



HOW CONTRACTORS CAN USE THE DESIGN/BUILD MODEL

for Transportation Success

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About the Author



For more than 26 years, M. Patrick Kane, PE, has worked with local, regional and state agencies in the design, construction, rehabilitation and inspection of bridges, tunnels and highways. In addition to local and county governments, his clients have included the Pennsylvania Turnpike Commission, the Pennsylvania Department of Transportation and other Departments of Transportation across the country. As Manager, Transportation Services at L.R. Kimball, Mr. Kane has managed several Design/Build projects. His experience also includes projects with complex roadway and bridge design, NBIS inspection of nearly 750 structures on the Pennsylvania Turnpike and preliminary design investigations of steel alternates for spans of Nevada's Hoover Dam Bridge.

The Future is Now

Why the Design/Build Approach is Gaining Traction

In the last few years, the transportation industry, including the Pennsylvania Department of Transportation (PennDOT), has begun to embrace the Design/Build process. This alternative delivery method for bridge, highway and tunnel improvements is becoming increasingly popular for two critical reasons - it saves clients time and it saves them money.

During the Design/Build process, an engineering firm and a contractor submit a collaborative bid to complete the project design and construct the project. Once the notice to proceed has been issued, the team is positioned to launch the project immediately. This contrasts with the more time-intensive traditional approach which requires a design consultant to prepare a complete set of design plans, followed by a bid advertisement for contractors and then, ultimately, the construction of the project.

Across the country, Departments of Transportation and other cash-strapped public and private sector entities are realizing the benefits of the Design/Build approach, including its proven ability to:

- Save time, through a more focused and streamlined project approach
- Save money, often resulting from:
 - The team's ability to adhere to contracted dates, and therefore, maintain the client's federal matching transportation dollars
 - Innovative solutions stemming from ongoing collaboration between the engineer and contractor team
- Meet accelerated deadlines for federal infrastructure improvement funding, deadlines that stem from temporary funding programs, such as the 2009 American Recovery and Investment Act (ARRA) or other short-term program extensions

Collaboration, communication and a strong working relationship between the engineering firm and the contractor are critical success factors in any winning Design/Build bid.

When Design/Build Works Best

The Design/Build process works best for projects that have one or more of the following characteristics:

- A tight, restrictive schedule
- Well-defined outcomes with little room for interpretation
- Few, if any, expected obstacles

HIGHLIGHTS

It's Not for Every Project

The Design/Build process works best when the team expects few, if any, obstacles. If the client anticipates that a significant amount of time will be needed to resolve a problem, a traditional approach to project design and construction should be taken. Common problems that can delay a project include:

- Utility coordination
- Right-of-way acquisition needs and/or disputes
- Permitting issues
- Cultural resources issues such as archeological considerations
- Protected, threatened or endangered species
- Lack of public consensus on the solution

In addition, complex, multi-phase projects, where one phase is dependent on work from the previous phase, are not ideal Design/Build candidates. Common examples include projects with multiple alignment studies or bridge rehabilitation projects where the bridge load capacity for various configurations has not been verified.

Projects that meet these criteria give the contractor the freedom to use innovative, cost-effective methods to meet the desired outcomes. This ensures that the finished product will meet state or federal standards, including those published by the American Association of State Transportation Officials, without exceeding the project budget.

Projects that are well-suited for Design/Build can include:

- Bridge replacements
- Bridge redecking and rehabilitation where loads are determined
- Highway improvements, such as ramp reconstruction, concrete patching or bituminous overlay
- Wall designs
- Maintenance and protection of traffic solutions

Although the Design/Build process has been proven to trim costs and save clients valuable time on a variety of transportation initiatives, it may not be suited for every project. If a client anticipates that the project may encounter significant delays, perhaps resulting from utility constraints, right-of-way issues or a lack of community consensus, a more traditional approach should be considered.

Choosing an Effective Design Partner

Although most Design/Build projects are developed and completed on a shortened timeline, they must still meet and maintain all state and federal requirements. With no room for error, contractors should evaluate potential engineering design partners based on criteria that includes:

- Successful experience with dozens of varied Design/Build projects
- Experience and familiarity with the client's staff
- Expertise with local, state and federal regulations
- Integrated, full-service capabilities that are readily accessible to execute nearly any aspect of the project, including:
 - Highway design
 - Structures design
 - Geotechnical engineering
 - Environmental engineering and analysis
 - Hazardous waste removal and remediation
 - Permitting
 - Traffic design and control

HIGHLIGHTS

Design/Build Leadership

L.R. Kimball has been a Design/Build leader in transportation since 2002. Its team has designed several highway projects and replaced nearly 20 bridges across Pennsylvania using this alternative delivery method. Recent achievements include:

- Trumbull Corporation partnership to make several improvements across I-79 in southwestern Pennsylvania, including methods to maintain the flow of more than 60,000 vehicles a day
- Trumbull Corporation partnership to replace three bridges along I-81 near Carlisle, Pennsylvania, including permitting, traffic planning, water quality solutions, habitat assessments related to endangered bog turtles and safety precautions for nearby hikers, boaters and fishermen
- Susquehanna Valley Construction partnership to redeck and rehabilitate two bridges, including an in-depth inspection of a 2,800-foot-long bridge that required several weeks of intensive field data collection

Demonstrating its innovative leadership in the Design/Build marketplace, L.R. Kimball was also one of the first engineering firms to accommodate Pennsylvania's new requirement for a project peer review.

- Water and waste water solutions
- Property and topographic surveys
- Cost-competitive reputation
- Shared vision on project objectives, expectations and final results
- Complementary cultures that support open communication and foster collaboration to meet project goals
- Experience with Pennsylvania's new Peer Review Process, which requires the contractor to hire a consultant to perform an independent peer review to further protect the client against errors
- Reputation with Design/Build and value engineering projects

It is important to note that engineering design partners must be willing to invest a considerable amount of upfront design work to assist the contractor with the preparation of its cost-effective bid. With this in mind, contractors should also evaluate potential Design/Build partners based on their willingness, desire and availability of resources to make this kind of commitment.

For more information, please contact:

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