

Utilizing Alternative Technical Concepts for Design-Bid-Build Construction Projects (SEP-14) FY 2021-FY 2022 Program Update

Purpose and Scope

The Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) have entered into a programmatic work plan agreement to approve the use of Alternative Technical Concepts (ATC) on any federally-eligible Design-Bid-Build construction projects when deemed appropriate and beneficial according to the guidelines set forth in MoDOT's [Engineering Policy Guide \(EPG\), Article 147.1](#). With this agreement, MoDOT and FHWA agree to programmatically approve the use of ATCs, a form of "innovative contracting" identified under the FHWA's SEP-14 program, without requiring a specific work plan and approval for each individual project.

Introduction

An ATC is a proposed change to agency-supplied base design configurations, project scope, design criteria or construction criteria. This change provides a solution that is equal or better to the requirement in the contract. In the broadest sense, ATCs are similar to value engineering, but they are made as a part of the bid proposal before contract award. ATCs provide flexibility to the bidders in order to enhance innovation and achieve efficiency. MoDOT has successfully used ATCs on a handful of projects since 2010. To assist in determining whether or not to pursue ATCs, MoDOT has published [Guidelines and Procedures](#) in the EPG. Additional resources include a [white paper](#) on the standard ATC contracting process and a list of [frequently asked questions \(FAQs\)](#).

MoDOT routinely performs a Project Delivery Determination process which includes a high-level risk assessment on projects that provide opportunity for significant value as a result of contractor input. The Project Delivery Determination includes evaluation of opportunities and obstacles attributed to both Design-Build and Design-Bid-Build. This information is used for decision making on choosing the appropriate delivery method for projects.

Following the decision to utilize Design-Bid-Build based on the outcome of the Project Delivery Determination on a project the owner should consider utilizing the Design-Bid-Build ATC process if the following conditions are present:

- a) Risks identified in the Project Delivery Determination are appropriate for this approach.
- b) The owner desires to achieve significant value from contractor input.
- c) Industry is acceptable to the approach.
- d) Owner resources are available.

Federal Fiscal Year 2021-2022 Reporting

No Projects were delivered in FY 2021 using Design Bid-Build with ATC's. In FY 2022, only one project was attempted to be delivered using Design-Bid-Build with ATC's. The Route 86 Taney

County Bridge over Table Rock Lake in the Southwest District. The bids came in over program and were rejected and later re-bid using traditional design-bid-build contracting method. See attached report.

Performance Measures and Reporting

Tracker Measure 3f – Innovative Contracting Methods and Value Engineering is MoDOT's performance measure that captures use of Design-Build, A+B Contracting, and Design-Bid-Build ATC at MoDOT. The target is 10% of MoDOT's total program be used on innovative contracting. MoDOT's Tracker can be found at <https://www.modot.org/innovative-contracting-and-value-engineering-3f>. Measure 3f is located in the Deliver Transportation Solutions of Great Value section.

No Design-Bid-Build ATC Projects were delivered in FY 21, but MoDOT used innovative contracting on 7 of the 423 Projects delivered in the fiscal year. In fiscal year 2022, three Design-Build projects were awarded in the Central, Southwest, and St. Louis Districts. The I-70 Missouri River Bridge at Rocheport will be replaced with two structures along with improvements to the Route B interchange in Central Missouri. The I-44 Corridor Bridge Bundle is a program to replace 16 bridges and rehabilitate another nine within the I-44 corridor on routes between Springfield and Joplin. The I-70 Cave Springs to Fairgrounds project will make improvements to address the connectivity, safety and congestion at interchanges in the corridor. This partnership with the local community used an extensive public engagement to bring prioritized improvements to the community. **MoDOT attempted to use the ATC Process to deliver the Route 86 Bridge over Table Rock Lake in the Southwest District.** The bids came in over program and were rejected and later re-bid using traditional design-bid-build contracting method. MoDOT used innovative contracting to deliver 12 of 312 projects in FY 22 accounting for approximately 28% of the \$1.3 Billion Program. The 2 projects per year and 10% of program value targets were achieved.

Industry Reaction

No debrief was held following the award of the Taney 86 Project.

