
Puget Sound Gateway Project

SR 509, I-5 and SR 167 Funding and Phasing Study: Strategic Corridor Design Review



Appendix N: Design-Build Delivery White Papers

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DESIGN-BUILD-FINANCE

Overview

In a Design-Build Finance (DBF) transaction, the public owner transfers the design, construction and financing responsibilities to the private sector. The public owner retains the responsibility to manage the operations and maintenance of the facility along with all toll revenue and demand risk. The financing component of DBF transactions can be structured in a variety of ways depending on the goals and needs of the project. The size, term and payback schedule of the financing are the defining elements of a DBF transaction. The repayment scheme can begin at project completion, or tied to milestones during construction or continue well beyond construction is complete. The financing component can be required to cover all development costs or to provide a “gap” financing to fully fund a project after all other funding sources are contributed. Unlike Design-Build Finance/Operate/Maintain (DBFOM) transactions that typically have agreement terms of over 20 years, DBF transactions typically range from 3-20 years. With DBF agreements, all toll rate setting ability remains with the public owner. DBF procurements can be based on the best-value approach and the proposer bids are expected to include all financing costs.

Since DBF transactions require a private financing, the responsibility to arrange the financing lies with the private sector. DBF transactions are essentially an “off-balance sheet” form of debt and can be useful for owners who have short-term cash flow constraints, have a funding gap, wish to forego the debt issuance process or are not authorized to issue debt. DBF transactions require a contractual commitment from the public owner to repay all financial obligations established in the DBF agreement. The public owner’s source of repayment can be structured from a variety of resources, but generally requires a broad pledge of general transportation revenues. These payments can be prioritized through legislative appropriations or agency policies to strengthen the credit pledge and achieve a lower borrowing cost. The mechanism for the financing component is up to the discretion of each bidder (assuming compliance with the DBF agreement), but likely sources include bank loans, capital market bonds or a self-financing.

Although DBF transactions can be structured in a variety of ways, they typically fall into three categories. However, even inside of these categories, there can be significant variances due to milestone payment schedules, final term or warranty periods. The three typical types of DBF Transactions:

- Construction Loan – The DBF can be structured as a short-term financing of the total project costs with complete repayment tied to final project acceptance. In this scenario, the public owner does not have to provide any of the upfront project funding and only repays the developer once the project is operational. The developer is incentivized to deliver the project as soon as possible to trigger the financial repayment.
- Gap Financing – The DBF financing component can be structured to provide the missing funding component to make up for available public contributions that fall short of the total amount needed to fund project completion. In this instance, the financing component will be structured to supplement the public funds and fully fund the project’s development and financing costs

based on the bid price. This is the most common form of a DBF and allows an owner to advance a project and manage short-term funding constraints in a STIP.

- **Long-Term Financing** – While full repayment of the DBF financing is typically within a few years of construction completion, a DBF can be structured with a longer repayment term if the public owner wishes to make smaller payments over a longer period of time. This type of DBF would resemble an Availability Payment style transaction that is sometimes included with DBFOM delivery, but without the operations and maintenance components. This type of a transaction should feature a strong credit pledge and not have repayment tied to asset performance since the developer’s obligations end after construction.

Advantages of DBF

- The public owner retains control of O&M and toll rate setting
- Public owner retains all toll revenues
- Provides fixed price, date certain delivery
- Provides a mechanism for the project to advance even if full public funding is not initially available

Disadvantages of DBF

- The private financing, albeit short-term, may be considered a form of P3 delivery and attract industry or political resistance
- Requires a contractual agreement to fulfill all funding obligations over the life of the transaction
- Cost of capital could be higher than a pure public financing
- Financing component adds a new element to established procurement processes

Example Projects

DBF has been utilized on over a dozen projects in several states. Florida DOT (FDOT) is by far the most frequent public owner using this method. DBF delivery has also been used in Florida, North Carolina, Texas, New Jersey, Michigan and other locations. A sample listing of DBF projects includes:

Examples of Design-Build-Finance (DBF) Utilization in the DOT Market Sector

FDOT	US 1	\$113 million	FDOT	I-75 Widening	\$458 million
FDOT	I-95 Express Lanes	\$139 million	FDOT	I-4 Connector	\$400 million
NCDOT	I-485 Loop	\$540 million*	MDOT	I-75/M-21	\$7.3 million
FDOT	Palmetto Sect 2	\$192 million	MDOT	I-69	\$38.3 million
NJDOT	Atlantic City Tunnel	\$232 million	FDOT	Palmetto Sect 5	\$560 million
FDOT	I-95 Widening	\$211 million	TxDOT	Spur 601	\$305 million

*only \$50.0 million in contractor financing

Potential for Puget Sound Gateway Project

- Implement as a “P3-lite” approach with small gap-financing provided by private sector
- WSDOT would still provide the majority of funding from public resources and public debt (toll revenue or triple-pledge bonds)
- WSDOT would maintain control of toll rates and provide all O&M services
- Private financing component would provide final financing piece and be replaced with public funding or debt shortly after construction completion
 - Public debt could replace the private financing. The debt component could be future GARVEEs or triple pledge bonds as capacity becomes available
- WSDOT would have to commit to its responsibility to repay the private financing. Since the private financing would be a small component of the overall funding and be short-term in nature, any incremental private financing costs would likely be immaterial
- May allow the full Gateway Project and legislation to proceed, even if public funding sources couldn’t completely fund the full project costs upfront

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DESIGN-BUILD FIXED PRICE/BEST DESIGN

Overview

The design-build fixed price/best design method is a project procurement and delivery option to consider when the full project scope exceeds the initially available budget. With a fixed price procurement, each proposal bid price is set among all proposers, and the procurement process and best value selection are based primarily on technical content of submitted proposals and the extent to which proposers include additional elements beyond a basic set of design elements in their proposal. By comparison, the more familiar best value approach to design-build procurement in Washington typically includes an evaluation of each unique proposal bid price along with how well the proposed design and project approach satisfy set project requirements.

