



# Bridges: Design–Bid–Build?

ANSWERED BY M. MYINT LWIN, RAY MCCABE, P.E., AND MALCOLM THOMAS KERLEY, P.E.

Some important questions have complex answers and benefit from reflection and discussion. In this series designed to reflect that understanding, NSBA asks leading minds in the bridge community to weigh in on some of life's imponderables.

**QUESTION:** What is the fate of design-bid-build?

**Answer:** M. Myint Lwin

Director of the Office of Bridge Technology, Federal Highway Administration

Design-Bid-Build (DBB) has been the project delivery method used by state and local transportation agencies for highway construction projects for more than 50 years. The owner's design team, which includes in-house designers and consultants, prepares the plans and specifications in meeting the owner's design requirements. The construction methods are fully prescribed and described in detail. The plans and specifications for the project are prepared in such a complete way that any contractor could follow them and complete the project with a high degree of success.

Competitive bidding, with award typically made to the lowest responsive and responsible bidder, ensures that the owner is getting the lowest cost for the project. The owner assigns a construction project team to provide quality and quantity control and inspection of the contractor's work. The owner and contractor work together to comply with the provisions of the contract documents, and in accordance with the negotiated cost and time, with regard to changes in design and constructability. This is a major disadvantage of the DBB method, because changes during construction generally result in significant increase in the final cost and time of the project. The causes for the changes might be traced back to the design process that did not involve the knowledge and experience of the contractors or construction personnel. Based on the costly lessons learned, an owner now integrates the expertise of construction, inspection and maintenance personnel into the design process to ensure constructability, inspectability, and maintainability of the project.

Because of the deliberative process of the DBB method, a major project using this method generally takes longer than with other methods, such as Design-Build (DB) and Construction Manager/General Contractor. However, many key advantages remain in the DBB method, especially for smaller and medium-sized projects. A few of these advantages are:

1. The design is completely defined before the project is advertised for bids. The bidders submit bids based on a complete set of plans and specifications, and other exploratory and preliminary information the owner may have in support of the design.
2. DBB is a low-risk method for both the owner and the contractor.
3. The owner is provided opportunities to develop and maintain the technical expertise of the in-house professionals. Additionally, the owner may prepare plans and specifications for projects in anticipation of needs, and put them "on the shelf" ready for bidding.
4. New contractors and smaller, less-experienced firms will have opportunities to gain experience and prepare themselves for other methods of bidding.
5. Through construction partnering and working together instead of against each other, the owner, designers, inspectors, fabricators and contractor are improving communications toward shared project success in overcoming the disadvantages of DBB.

Building on the many years of progressive improvement of DBB based on experience and lessons learned, I expect the DBB method will be in use for another 50 years or more, especially for small and medium-sized projects. For major and complex projects, owner agencies will be exploring many alternate methods for shortening project delivery, incorporating innovative materials and techniques, improving quality, and achieving best values for the projects.



**Answer: Ray McCabe, P.E.**

National Director of Bridges and Tunnels, HNTB Corporation

Perhaps the best way to answer this question is to review the current trend of Design-Build (DB), which for this discussion includes P3's—Public Private Partnerships, which generally use design-build delivery. DB is clearly becoming an increasing share of the civil and building market. Over the last few years almost all of the large transportation projects have been, or are going to be, design-build and this trend is expected to continue and branch into medium and even small projects, although to a much smaller degree. The following factors support the trend toward design-build:

- DB has proven its ability to deliver even the most complex projects efficiently (ahead of schedule and below budget).
- More and more states are passing legislation allowing DB. I believe there are approximately 45 states that have some form of DB legislation.
- Owner organizations are diminishing in size and depth due to budget pressures on government. DB allows owners to manage large programs with fewer people by shifting responsibility (and risk) to the private sector.
- Contractors are more comfortable today in competing in a process where qualifications and project approach matter in addition to price.
- Contractors and engineers are gaining experience working together effectively and are producing increasingly positive results within their individual organizations and for owners.
- The large European firms coming to the U.S. bring extensive DB experience. This is how projects get delivered in the rest of the world.

Does this all mean the eventual end of design-bid-build? Definitely not. Design-bid-build has been a very successful delivery method and will continue to be the choice for small projects and for unusually complex/high-risk projects where the owner has a strong interest in remaining in control of the design and construction.



**Answer: Malcolm Thomas Kerley, P.E.**

Chief Engineer, Virginia Department of Transportation

State DOTs have successfully used the Design-Bid-Build (DBB) procurement method for many years. With state DOTs downsizing, funding declining and transportation needs continuing to rise, they are looking for new ways to deliver projects faster and cheaper. As a result, the use of the Design Build (DB) procurement method as well as Public Private Partnerships (PPP) has increased. Most states need legislative action to allow these methods of procurement. Several states have passed legislation while others are still considering this change. For example, Virginia passed its Public Private Transportation Act to allow PPP in 1995 and DB legislation in the 2001.

What are the benefits of procuring projects using DB and PPP? These procurement methods provide states with fixed completion dates and costs based on the scope of the project, contract documents and risk transfer. Project risks are assigned to the party that can best manage them during project negotiations. PPP projects also allow for states to leverage their funds working with the private sector to bring non-traditional funding to finance projects.

So what is the fate of DBB? My crystal ball tells me that for the foreseeable future DBB will remain the main procurement method for state DOTs in terms of the number of projects. Many of the projects that state DOTs deal with are small improvement projects or rehabilitation projects to maintain their current systems. DBB projects allow state DOTs to maintain and train the staffs they need to manage their programs. Larger, more complex and financially challenging projects, where state DOTs are looking to reduce their risks and financial commitments, will use DB and PPP. Of course, there will be some large projects where DBB is used and some smaller projects using DB. The challenge for state DOTs is to ensure they deliver their projects effectively using the most appropriate procurement method allowed—DBB, BD or PPP.

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