Alternate Technical Concepts Proposed

Since the ATC was not successful, the proposed ATC cannot be shared as MoDOT does not own the idea.

Cost and Time Savings

This period, no cost or time savings were realized.

Lessons Learned (To Date):

- Although this project worked out well from a cost savings standpoint, this project may have been a great candidate for a CMGC process or Progressive Design-Build. Additional value may have been realized during the procurement with one of these procurement methods.
- We would suggest a detailed risk assessment be performed on ATCs to identify and assign risk to the appropriate party (MoDOT or Contractor). If this is done early, there could be more interest in the ATC process.

- Contractors need to know the risks they are assuming for using an approved ATC. Make it clear that the contractor can rely on MoDOT's estimated quantities for areas of the project or bid items that are not touched by the ATC. A contractor will price risk for quantities their engineer and the contractor's staff did not develop in relation to the ATC. Make this clear in the Guidelines and Procedures Document.
- The program budget was very dated and not even close to Contractors base plan estimate. This led to a concern whether the project would be awarded if more than 10% over the budget, even with ATC savings.
- Hiring a design firm to assist is costly. If the low bid is not awarded that is a sunk cost that is hard to recoup.
- Starting the process with a complete set of plans requiring no additional edits and a well thought out Guidelines and Procedures document would allow for streamlining of the process.
- If updates to the base plan set are needed, have those completed before the ATC process starts. Limit changes late in the process, particularly with any plan quantities.
- Limiting ATCs to three means one of two things will happen. 1) MoDOT will not realize all the potential financial benefits of the ATC process or 2) Smaller ATCs are bundled which can be confusing as it relates to the projected savings and bid submittal.
- Using the ATC process is not a direct replacement for using Design-Build to get Contractor input in a project. The ATC process is much more limited in comparison. Owners should carefully weigh.



Missouri Department of Transportation

Final Report:

ATC Contract for: Job Number J7S3194, 86 Long Creek Bridge

Letting Date: April 15, 2020

Award Date: May 26, 2022

Report Date: October, 13 2022

A. Project Description

The Scope of this project is to replace Bridge A0590 across Table Rock Lake in the Southwest District near Branson, Missouri. Replacing the bridge parallel to the existing structure will allow for traffic to remain open during construction. Bridge A0590 in 2019 was shut down for urgent repairs and is at the end of its useful life.



B. Project Delivery Method Determination

A team of Southwest District Staff met and performed a Project Delivery Determination (PDD) on Route 86 Table Rock Lake Bridge (J7S3194) on October 25th, 2019. Based on the analysis of

the opportunities and obstacles of each project deliver method over eight factors, as well as performing a high-level risk assessment, both Design-Build and Design-Bid-Build are appropriate for this project.

PROJECT DELIVERY METHOD SUMMARY		
	DBB	DB
1. Project Complexity & Innovation	+	+
2. Project Delivery Schedule	++	+
3. Level of Design	++	+
4. Project Cost Considerations	+	+
5. Risk Assessment	+	+
6. Staff Experience/Availability (Agency)		-
7. Level of Oversight and Control	N/A	N/A
8. Competition and Contractor Experience	N/A	N/A

After considering the findings of the PDD workshop report from this meeting the District decided to select a Design-Bid-Build with Alternative Technical Concepts provision.

C. Alternative Technical Concepts (ATCs)

Note: Some information has been omitted in this report due to privacy of the ATC process as a result of the non-ATC bidder being read low.

General Requirements:

The MoDOT furnished Base Plans contain all of the proposed work for the project to be bid, however the proposer may elect to propose ATCs in lieu of certain items in the Base Plans. If an ATC is pre-approved by MODOT and FHWA-MO then the bidder has the option of submitting a bid for the Base Plans, or for the Base Plans as modified by the ATC. The bidder will only be allowed to submit one bid for the project.

ATCs submitted by the bidder shall be pre-approved by MoDOT and FHWA-MO prior to submitting with the bidding documents.

ATCs shall have a minimum of \$200,000 in cost savings. Cost savings shall include engineering costs for developing biddable quantities and final plans if the bidder is awarded the contract. Cost savings can include the combined savings of up to two (2) approved ATCs.

