



Tips for Incorporating Work Zone Safety and Mobility in Request for Proposals (RFP) for Design-Build Projects



U.S. Department of Transportation
Federal Highway Administration

Publication No. FHWA-HOP-13-025

March 2013

In recent years, design-build (DB) projects have become more prevalent as agencies seek to speed up projects and leverage resources through the growing use of public-private partnerships, accelerated project timelines, and contracting out design work. While the good work zone planning, design, and operations practices advocated by the Work Zone Safety and Mobility Rule¹ still apply to DB projects, they may need to be applied somewhat differently to address the differences between DB and traditional design-bid-build (DBB) processes. Key challenges with regard to implementing the Rule on a DB project include:

- The Agency (owner of the project) and the Contractor assume different roles and responsibilities in a DB project.
- Plans, specifications, & estimates (PS&E) are not developed for a DB project prior to bid. A DB project relies on a good Request for Proposals (RFP) that specifies requirements, specifications, and expectations to ensure the Contractor understands them and is able to deliver the design and implement the project.
- Development of a transportation management plan (TMP) is the responsibility of the Contractor who may not have the appropriate expertise. Therefore, the Contractor usually has to hire the expertise from a consultant who may or may not be familiar with the Agency's policies.
- Implementing a TMP for a DB project is a challenge as the phasing for a DB project is not set-up during the RFP stage. Traffic control plans may only be developed days before they will be implemented and require prompt review. The accelerated timeframe allows limited time for resolution of issues during plan development/review.
- Maintenance of traffic (MOT) issues can be particularly challenging in a DB project where traffic configurations may change on a frequent basis due to the accelerated project timeline. When issues arise, the accelerated timeframe may allow limited time for resolution before the work zone configuration changes.

States experienced with DB projects have noted that for good work zone traffic management it is critical to develop a good project scope and requirements that include everything the Agency expects since they will guide the proposals and direct the selected Contractor team's efforts. The following tips can assist Agencies with developing effective RFPs for DB projects. The target audience is Agency management and individuals who are responsible for the planning and development of DB projects, bid packages, TMPs, and management of work zone safety and mobility.

¹ Information on the Work Zone Safety and Mobility Rule (23 CFR 630 Subpart J) can be found at http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm.

TIP: Understand the Differences between Design-Build Method and Traditional Project Delivery Methods

Understanding the differences between DB and DBB is important when writing an RFP because these differences affect what is included in the RFP, how requirements are stated and their specificity, how responsibility is divided between the Owner-Agency and Contractor, and how the proposal is scored.

Design-bid-build: DBB is the traditional method for delivering transportation projects. The Agency (or a consultant for the Agency) prepares the design and PS&E package. The PS&Es specifically identify what the Contractor is supposed to build, where they should build it, what they should build it with, and what phasing, staging, and traffic control are to be used while constructing the project. Contractors engage in a competitive low-bid process to follow the specifics of the Agency supplied plans and specifications. The lowest responsive, and in many cases prequalified, bidder is awarded the project once the Agency has determined that sufficient funding exists. Under the DBB delivery process, the Agency assumes the risk, guaranteeing to the Contractor that the PS&Es are error-free.

Design-build: With DB contracting, prospective proposers receive an RFP which includes the preliminary design (technical requirements for designing and constructing the project), the scoring process, and selection criteria. The Agency identifies the project requirements and specifications in the RFP, and the Contractor has the ability to choose the methods to create the construction plans and build the project. This allows the Contractor much greater flexibility to use its own innovations and efficiencies in building the job. The winning team performs both the engineering and construction services under one contract. Generally the bid process is based on a best value (price, schedule, and proposal score), but some agencies use a version of low-bid DB. In contrast to DBB, DB relies on a single point of responsibility contract and is used to minimize risks for the Agency and to reduce the delivery schedule by overlapping the design phase and construction phase of a project. One of the benefits of a DB project is that it allows the design-builder to be innovative in their method of designing and constructing a facility because the project is not fixed to an already-developed PS&E package. Because the design-builder has a significant amount of flexibility, the Agency faces a different type of risk. There is reduced control over what the final product will look like and how it will be built because what is not specified in the RFP has variability. The RFP should identify the manuals and standards to which the Contractor will be held, and their relative priority in the case of conflicts.

TIP: Emphasize Safety and Mobility as Evaluation Criteria

It is critical to clearly identify and emphasize the project goals and Agency's expectations in the RFP, including for managing safety and mobility impacts. The proposal evaluation method and scoring criteria must be clearly stated in the RFP. The appropriate level of scoring needs to be attached to safety and mobility in the proposal evaluation criteria. It is critical to have safety and mobility as part of the value-based criteria to communicate to bidders that these factors are important to the Agency and will be considered in proposal scoring. The qualifications and experience of the design team's Traffic Control Manager should factor into scoring. The Agency must make sure that the RFP specifies clearly on safety and mobility elements but at the same time leaves enough room to encourage the proposer to develop a solid proposal with value added elements and innovative ideas. Because the Contractor bears much of the responsibility in work zone traffic management in a DB project, safety and traffic management related elements may need to be assigned more evaluation points to ensure safety and mobility are given appropriate consideration during proposal evaluation and contractor selection.

