

ABC-UTC October 2022 Research Seminar: Alternative Technical Concepts for Contract Delivery Methods in Accelerated Bridge Construction

#	Questions	Responses
1	<p>What does an ATC (Alternative Technical Concept) submittal content generally include? Does it include only design modifications, or is there a requirement to submit any other documents?</p>	<p>Yes, design modifications are one of the important ATC submittal contents. Besides design modifications, an ATC submittal content also includes some form of narrative explanation of the proposed ATC. Additionally, it is required to submit drawings or sketches of the ATC and explain how it is related to the current project design. Most of the agencies also asked the contractor to provide an explanation about the impact of the proposed ATC on the project schedule, right-of-way, and permits. Moreover, some agencies also requested the contractors to submit cost data to show that the given ATC will accrue actual savings or to prove that the ATC fulfills the minimum cost savings constraint. Other agencies have indicated that they want cost data to be excluded to provide a purely technical appraisal of the ATC.</p>
2	<p>Project delivery methods like Design-Build (DB) are known to promote innovation and cost reduction in ABC projects. Why do you think it is important to integrate ATCs in such a project delivery method to achieve innovative and economic output?</p>	<p>There are differences between innovative ideas integrated through ATCs and without the use of ATCs in a project delivery method like Design-Build (DB). For instance, in the DB project delivery method, the design-builder can share their ideas with the owner or integrate them after they are selected. However, under such an approach the owner would only get the benefit of one design-builder's innovative idea, instead of assessing and comparing innovative ideas from multiple proposers before awarding the contract. Additionally, design-builders are motivated to propose confidential ATCs which add value to the project owner such that the ATCs can give them a competitive advantage over other proposers. The competition among the proposers would further help drive down the cost of the project and the integration of more innovative ideas. The integration of ATCs helps to achieve more innovative and economic output.</p>

3	<p>If any State DOT is planning to adopt ATCs for contract delivery of an ABC project, what are some of the important lessons or procedures that you have learned from case studies that could be useful for interested agencies?</p>	<p>One of the important lessons we learned from case studies is that procedures for submitting ATCs will vary between agencies and between project delivery methods. Most importantly, one of the essential procedures that any State DOT can implement is to develop DOT policy documents in such a way that it ensures competing contractors are not discouraged from pursuing ATCs in ABC projects. To achieve this, the DOT can specify the content of a responsive ATC submittal precisely so that the contractors can estimate the resource requirements and effort necessary to prepare a responsive ATC. Any errors, omissions, and ambiguities found in the solicitation document should also be addressed to ensure that issues found in the baseline design do not become the competitive edge for the party that first identifies them. Lastly, when an agency decides to implement ATCs on an ABC project, the agency will also need to verify the procurement schedule and allocate sufficient time for the development of ATCs by the industry and their subsequent review by the agency.</p>
4	<p>How many members does an ATC reviewer team generally have, and who are those members?</p>	<p>The number of members in an ATC reviewer team varies based on the scale of the ABC project and the number of ATCs. In general, members who are technically qualified to determine the viability of the proposed concepts and who can evaluate the impact of each ATC on environmental permits, right-of-way, and third parties are required. It is also advantageous to include a member who can assess the legal requirements to properly incorporate the ATC into the construction contract. Based on our findings, it is essential to include technical experts, the project management team, managers, FHWA professionals, and others as needed for unique concepts.</p>
5	<p>Are there any limitations to what can be submitted as an ATC? What are some of the lessons learned from the case studies related to ATC limitations that would be useful for contractors?</p>	<p>There are some limitations to what can be submitted as an ATC. First, the Department of Transportation may outline certain items or elements that will not be accepted as ATCs in the Request for Proposal or invitation for bid and are non-negotiable during procurement. Proposers also need to submit each concept as a separate ATC. Since a concept may include multiple interrelated parts, an ATC with multiple unrelated parts may not be beneficial for the ABC project as it could be rejected. For instance, in one of the case studies of the ABC project that integrated ATCs, a bridge slide and reduction in bridge length were allowed as ATCs with conditions. On the other hand, the use of spread footings instead of deep foundations, lightweight concrete, and integral abutments, among others, were rejected during one-on-one meetings. It is essential to look for limitations that the Department of Transportation may set for submitting an ATC.</p>

Questions during Seminar		
6	Did the Contractors participate in the huge savings the Owner enjoyed on the Hastings Project? If so, how were they awarded a percentage of the savings?	The majority of the savings made in the Hastings Bridge project was through the integration of eight ATCs to address challenges in the project such as complex foundation requirements, traffic control complexity, construction duration, impact on local business, and presence of temporary structures. The project had a total engineer's estimate of \$220 million but with the integration of ATCs, the cost of the project was reduced to \$120 million. The contractors might have made savings during the project. However, we are unable to comment on the percentage of savings made by the contractor since our research objective was to only understand the total savings made during the project and how it was achieved.
7	Did the three states that you used in your examples have a formal ATC process?	Yes, the three states that were part of our case studies had a formal ATC process. According to the interviewees, most of the ABC projects used the Design-Build (DB) project delivery method for procurement in these states. In the DB project delivery method, design-builders generally conduct solicitation of design and construction proposals only after a Request for Proposal is issued on partially completed designs. Then, design-builders may submit their proposals along with the implementation of ATCs. Lastly, the owner will implement a confidential process to review ATCs with design-builders, and based on selection criteria in the Request for Proposals, the owner will select the winning design-builder.
8	Did the states that you used in your examples pay for the ATCs?	Yes, the states bore the cost for the ATCs in the case studies. Primary costs include those related to owner time, as well as costs for evaluating ATCs and performing necessary re-design. One of the strategies to ensure cost effectiveness is working together with consultant and contractor industry partners and establishing a good ATC process.

9	How do you see ATC proposals working best within a Design-Bid-Build framework?	<p>Design-Bid-Build (DBB) is the linear approach of contracting which involves the solicitation of the construction contract by the owner for building the project post-design completion where the lowest bidder wins the contract. Due to such price competition, the final cost of the contract may potentially become significantly higher than the bid amount. While integrating ABC within traditional project delivery methods such as DBB, there is no collaboration between the designer/architect and general contractor during the design phase. This makes the process slower and increases challenges to the constructability of bridge structures in the construction phase. Therefore, DOTs can use ATCs to reduce costs, accelerate schedules, or design constructable projects. Additionally, ATCs promote early contractor involvement, and DBB-based ABC projects can exploit the benefit of early contractor involvement to improve design, cost estimation, planning, constructability, and risk management, among others.</p>
10	Do you see the need to include material specification acceptance with design proposals if the ATC introduces a material or procedure new to a State DOT?	<p>Yes, it is important to include material specification acceptance with design proposals if the ATC introduces a material or procedure new to a State DOT. For instance, a contractor is planning to integrate an ATC with novel materials such as a non-proprietary UHPC mix made with local materials to lower the costs as well as achieve the important mechanical properties and durability for its utilization in bridge components, connections, and repair. Such materials are new innovative ideas that are a part of ATCs and are new to a State DOT. In addition to material specification acceptance, it is important to provide a narrative explanation of why such materials are being used and explain how it is related to the current project design.</p>