



Larpenteur Avenue – Minnesota Accelerated Bridge Construction Case Study

tech transfer summary

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RESEARCH PROJECT TITLE

Bidding of ABC Projects: Case Studies and Consensus Building

SPONSORS

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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 replacement of the Larpenteur Avenue bridge over I-35E north of downtown St. Paul, Minnesota was proposed by the contractor as an innovative ABC slide-in bridge project during the bidding process to help maintain traffic and reduce closure time during construction.

Project Description

The Larpenteur Avenue bridge over I-35E north of downtown St. Paul, Minnesota was replaced as part of the Minnesota Department of Transportation's (MnDOT's) I-35E MnPASS Express Lane project. The I-35E MnPASS project was designed to add capacity to I-35E, and to reconstruct nine bridges throughout the corridor, between Maryland Avenue on the south and Little Canada Road on the north.

While this particular project was not originally identified as an accelerated bridge construction (ABC) project, the contractor that was awarded the project elected to use a slide-in bridge to replace the Larpenteur Avenue bridge.

Why ABC

Unlike most ABC projects, the Larpenteur Avenue bridge was not identified as an ABC project by the DOT. Instead, it was proposed by the contractor during the bidding process.

The proposal of an ABC solution to the bridge replacement had the benefit of reduced closure time for Larpenteur Avenue, perhaps giving the contractor an advantage on a project with a heavy focus on maintenance of traffic. This serves as a great example of innovative solutions that can come from the flexibility allowed in the proposal process.



MnDOT

Construction of the Larpenteur Avenue bridge

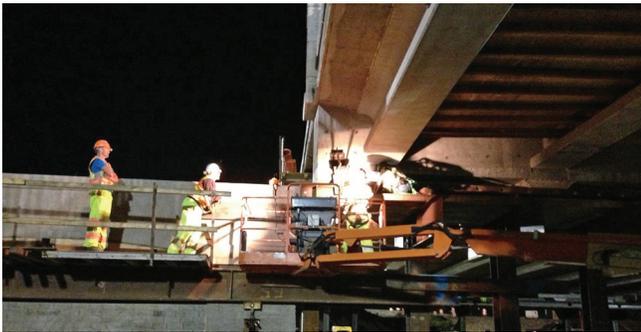
Design and Estimating

The project delivery system was design-build. This resulted in the design builder being responsible for the design and estimating for the project, including the design of the slide-in mechanism.

ABC Procurement

The project was procured using a best-value procurement for the selection. One of the criteria for the technical proposal was the closure time for Larpenteur Avenue. As previously mentioned, the ABC component that was proposed by the selected contractor provided reduced closure times, thus making their proposal more attractive.

The winning bid involved closing Larpenteur Avenue for 47 days, while the estimate for conventional construction was closer to 100 days. The slide-in technique required closing I-35E for two nights as the bridge was moved over the interstate.



MnDOT

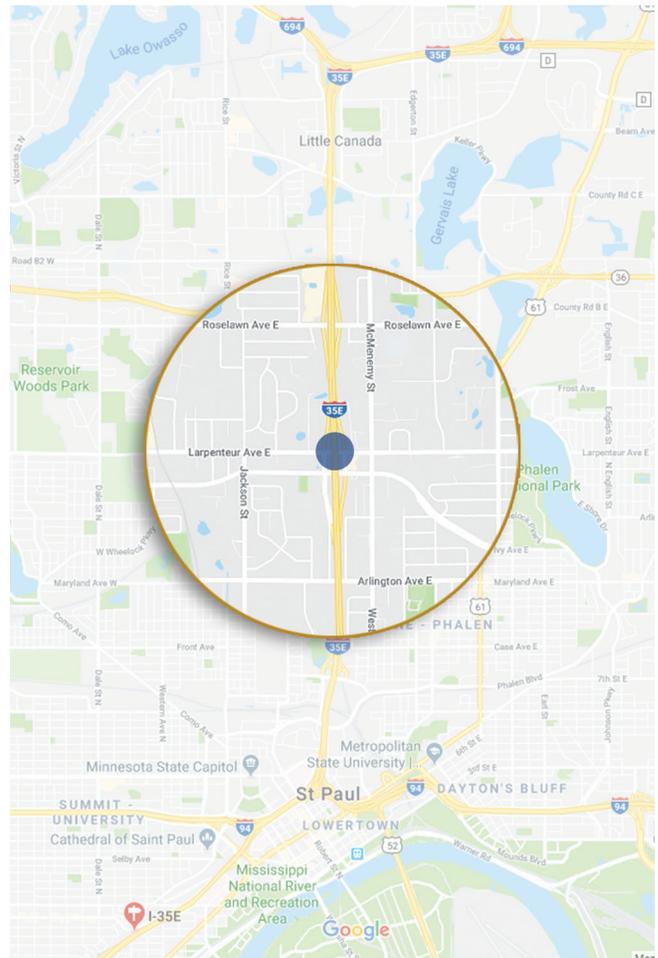
Nighttime work on the Larpenteur Avenue bridge over I-35E

Contracting

The contract did not have any incentives or disincentives. However, there were penalties for the contractor if more days were needed than the contracted amount.

In Minnesota, most projects are design-bid-build, although, on occasion, the state will utilize alternative contracting methods such as design-build or construction manager/general contractor (CM/GC) when deemed advantageous for the project.

Design-build was authorized by the Minnesota legislature in 2001 and was used for this project. Another alternative delivery method, CMGC, was authorized by the legislature in 2012 on a test basis. The legislation allowed MnDOT to have 10 CMGC projects total, while there can only be four CM/GC projects per calendar year.



Map data © 2019 Google, <https://www.google.com/maps/search/Larpenteur+Avenue+bridge+over+I-35E/@44.9784196,-93.1075428,14z>

Location of the Larpenteur Avenue bridge over I-35E, north of downtown St. Paul and I-94 in Minnesota

ABC Construction

The contractor utilized steel pile bents to hold the new permanent superstructure in the temporary position. Traffic was allowed to continue using the old Larpenteur Avenue bridge, while the contractor constructed the steel pile bents and the new superstructure.

Once the superstructure was completed, the old bridge was closed. Demolition began on the old superstructure and substructure. Once demolition was complete, the new substructure was constructed.

After the superstructure and substructure were completed, the superstructure was slid onto the new substructure. During the slide effort, there were issues with the bridge moving laterally. These complications resulted in the contractor needing to close I-35E an additional night to complete the slide.

Key Takeaways

- For construction, it is recommended to have multiple contingency plans.
- Contractors might propose ABC if it makes their proposal more attractive.

Acknowledgments

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