



Design-Build, Progressive Design-Build and Construction Manager/General Contractor: Alternative Project Delivery Success in Utah

The Utah Department of Transportation (UDOT) has utilized the Design-Build (DB) method of project delivery since 1997, and has generally found the DB method to benefit complex highway projects through Design-Builder innovation. UDOT has also delivered several projects using the Construction Manager/General Contractor (CM/GC) delivery method, and in 2019, commenced construction on its first progressive DB highway improvement project. UDOT's extensive experience with DB and other alternative delivery methods offers a comprehensive perspective for the use of alternative delivery on DOT-delivered infrastructure projects.

UDOT's Experience with Benefits of Design-Build

DB is often considered to have benefits that include expediting project completion, allowing for Design-Builder innovation, and reducing claims and disputes. UDOT has varied perspectives on these:

- **Time savings:** UDOT has found that it has experienced time savings using DB over traditional design-bid-build (DBB) due to the overlap of the design and construction phases. However, UDOT cautioned that time savings may not be as significant as often theorized due to the lengthy procurement necessary in DB. DB procurements often involve two steps (RFQ and RFP) and the technical specifications for DB can take substantial time to prepare, particularly for complex projects. As a result, while UDOT has found that a benefit of DB includes time savings, it is rarely the most significant factor and likely would not alone justify using DB instead of DBB.
- **Innovation:** Overall, UDOT has found that one of the most significant benefits to DB is the potential for Design-Builder innovation. UDOT has found two types of innovation in DB: (1) major changes that impact a significant component of a project and (2) smaller innovations that in the aggregate amount to a significant improvement. UDOT has found that Design-Builders frequently improve projects with the latter, and this type of cumulative innovation is more common than major changes to the agency-issued technical requirements. UDOT notes that owners considering DB should not discount the smaller innovations that add up to a significant impact, even though the more significant, major innovations tend to receive more attention in studies of DB.
- **Change Orders:** UDOT has found that fewer changes orders and claims can result from the Design-Builder's responsibility for design and constructability on DB projects. However, UDOT has seen that this experience is project-specific and should not be considered guaranteed. UDOT has also found that there are still claims in DB characterized by Design-Builders as "owner-directed changes." In UDOT's experience, minimizing preferential comments on the Design-Builder's design and construction means and methods mitigates the potential for DB claims.

Environmental Experience

Both federally funded DB and DBB projects with a federal nexus are subject to NEPA requirements. Utah is a NEPA assignment state, meaning that FHWA has delegated Utah the authority to perform NEPA evaluations on its own.

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In UDOT's experience, the NEPA process can be more complex with DB projects; however, UDOT primarily attributes this to the fact that UDOT often uses DB on more complex projects that will inherently have a need for a robust environmental review. Given this experience, UDOT cannot definitively say that there is a difference in the NEPA process between DB and DBB projects.

UDOT's standard DB contracts generally allocate the responsibility for obtaining additional environmental evaluations necessary to implement Alternative Technical Concepts (ATCs) to the Design-Builder. Even with this allocation of responsibility and risk, it has not appeared to UDOT that proposers are holding back ATCs solely because those ATCs would require updates to the environmental documents. For example, large UDOT DB projects such as the Mountain View Corridor and West Davis Corridor underwent multiple environmental re-evaluations to accommodate ATCs.

Although UDOT allows Design-Builders to submit ATCs that may require environmental re-evaluation, UDOT does not always accept those ATCs. UDOT does not accept proposed concepts that have an unacceptable amount of risk or those that would not, after re-evaluation, fall within the original environmental clearances. UDOT carefully evaluates the risks and generally only allows concepts where the additional environmental clearance do not present a risk of delay or litigation. UDOT oversees the re-evaluation process and documents any updates as needed.

UDOT has not experienced litigation related to the NEPA process on a federal DB project. UDOT has experienced one challenge to a DB project during a state environmental review late in the process that resulted in the RFP not being advertised until after the lawsuit was resolved. The complaint was asking whether or not UDOT had the authority to conduct a state environmental study in lieu of NEPA. The suit was unsuccessful; as the project was state funded and had no federal nexus. UDOT carefully oversees environmental requirements to avoid violating NEPA and state requirements and to minimize the risk of litigation.

Design-Build Selection Factors

When deciding to use the DB delivery method instead of DBB, UDOT considers the primary factors to be:

- **Complexity:** A Design-Builder can provide the resources to tackle larger, more complex problems, and this is one of the primary reasons UDOT chooses DB for more complex projects;
- **Innovation:** UDOT views the prospect of innovation as a significant reason to use DB. Innovation often comes from ATCs from both the successful and unsuccessful proposers, as well as the selected Design-Builder's approach to design and construction. For projects with the potential for innovation, UDOT favors DB. However, for relatively straightforward projects without the opportunity for innovation, UDOT favors DBB.
- **Design Risk:** UDOT views the shifting of design and constructability risk to the Design-Builder as a benefit of DB.
- **Time Savings Compared with DBB:** As discussed above, potential time savings are a secondary factor, but, when combined with the other factors above, may compel DB over DBB.

