



Alternative Technical Concepts

PROJECT CASE STUDY

For Michigan, Alternative Technical Concepts Result in Creative Solutions and Accelerated Construction on a Design-Bid-Build Project

Highway contractors have different strengths, operations, equipment, and strategies to efficiently stage and maintain traffic, and it is not uncommon for changes to occur after the award of a project that reflect a contractor's individual concepts. Using a contracting tool called Alternative Technical Concepts (ATCs) allows for early contractor involvement during project procurement that often leads to innovation, cost savings, reduction of environmental impacts, and an increase in overall value.

To maximize on the industry's innovations in this area, the Michigan Department of Transportation (MDOT) piloted its first ATC project, focusing on staging and maintaining traffic on a two-year, \$22 million freeway rehabilitation project on U.S. 10 in Midland County. This 6.9-mile project included the rehabilitation of eight bridges and the existing roadway. The project also included an alternate pavement bidding (APB) component, in which contractors could base their bid on rubblizing the existing pavement and placing an HMA overlay or constructing a concrete overlay.



The MDOT developed a base set of staging and maintaining traffic plans that could be bid on and used by any contractor. The ATC process permitted contractors to propose concepts that met requirements specified in the contract documents that would provide a cost-effective and efficient way to stage and maintain traffic. All ATCs submitted were kept confidential. If an ATC was approved, the contractor was responsible for procuring an MDOT pre-qualified consultant to complete the design at the contractor's expense. The MDOT reviewed and approved the ATCs during the project's six-week advertisement period, and contractors were able to base their bids on either the MDOT's plan or their approved ATCs.

BENEFITS AND COSTS OF USING ATC

Benefits

- ▶ Shortens construction time
- ▶ Enables early contractor involvement with innovation and constructability options
- ▶ Allows contractors to submit confidential proposals for competitive edge during procurement
- ▶ Advances new and more effective designs, technology, materials and construction methods
- ▶ Promotes best-value solutions because ATCs provide an equal or better product during procurement competition
- ▶ Allows owners to receive full value for savings versus a 50-percent share through Value Engineering Change Proposals (VECPs)

Cost

- ▶ Primary costs include those related to owner time, as well as costs for evaluating ATCs and performing necessary re-design for D-B-B. The key to assuring cost effectiveness is working together with consultant and contractor industry partners and establishing a good ATC process.



Keys to Success

- ▶ Staff that is dedicated to reviewing ATCs quickly to expedite the process.
- ▶ Release detailed draft plans and specifications to the bidders as soon as practical.
- ▶ Consider offering a longer advertising period, and use it to brainstorm possible ATCs with the evaluation panel to build consensus and consistency in the review process and expedite approvals.
- ▶ Be open to new ideas and creative solutions.
- ▶ Maintain confidentiality among contractors.
- ▶ Provide adequate time for contractors to develop and refine their ATCs.

Five contractors proposed a total of six ATCs during the advertising period, and four contractors submitted bids on the U.S. 10 project. All bidders used their approved ATC concept in their bids. On APB projects, the MDOT determines the selected contractor based on an Equivalent Uniform Annual Cost (EUAC) formula that calculates the lowest cost over the life of the asphalt or concrete pavement option bid. The formula includes the cost of the current project, user delay costs, future maintenance costs, and the expected life of the repair.

The two lowest bids varied by approximately 1.3 percent, and the MDOT selected the contractor that provided the lowest life-cycle cost based on the EUAC formula. The selected contractor's ATC allowed them to safely maintain traffic while accelerating construction activities. Because of this, the MDOT projected that all roadwork would be completed nearly a year ahead of the date specified in the original contract documents.

Before committing to the ATC process, the DOTs should remember that it requires dedicated staff in order to provide expedited reviews and responses to submitted ATCs. Additionally, maintaining confidentiality during the review process and providing adequate time for contractors to develop and refine their ATCs are also critical to the process.

ADDITIONAL RESOURCES

- ▶ Federal Highway Administration, "Alternative Contracting Methods: Alternative Technical Concepts," EDC Fact Sheet: http://www.fhwa.dot.gov/everydaycounts/edctwo/2012/pdfs/edc_atc.pdf
- ▶ Federal Highway Administration, Construction Program Guide: <http://www.fhwa.dot.gov/construction/cqit/atc.cfm>
- ▶ Federal Highway Administration, Alternative Contracting Methods Resource Library: <http://www.fhwa.dot.gov/construction/contracts/acm/>

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Every Day Counts (EDC), a State-based initiative of FHWA's Center for Accelerating Innovation, works with State, local and private sector partners to encourage the adoption of proven technologies and innovations aimed at shortening and enhancing project delivery



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