TIP: Involve Agency Work Zone Safety and Mobility Personnel in RFP Development and Proposal Evaluation

To ensure work zone safety and mobility receive the necessary attention during scoping, RFP development, and proposal evaluation, it is important to include Agency personnel who are responsible for work zone safety and mobility. These personnel have expertise in safety and mobility and can help develop an RFP that reduces safety and mobility issues during design and construction. Some DOTs have noted that the MOT section of the scope is usually extensive (e.g., 20 pages) for a sizable design-build project. It is valuable to have work zone safety and mobility staff on the evaluation and selection committee to ensure that safety and mobility factors are adequately understood and considered in the proposal evaluation process.

TIP: Involve Appropriate Stakeholders in RFP Development

Planning for work zone safety and mobility is a collective effort by all parties involved in the project. These include not only the Agency and the Contractor, but also other State, regional, and local stakeholders, including law enforcement and incident/emergency management stakeholders. For a DB project, early engagement and participation from key stakeholders helps build goals and expectations into the RFP that ensures the Contractor can develop plans that meets the Agency's needs and the project requirements. For example, involving incident management stakeholders early in the incident management planning during the project scoping and RFP development process can enhance work zone safety and mobility and ensure adequate access for emergency services during construction. While early engagement of incident management stakeholders in the RFP development, design, and TMP development stages for DBB projects is essential, it is even more critical for DB projects as the development of TMPs and associated plans for incident management are handed off to the Contractor prior to completion of the final design plans.

TIP: Include Requirements for Proper Coordination with Affected Agencies

It is essential for all parties (the Agency, the Contractor, and other affected agencies/stakeholders) to realize that there is a shift in the roles and responsibilities with DB versus DBB projects. Due to the nature of the DB process, all parties involved in the project (including the Agency and all members on the Contractor's team) have to work collaboratively to ensure project success. However, the Agency should not assume such coordination will occur automatically. Requirements for proper coordination between the Contractor and all affected agencies should be included in the RFP to ensure that the Contractor works closely with the Agency and all other affected agencies (e.g. law enforcement) throughout the project to successfully develop and implement the design, the TMP, quality management, public outreach, etc. The RFP should also specify the requirements and process for resolution of disagreements. This close working relationship helps building a strong sense of project ownership for all parties involved in a DB project.

The Agency can include a requirement in the RFP that a committee or a task force be established to assure that the Contractor properly coordinates with affected agencies and to make sure the TMP is in conformance with the requirements of the RFP. The RFP should also include language to ensure the Contractor involves all affected agencies in the creation of the TMP and associated plans. Close coordination and communication with the committee or task force will build trust between the Contractor and the committee members, and lay the groundwork for a positive working relationship.

TIP: Specify TMP Requirements

The RFP should specify the components that must be included in the TMP and responsibilities for TMP implementation. It should also specify how changes to the TMP will be addressed and what the

processes are for review and approval of the TMP and the various traffic control plans (TCPs) that are part of the TMP.

TMP Content: FHWA's *Developing and Implementing Transportation Management Plans for Work Zones*² recommends components that agencies consider for their TMPs. These components are generally just as applicable to DB projects as to DBB projects, but the TMP for a DB project is likely to be even more of a "living document" because updates to the TMP will frequently be needed as project design progresses. Components mentioned in the FHWA guide include: Introductory Material (e.g., overview of the TMP, a Licensed Engineer stamp page if required by the Agency); TMP Roles and Responsibilities (e.g., who is responsible for managing the TMP, implementing various components, approvals, TMP monitoring and updates, emergency contacts); Project Description; Existing and Future Conditions for the roadway, traffic, and project area; Work Zone Impacts Assessment; Selected Work Zone Impacts Management Strategies; TMP Monitoring Requirements; and Contingency Plans (e.g., identifying potential problems, corrective actions to be taken, standby equipment or personnel). TMP Implementation Costs may not be estimated or tracked in the same way for DB projects since the Contractor will have already bid a cost for the TMP.

In addition, the Agency should consider specifying requirements in the RFP for items like the following:

- Design vehicle used for project geometrics,
- Minimum lane and shoulder widths,
- Design speed minimums,
- Construction access/egress,
- ADA pedestrian access,
- Positive protection for work zones,
- Traffic phasing to accommodate construction staging, including conceptual MOT plans,
- Temporary roadways,
- Temporary illumination,
- Public information plans,
- Use of ITS (existing ITS and keeping it during construction, temporary ITS),
- Safety service patrols,
- Inspection and maintenance of traffic control, including response times to correct, modify, or implement changes,
- Coordinating with adjacent projects (if applicable),
- Identification and incorporation of the needs of transit and freight operators, utility owners, schools, emergency service providers, and business owners in the project area (e.g., access to bus routes, truck routes, hazardous material routes),
- Procedures for road and lane closures.