UDOT's approach to alternative delivery has shifted in light of recent trends in the contractor market. UDOT has recently found that some contractors may be hesitant to pursue DB projects due to:

- The fact that Design-Builders are taking a more cautious approach to risk shifting in lump-sum contracts. Market appetite for risky projects has decreased, and contractors are becoming reluctant to propose on projects when owners shift too many unquantifiable or unpredictable risks to the Design-Builder.
- The amount of time and financial investment needed to prepare a Proposal. Proposers on DB projects can spend millions of dollars to participate in the procurement process. Design-Builders are becoming more hesitant to pursue projects where an owner intends to shortlist four or more teams due to the 25% (or less) likelihood of being selected. Together with the fact that owner stipends rarely cover the out-of-pocket costs of preparing a proposal, the costs and risks of pursuing complex DB projects are outweighing the potential reward.

Responding to these concerns, UDOT is reworking their approach to risk allocation and compensation to unsuccessful proposers. In addition, UDOT has recently started to use the Progressive Design-Build (PDB) delivery method. PDB uses a one-step qualifications-based selection instead of best-value (DB) or lowest-price (DBB) procurement. The shorter, less intensive procurement reduces the burden on proposers pursuing the project. Additionally, the progressive advancement of the design in PDB allows for a more refined understanding of risk, and potentially a lower risk premium in the price. UDOT has historically used the Construction Manager/General Contractor (CM/GC) delivery method and continues to view this model as another option.

Lessons Learned Implementing DB

When DB was first introduced at UDOT, there was a learning curve for UDOT staff to adjust to the administration of a DB contract. Many UDOT staff were more familiar with DBB, in which the agency has a more hands-on role in everything from design to construction inspection. In contrast, on a DB project, deference to the Design-Builder is required in many instances since the Design-Builder is the engineer of record, controls the design, and performs the construction work using means and methods of its choice. UDOT recommends other states should anticipate a learning curve when transitioning to DB and prepare staff for this shift in approach.

Other key lessons learned from UDOT's DB experience include:

- Maintaining a flexible approach to risk allocation and risk management to ensure that contractors are interested in pursuing DB projects;
- Understanding that shifting risks to the Design-Builder, particularly those that are difficult to quantify or mitigate, will result in a higher risk contingency built into the lump-sum price. Ultimately, this could result in the owner paying more than it needs to for risks that do not materialize;
- Considering the stipend paid to unsuccessful DB proposers as an investment rather than a cost. An owner receives the rights to use ATCs and proposal concepts in exchange for the stipend and viewing it in this manner may lead a DOT's project team to be more inclined to offer a reasonable stipend. This both encourages Design-Builders to pursue the project and to submit innovative ATCs; and
- Except where necessary, agencies pursuing DB should develop project specifications to be as performance-based as possible, rather than prescriptive. Prescriptive specifications stifle innovation by reducing the opportunity for ATCs and limiting a Design-Builder's flexibility in performing design and construction.

Project Example

The I-15 Technology Corridor project in Lehi, Utah demonstrated UDOT's successful use of DB to obtain innovative solutions and industry expertise to address a large, complex problem. The project, at a cost of \$415 million, encompassed a 4.5-mile section of urban freeway within I-15 that was reconstructed and widened from four lanes to six lanes in each direction.

The project was the final piece of a 30-mile section of I-15 to be rebuilt and widened in recent years and its importance was so critical that Utah accelerated funding by two years. The pavement and most bridges within the project area had reached the end of their useful life, with most having been constructed in 1965. Along the project corridor, 15 bridges that carry or cross over I-15 required replacement. Further, this project was aimed to ensure future compatibility at key interchanges within Utah County, one of the fastest growing areas in the country.

UDOT chose DB delivery method due to the goals, complexity, and size of the project, including:

- **Innovation:** UDOT has found that DB fosters innovation from design-build teams, offering technical solutions for this complex project that UDOT may not considered in-house;
- **Collaboration:** UDOT engaged local stakeholders early to work through the project needs and address stakeholder expectations for the project, including alternative mobility options such as bicycle

lanes. This feedback influenced the development of the technical evaluation criteria, and identified early project mobility opportunities and incentivized bidders to provide these more quickly during construction; and

- **Flexibility:** Ability to adjust scope, complete early action items, and expediting the project schedule compared to traditional DBB.

The project made use of several ATCs that saved costs and minimized traffic impacts. Examples of ATCs that benefitted the project include the following:

- The design-builder proposed to lower cross streets and relocate utilities close to I-15 in place of the initial concept, which was to raise the profile of I-15;
- The design-builder proposed the installation of walls that acted as both retaining and noise buffer walls. This accelerated the project schedule by not having to install two sets of walls, while still meeting environmental noise mitigation requirements; and
- The design-builder proposed to reconfigure a critical interchange at 2100 North along I-15 that allowed construction to move forward, keep traffic moving, and would better serve future demand in the Mountain View corridor.

Even with multiple ATCs, no environmental re-evaluations were required, and the project finished on-time with no major claims from the design-builder. UDOT considers this project to be a prime example of the successful use of DB delivery.

Conclusion

UDOT has experienced significant value from DB and, despite some words of caution, believes that it will continue to use DB for future highway projects. UDOT also looks to continue and expand its use of other alternative delivery methods, including PDB and CM/GC. UDOT will continue to use DBB on projects that are relatively straightforward, are generally less complex, and that do not present opportunities for innovation.

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Image courtesy of UDOT.