and bid items associated with the identified contracting methods.

The draft case study documents are complete and were reviewed by the advisory panel. Comments were addressed and the revised case studies will be included in the final report. The following case studies were included in this project:

- Minnesota DOT: Larpenteur Avenue Bridge
- Minnesota DOT: Keller Lake Bridge
- Indiana DOT: I-70 over 121 Bridges
- Georgia DOT: Courtland Street Bridge

In addition to collecting information for these case studies, other agencies were interviewed in order to gather best practices regarding alternative delivery methods. Those agencies included the Utah and Colorado DOTs.

Task 4– Summary of Successful Practices

The efforts associated with Tasks 1 through 3 will be summarized to highlight those methods deemed most successful in past ABC projects. This task will also serve as guidelines for agencies who have not yet implemented ABC projects, encouraging agencies to implement best practices for future applications.

The identified best practices will be included in the final report.

Task 5– Final Report

The project findings from the previously identified tasks will be prepared by means of a final report. This document will include the identified best practices, case studies, and other key project findings.

A draft final report was completed and has been sent to the advisory panel for feedback. Comments were received and are currently being addressed. The final report will then be finalized and posted to the website.

5. Expected Results and Specific Deliverables

As a result of this research effort, an ABC-UTC guideline for best practices for the selection of contracting methods will be developed for use by agencies in future ABC projects. These guidelines will be based upon case studies, highlighting past successes on ABC field implementations.

6. Schedule

Progress of tasks in this project is shown in the table below.

Item	% Completed
Task 1: Literature Review	100%
Task 2: Information Collection	100%
Task 3: Exploration of Contracting Methods	100%
Task 4: Summary of Successful Practices	100%
Task 5: Final Report	98%

	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Task 1	█	█	█															
Task 2	█	█	█	█	█	█												
Task 3							█	█	█	█	█	█	█	█				
Task 4													█	█	█			
Task 5															█	█	█	█