TMP Review and Approval: The RFP should specify who will review and approve the TMP and the various TCPs for the project, and what the timelines are for these reviews. New or revised TCPs can be developed at an accelerated rate during a DB project. Delays in reviewing TCPs can quickly delay the project and result in compounding issues. The Agency needs to think through and clearly define who has responsibility for TCP reviews (whether done by the Agency itself or a consultant/contractor), how

² Developing and Implementing Transportation Management Plans for Work Zones, U.S. Department of Transportation, Federal Highway Administration, Washington, DC, December 2005.

approvals will be done, and whether the Contractor can proceed when reviews are delayed. While some parts of the TMP may change regularly for a DB project, other components such as the use of a safety service patrol or ITS may be established once and carry through the entire project, or only be updated periodically. The Agency may want to specify different review procedures for the full TMP or components that change less frequently.

TMP Implementation: The RFP should specify the division of responsibilities and timelines for TMP implementation. While the Contractor bears primary responsibility for TMP implementation in a DB project, the Agency may choose to have higher involvement in certain aspects such as public outreach. Due to the fast moving nature of DB projects, issues with implementing TMPs and/or TCPs may not always be addressed before the work associated with the issues has been completed and the work zone has been removed or altered to a new stage. The Agency can address this concern by including provisions in the RFP stating that work zone traffic control issues must be addressed within a specific time frame or monetary damages will be assessed.

TMP Changes: The RFP should specify when the TMP needs to be updated and who is responsible for making the updates to avoid confusion during the project. Identifying the requirements for TMP updates/changes can help avoid the possibility that the TMP becomes out of date as the project progresses and circumstances change.

TIP: Specify Requirements for Assessing Work Zone Safety and Mobility Impacts

The RFP should address what types of impacts assessment the Contractor is required to perform to assess the likely impacts to traffic and facilities from the construction. Having an understanding of the likely impacts to traffic and facilities is important for developing an effective TMP that manages those impacts and keeps them to acceptable levels, while still allowing for construction operations. In DB projects, the project design progresses in parallel to construction, so there is often limited time to develop and update the TMP. This needs to be taken into account when establishing the requirements for assessing work zone impacts. Such requirements should address elements such as:

- When the Contractor needs to perform an assessment (e.g., for major phase changes, while developing a new set of TCPs),
- Type of assessment required (qualitative, quantitative, or both),
- Whether higher-level, accelerated assessments can be done in certain situations,
- Analysis tools/computer models required for the analysis,
- Types of outputs required – both format and measures (e.g., delay, maximum queue length expected),
- What to do if the analysis shows that desired performance goals will be exceeded, and
- When updates to analysis are required (e.g., when significant changes to the TMP are made).

TIP: Use Performance-Based Specifications

DBB projects give a large degree of control of the design to the Agency and use prescriptive design and specifications. DB projects require the Agency to relinquish much of that control to the DB Contractor and more often use performance-based specifications in the RFPs. The use of performance-based specifications often enables the Contractor to use innovation and take risks which may lead to trade-offs between safety and mobility and schedule delivery and cost. To ensure that any such tradeoffs will be acceptable to the Agency, the RFP needs to specify some bounds. For example, the RFP can specify intermediate contract times (ICT) which identify when certain key elements of the project must be done (e.g., a ramp constructed and opened to traffic), or time restrictions for when specific lanes and ramps

can be narrowed or closed during given time periods (e.g., weekdays, weekends, special events). Liquidated damages can be attached to these conditions to address non-compliance.

Agencies are familiar with using performance-based specifications for tangible elements of the project such as lane smoothness for the asphalt and concrete pavement. However, using performance-based specifications to address work zone safety and mobility can present challenges to agencies. For example, unlike material quality and quantity, elements such as safety and traffic control can be challenging to specifically measure, test, and verify. It is not uncommon that in the RFP, the TMP and its components are identified as a Traffic Management line item in the pay items list. To use performance-based specifications in a DB project, the Agency can impose liquidated damages along with TMP-related performance specifications to ensure the Contractor meets the project requirements.

For example, due to the fast moving nature of DB projects, issues with implementing the TMP and/or traffic control may not be addressed before the work associated with the issues has been completed and the work zone has been removed or altered to a new stage. This situation can be prevented by including provisions in the RFP stating that work zone traffic control issues must be addressed within a specific time frame or monetary damages will be assessed.

