

Atlanta, Georgia, Courtland Street Accelerated Bridge Construction Case Study

tech transfer summary

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RESEARCH PROJECT TITLE

Contracting of ABC Projects: Case Studies and Consensus Building

SPONSORS

Accelerated Bridge Construction
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The Accelerated Bridge Construction University Transportation Center (ABC-UTC) has assembled an experienced, knowledgeable, and engaged group of bridge academics and engineers who collectively provide the transportation industry with the tools needed to effectively and economically utilize the principles of ABC to enhance mobility and safety and produce safe, environmentally friendly, long-lasting bridges.

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the project sponsors.

The Courtland Street ABC project in downtown Atlanta, Georgia, included construction of the replacement bridge, followed by demolition of the old bridge in phases, based on design-build contracting and best value selection; this summary includes key take-aways from the project.

Project Description

The project was to reconstruct the 110-year-old Courtland Street Bridge from Martin Luther King, Jr. Drive to Gilmer Street in downtown Atlanta, Georgia. The project was in close vicinity to Georgia State University and the Georgia State capitol building.

The project delivery system for this bridge reconstruction in downtown Atlanta was design-build (D-B). This Courtland Street accelerated bridge construction (ABC) project followed the Georgia State Route (SR) 299 bridge replacement over I-24, which was a weekend closure that involved replacing two bridges. Many of the lessons learned from the SR 299 over I-24 project were directly applied to the Courtland Street Bridge project, helping to make this project such a success.

Previous Lessons Learned

The preceding SR 299 bridge over I-24 project was near the border of Tennessee and Georgia; as such, the project resulted in detour routes that were burdensome to the traveling public. The Georgia Department of Transportation (GDOT) constructed the new bridge north of the existing one.

Once construction of the replacement bridge was completed, the old bridge was demolished in phases. As this demolition occurred, traffic was moved onto the lanes that were not directly underneath the bridge work. Once the first bridge section was completed, traffic was moved to the other side of the road underneath the newly constructed bridge segment. After traffic was moved, the second section of the old bridge was demolished and replaced.

Although the project was ultimately successful and did not have any traffic accidents, the project had a closure time of 81 hours, instead of the planned 56 hours. The lessons learned from this project were documented, and, thus, available for the Courtland Street bridge replacement project. Lessons learned on the SR 299 project included the following:

- Providing the contractor with information that accurately conveys the condition of the existing bridge facilitate safer and faster demolition
- Coordination and communication between the design-build team and the DOT is critical to project success

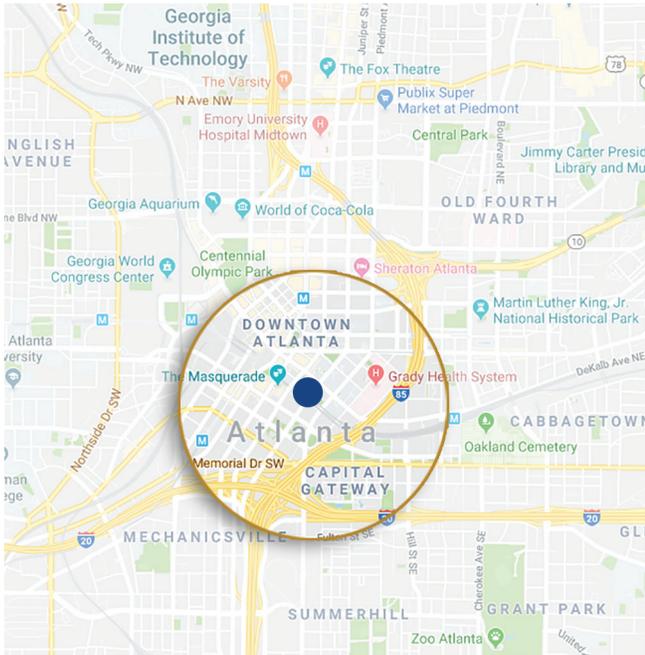
- Dedicated DOT staff should be on-site for the entirety of the project
- Consider the ABC timeframe based on the complexity of the project
- Overestimate the closure times prior to and during the ABC period for public outreach efforts to ensure realistic expectations for all parties
- Design can be improved when the engineer of record and the contractor work closely together

Why ABC

The project was originally programmed to be a conventional construction project. However, as planning progressed, it became clear in the constructability review phase that because the bridge was located in a highly complex urban environment, and the bridge was in the middle of a major university, it was not feasible to have a two-year closure. As such, the decision was made to switch the project to design-build delivery and to incorporate ABC methods.

ABC Procurement

The project was procured using the GDOT's Innovative Delivery office, using a best value procurement method. The best value was divided fifty-fifty between technical value and cost.



Map data ©2019 Google.

Location of the Courtland Street Bridge between MLK, Jr. Drive and Gilmer Street in downtown Atlanta, Georgia

Contracting

The contract was awarded based on a best value selection. The contract did not include any incentives for completing the bridge early, because it was already a part of the bid to get the bridge open early. Disincentives and penalties were in place in case the project went over the amount of time that was bid. The contract made it the responsibility of the design-builder to communicate with the shareholders.

ABC Construction

Construction on the bridge began with the substructure. The contractor removed and replaced the piers, and also placed the micropiles. The existing bridge was then closed, and the contractor began to deconstruct the superstructure, with deconstruction occurring along longitudinal halves of the bridge. Once half of the bridge was removed, the contractor replaced it using precast concrete beams, steel diaphragms, and high early strength concrete.

After the first half of the bridge was constructed, the other half of the bridge was demolished and replaced using the same techniques. The bridge was originally scheduled to be closed for two years; however, through ABC and D-B, the closure time was reduced to 180 days.

During the course of construction, the bridge office made a dedicated reviewer available for the project. The project was ultimately successful in part due to the increased collaboration that existed between the design-builder and the DOT.

The D-B team and DOT also rolled out an effective and far-reaching public information plan that included flyers, public outreach meetings, a website dedicated to the project, as well as hiring students from Georgia State University to assist in updating students on construction progress and critical closure times.



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Staged deconstruction of the existing bridge in downtown Atlanta

Key Take-Aways

- The bridge office made a dedicated reviewer available to answer questions for the project.
- Documenting and utilizing lessons learned on each project allows for continuous improvement and makes construction much smoother.

Acknowledgments

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