COLORADO
Department of Transportation
Region 2

Region 2 Bundle
CBC & CMP Program
Grant Project

DATE: October 10, 2019

TO: Karen Rowe, P.E. Region 2 Transportation Director
Stephen Harelson, P.E. Chief Engineer
Matthew Pacheco, P.E. Alternative Delivery Program Manager

FROM: Shane Ferguson, P.E. Region 2 North Program Engineer

SUBJECT: Design Decision, Alternate Project Delivery Method Recommendation
Project No. STM R200-262 (23398), Region 2 Bridge Bundle, CBC & CMP Program, Grant Project

BACKGROUND:
In December 2018, CDOT submitted three applications for grant funding under the U.S. Department of Transportation's Federal Highway Administration Competitive Highway Bridge Program(CHBP). The grant funds go toward highway bridge replacement or rehabilitation projects on public roads that demonstrate cost savings by bundling at least two highway bridge projects into a single contract. In August 2019, it was announced that 20 projects in 18 states were awarded grants totaling $225M. Of those 20 projects awarded, one was the CDOT Region 2 Bundle for $12.475M.

This project comprises the replacement of fourteen (14) rural bridges spread across highway corridors in southern and western Colorado. These bridges are located on key corridors for rural mobility as well as intra- and interstate commerce, particularly for the movement of agricultural and access to tourist destinations. All of the bridges are well past their design life and 13 of the bridges are at least 80 years old. The condition for 13 of the bridges is categorized as 'poor', leading to increased frequency and intensity of maintenance.

An abbreviated CDOT Project Delivery Selection Matrix (PDSM) was performed prior to submission of the application. Once Region 2 was notified of the grant award for the project, the Project Team performed a full PDSM facilitated by the CDOT Alternative Delivery Program Manager. The valuation team, which consisted of members from Region 2 Engineering, Environmental, and Traffic, as well as Staff Bridge, and Colorado Bridge Enterprise evaluated alternative delivery methods for this project. Design-Bid-Build (DBB), Design-Build (DB), and Construction Manager/General Contractor (CM/GC) methods were all considered.

ANALYSIS:

Project Complexity and Innovation

The number of bridges, their geographic location, and an accelerated schedule makes consultation between the owner, designer, and contractor highly beneficial. Though the structures are relatively simple, innovation can be realized through structure type and Accelerated Bridge Construction (ABC) methods that will help minimize disruptions to the traveling public. DB allows for contractor consultation/collaboration before, during, and after design, which is highly valuable for phasing and sequencing the delivery of the project.

Using DBB to deliver the project, phasing and sequencing would be established by CDOT. This could be challenging with limited input from the contracting community. DBB would limit the opportunity for innovation and efficiency that could be obtained through collaboration with contracting teams.

Using CM/GC would limit the opportunity for innovation and efficiency to one contracting team. Given that there are multiple structures with varying geographical location and condition, input from only one contractor is not desirable. Therefore, this is not the most appropriate delivery method.

Delivery Schedule

Statutory requirements of the CHBP Grant require that the project be obligated by September 2021, and be completed by September 2026. CDOT's grant application proposed obligation by December 2020, and completion by the end of December 2022. Though the proposed schedule may not be achievable, using DB to deliver the project not only allows CDOT to meet the statutory requirements but to accelerate delivery and the opportunity to complete the project ahead of those requirements.

Using DBB to deliver the project is the longest path to obligation and delivery. DBB requires the project to be completely designed and permitted prior to contractor procurement. It would be difficult to meet obligation statutory requirements if the project has to be fully permitted and designed before obligation (advertisement).

Using CM/GC would allow for quick obligation meeting statutory requirements. This method would require multiple contracts with negotiated Construction Agreed Price(s) (CAP) as design packages become ready for delivery. The risk of not being able to negotiate CAP and the potential for increased construction costs make this delivery method less desirable.

Level of Design

It is anticipated that 13 of the 14 bridges in the project will be replaced with concrete box culverts or reinforced concrete pipes, resulting in a relatively simple design of the project. All three, DBB, DB, and CM/GC would be appropriate for the design of this project. CM/GC appeared to be the most appropriate when evaluating level of design because of shared risk and the opportunity to leverage contractor input to optimize structure types and project sequencing and phasing early in the design process.

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Project Cost Consideration

Goals of the project include maximizing project scope and improvements with the project budget ($34.3M) and schedule, as well as minimizing project delivery time. This includes acceleration of the project to ensure obligation and completion dates are met sooner than the statutory requirements. Integrated design and constructability process with early team coordination should provide a cost-effective project. Design Build provides the opportunity to meet the goals and requirements of the project.

Risk Assessment

The risks associated with this project include:

- Meeting schedule (Statutory Requirements)
- Accelerated NEPA process
- Utilities impacted by construction and Utility Relocation Agreements
- Multiple bridge locations across the Region
- ROW impacts
- CDOT resources. Adding this project to the existing workload of CDOT staff

Using DBB, CDOT would own the risks for error and omission and also limit the opportunity for efficiency that could be obtained through collaboration with contracting teams. DBB is also the longest path to completion making it difficult to meet project statutory requirements. This makes DBB the least desirable method to mitigate risk for this project.

CM/GC allows the risk of errors and omissions to be shared with the design firm and contractor, making this delivery method appropriate for the project.

Using DB to deliver the project provides the opportunity to meet or beat statutory requirements. Innovation and the opportunity to deliver similar packages may help mitigate risk associated with multiple locations across the Region.

RECOMMENDATION:

Based upon the PDSM Workshop, findings of the Region 2 Project Team, and discussions with Bridge Enterprise and Staff Bridge, the Project Team recommends using the Design Build delivery method to deliver this project.

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Highlights of the Justification include:

- Ability to meet statutory requirements for obligation and completion
- Meets grant requirements of bundling multiple bridges under one contract
- Advantage of contractor input on:
    - Phasing and sequencing
    - Maximizing scope
    - Innovation for accelerated bridge construction
- Project can be accelerated
- Through strong CDOT management, risks can be quantified, optimized, and mitigated

The Project Team does not recommend DBB as there is possibility that the statutory requirements may not be met, in addition to the high risks associated with errors and omissions.

Based on multiple locations and the possibility of multiple packages with multiple CAP negotiations, the team does not recommend CM/GC.

It should be noted that following the PDSM workshop, the team met with Bridge Enterprise, Staff Bridge, and Alternative Delivery Program to discuss the different versions of Design Build. It was determined that Progressive Design Build and Modified Design Build were not appropriate to deliver the project.

I concur with the delivery recommendation:

Karen Rowe, P.E. Region 2 Transportation Director

Matthew Pacheco, P.E. Alternative Delivery Program Manager

Stephen Harelson, P.E. Chief Engineer

Cc: Jennifer Billings, Resident Engineer
Scott Dalton, Project Manager
Shane Ferguson, Region 2 North Program Engineer
Matthew Cirulli, Colorado Bridge Enterprise Program Manager
Patrick Holinda, Colorado Bridge Enterprise Deputy Program Manager
Matthew Greer, FHWA

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