TIP: Identify Data Sources to Assess Performance-Based Specifications

Performance-based specifications are difficult to use if appropriate data cannot be collected or is not documented. It is important to identify data needs for performance-based specifications early in project development and define and include data collection responsibilities in the RFP. Explicitly defining data needs and data collection responsibilities in the RFP is critical to ensure data required for performance-based specifications are captured. Parties other than the Agency and the Contractor may be potential data collectors and sources. For instance, law enforcement agencies and towing companies may have crash data for after hours that are not collected by the Agency or the Contractor. It is important to identify potential data sources in the RFP along with data collection responsibilities. It is also important for the Agency and the Contractor to collaborate closely with the data sources throughout the project.

TIP: Collect and/or Analyze Operational and Safety Data

Work zone operational data are valuable for safety and mobility analyses to assist with improving traffic control and management techniques not only for the project itself but also future projects. It is beneficial to include provisions in the RFP for the Contractor to collect and/or analyze operational and safety data to monitor and manage work zone impacts. For example, a travel time data collection program can be included as a requirement to facilitate monitoring and management of work zone mobility performance. The Agency could include a documentation requirement for crashes so that it is easy to identify if changes need to be made at high accident locations, ensure follow-up to address corrective items, and facilitate documentation gathering in the event of any legal actions.

When high percentages of the evaluation score are devoted to work zone safety and mobility in the RFP, it is not uncommon for the Contractor to include work zone monitoring/data collection capabilities (e.g. additional CCTV and portable vehicle detection) as value-added elements. However, due to resource limitations, the collected operational data may not be used to identify potential causes and remedies for work zone safety and mobility impacts or for other safety or operational related analyses. The Agency may include provisions in the RFP for the Contractor to collect as well as analyze the data if resources are available or for the Contractor to collect and submit the data to the Agency for analysis. Detailed requirements for data collection and/or analysis should be specified in the RFP.

TIP: Specify Non-Negotiables Without Being Overly Prescriptive

Although the primary risk (responsibility, schedule, quality of facility) for a DB project is with the Contractor, the Agency assumes a different type of risk – reduced control from what exists in a traditional DBB project. A key part to managing the Agency’s risk in a DB project is to write a solid RFP. As valuable as innovation is for a DB project, the Agency must be clear and firm with their non-negotiables in the RFP to avoid bearing unnecessary risks. The Agency needs to analyze and understand the risks it assumes with a DB project and include requirements in the RFP to minimize the Agency’s risks and liability. The RFP should also specify how requirements will be verified and/or enforced and how the Contractor will be held liable for non-compliance.

A DB RFP may sometimes use condensed specifications and therefore miss including some of the necessary requirements for a given project. To reduce unnecessary risks, the Agency should carefully review and verify that all requirements and specifications are properly covered in the RFP, directly or by reference. There are cases where the Owner’s guidelines and/or procedural requirements are conflicting or vague. When this is the case, it is important that the RFP includes project specific guidance that supersedes policy material to ensure that clearly defined and unambiguous guidelines and requirements are specified.

In writing the RFP, it can be helpful to give more emphasis and attention to process than to pay items, and to requirements that must be met than to items that are optional to keep from being so prescriptive that it precludes innovation. While the Agency should avoid including very prescriptive requirements in the RFP that specify “how” to do something in order to enable innovation, the RFP needs to be specific enough to ensure that the Agency gets what it needs. The Agency must have solid (special or overall) standards that allow for a quantitative look into important aspects rather than leaving requirements at a qualitative level. For example, qualitative requirements such as “adequate retro-reflectivity” would be better stated as “the signs used must meet MUTCD minimum retro-reflectivity standards.” A less prescriptive RFP may require the Agency to perform more careful reviews later in the project.

TIP: Encourage Innovation

One of the major benefits of the DB delivery method is that it allows the Contractor flexibility to generate and implement innovative ideas to shorten the project schedule, increase safety and mobility, and reduce project costs. It is important for the Agency to recognize the value of innovation in improving work zone safety and mobility. To encourage innovation, the Agency should avoid including very prescriptive requirements in the RFP to allow the Contractor the opportunity to be innovative. The DB delivery method can be an effective way for the Contractor to deliver innovations that the Agency may not consider due to institutional or political concerns. The RFP should include requirements that the Contractor provide justification for innovations vs. impacts to motorists to ensure that any modifications do not adversely affect the traveling public.

For agencies that are unfamiliar with the DB delivery method, it may be more comfortable to use somewhat prescriptive RFPs for DB projects in the beginning. Prescriptive RFPs allow the Agency to have more control over the project. Once the Agency becomes more comfortable with the process as more DB projects have been completed, the Agency can transition to less prescriptive RFPs that allow for more innovations, use performance-based specifications, allow flexibility in alternative technical concepts (ATCs), and focus more on the final products than the process.