ATC Goals:

- Complete the project on schedule and on budget.
- Construct a facility that adequately and safely serves the transportation needs of local and regional travelers and promotes economic development and tourism.
- Minimize public impact by keeping traffic flowing safely and efficiently through the impacted area during construction.
- Incorporate innovative design and construction techniques.
- Demonstrate quality construction to provide a long-lasting facility requiring minimal future maintenance.

Schedule:

Date	Milestone
December 21, 2020	Blast email sent to contractors and design consultants announcing industry informational meeting. Draft ATC guidelines and procedures posted to the MoDOT Contractor Resources website and on project SharePoint site.
January 11, 2021	Industry informational meeting held virtually to outline the project, explain the ATC and bidding processes, present the draft ATC guidelines and submittal schedule, and answer questions.
January 12, 2021	Post the following to secure project SharePoint site: list of attendees from industry meeting, as-built plans, right-of-way plans, design criteria, alignment study, bridge memo, preliminary bridge plans, preliminary geotech information, design exceptions, and RER/completed CE.
January 22, 2021	Final ATC guidelines & procedures and draft geotech report posted to secure project SharePoint site.
February 8, 2021	First day for proposers to submit conceptual ATCs for review and pre-approval and begin one-on-one confidential meetings.
March 12, 2021	Last date of one-on-one confidential meetings.
March 19, 2021	Last day to submit CATCs.
April 16, 2021	Last day of notification to proposer(s) of approved CATC(s).
June 11, 2021	Last day to submit ATCs.
July 9, 2021	Last day of notification to proposer(s) of approved ATC(s).

September 10, 2021	14 weeks before the letting - Final plans, specifications and estimate due to District Office and Bridge Division for review.
October 8, 2021	10 weeks before the letting - Signed and sealed plans and job special provisions due to Central Office Design and FHWA for review.
TBD	Pre-Bid Meeting
November 12, 2021	5 weeks before the letting – MoDOT Bidding and Contracting Services furnishes alternate bid packages to bidders including ATCs in their bids.
November 12, 2021	Advertisement of Project
December 17, 2021	Letting date/bids due

The ATC process was followed with the ATC bidder as described in the above schedule. There was one Valid ATC proposed and reviewed by the ATC Review Team.

D. Bids Received

The bid results in December were reviewed and the ATC bidder was the apparent low bidder however the bid was over the Programmed Total Cost. Bids for the Project were ultimately rejected by the Commission. It was decided to Re-Let the project in April of 2022 without using the ATC Process. MoDOT received similar bids in total cost as the first letting. The previous ATC bidder combined with another Contractor to bid the project the 2nd time (both were separate bidders the in December of 2021). The newly formed Contracting Team bid more than their previous bids. The ATC bidder claimed they needed to form a Joint Venture for the second bid due to lack of available resources to take on the project and this likely resulted in their higher bid. American Bridge Company was awarded the contract for \$66,488,000 (well over the Programmed amount). No further action was taken from the ATC Process after award.

E. Lessons Learned

The impetus to use the ATC Process on a project like this may have been to avoid using Design-Build by the District. It would have been more favorable if more than one bidder participated in the ATC process. Innovation comes when many people can have valid ideas and since only a handful of contractors in the US could do this type of work (deep water foundations) ultimately led to a limited response. Perhaps this project was too large in scale or difficult, to foster the inspiration/innovation of smaller companies.

The delayed letting may have changed the availability of Contractors since it was observed that they combined with another company to form a joint venture for the second bid. This resulted in

a higher bid the second time. There was good participation at the ATC initial meeting by the industry. MoDOT received a lot of questions from engineering firms but not much from Contractors. MoDOT could have been clearer on what bridge design models should be used to evaluate the ATC's. A lot of time was spent discussing the merits of individual deflections of specific items verses the whole system approach and how the individual changes work together.

F. Conclusion

ATCs are not recommended for all projects and should be evaluated on a project-by-project basis through the Project Delivery Determination process. This project was a good fit for ATCs because it offered up a nearly complete set of design plans while leaving open the potential for contactors to identify substantial cost savings opportunities for a large, high-profit-potential project. This project could have been successful as a Design-Bid-Build, Design-Build or ATC. The bids may have been impacted by the pandemic, market fluctuations, competition and supply chain limitations.