For the fixed price/best design approach, the Agency defines a basic configuration that contains all elements that *must* be included within each proposer's scope and priced within the defined budget. The notion of best design comes from the extent to which any additional elements or improvements each proposer may choose to add to their scope while staying within the defined budget. The procurement process for fixed price/best design does not consider price because the budget is fixed and clearly defined ahead of time.

This white paper presents two methods of procuring and contracting design-build fixed price/best design contracts:

- *Values-Based Approach*: the Request for Proposals (RFP) provides qualitative guidance to proposing teams regarding the relative value the Agency places on certain types of additional improvements. The Agency evaluates how well the proposed additional elements achieve the stated project goals and objectives. An example from the Utah DOT's recently completed I-15 Core project is provided to illustrate this approach.
- *Additional Requested Elements (ARE) Approach*: the RFP provides specific additional requested elements that the Agency defines and proposers can choose to include. The Agency evaluates whether the proposers have incorporated the additional elements in accordance with project design requirements. An example from the Colorado DOT's current U.S. 36 project is provided to illustrate this approach.

Values-Based Approach to Best Design

In a values-based approach to best design, the Agency RFP clearly describes the project goals, a basic configuration of alignment, capacity, access, interchange and any other project characteristics that proposers must include in their proposal. The RFP also describes additional elements of scope in terms of performance design requirements, their purpose and the goals they are to achieve. If the proposer chooses to include any of the additional elements, they must develop a design that achieves these performance-oriented goals. This gives the

Contractor flexibility in what to design and how to accomplish the defined purpose and goals; all of which encourages innovation and creative solutions among the teams competing.

Because proposers will want to test their ideas for providing additional scope elements, including whether the Agency sees proposed ideas as complying with the purpose, goals and performance criteria, the fixed price/best design method can require more time and effort for proposers and Agency staff/consultants when compared to a best value design-build procurement:

- Before an RFP is issued, the Agency must identify and consider what additional types of scope items would be desirable but are beyond the basic scope elements. For each scope item, the Agency must create goals and values that can be provided to proposers to clearly indicate how much the Agency values the improvements – some may be of high value, while others may be of medium or low value. The proposer teams will use this information to weigh the anticipated added value in the proposal evaluations against their ability to include the items within the fixed price.
- While one-on-one meetings have become standard practice in best value design-build procurements, proposers will expect even greater opportunity to meet one-on-one with the Agency during a fixed price/best design process. The range of additional scope ideas that proposers may want to discuss and test with the DOT requires more extensive communication between the prospective Contractors and the Agency than would otherwise occur. More frequent interaction will require more Agency involvement – before, during and after the one-on-one meetings.

Example Values-Based Fixed Price/Best Design Project

The 24-mile I-15 Corridor Expansion (I-15 CORE) is the largest road construction project in the western U.S., and one of the three largest projects in the country. The Utah Department of Transportation (UDOT) developed the CORE as a fixed-price/best-design project to add additional capacity to I-15 in Utah County.

The Utah State legislature initially allocated \$2.6 billion for the work in 2008; however, the 2009 state legislature reduced that budget to \$1.7 billion. This budget cut posed a significant challenge for UDOT, which was mandated to do more with less and still meet public expectations. Using a fixed price/best design approach and proactive risk management throughout the project timeline, UDOT was able to stretch the approved budget to deliver the all the basic configuration scope plus additional elements with a design-build contract valued at \$1.1 billion, well within the \$1.7 billion revised overall project budget.

UDOT asked bidders to be creative and innovative in delivering the best project for the money. The winning proposal exceeded expectations, providing a total of 24 miles of full freeway

reconstruction, replacing 55 aging structures, providing 40-year concrete pavement and offering a five-year extended warranty on all the work.

Proposals were evaluated by defined criteria:

- Technical, must-have requirements
- Pass/Fail elements
- Project goals and values

and scored in three categories:

- 60% project definition (scope)
- 20% maintenance of traffic
- 20% schedule

UDOT's approach was to define value statements corresponding to each of the scoring categories. For example, in the highest valued category of project definition (scope), the RFP provided the following type of values guidance:

4.5.1.1.1 Value Statement

The Department values implementing as many improvements as possible to the I-15 corridor starting at the American Fork Main Street interchange and moving south through the Provo Center Street interchange. These improvements will provide infrastructure consistent with the Ultimate Infrastructure Configuration (UIC).

If a design-build team is able to extend the proposed Project south beyond the Provo Center Street interchange, the Department values creative, innovative solutions that address mainline congestion, ramp queuing and aging infrastructure within the corridor.

These solutions may be of lesser scope than the UIC. The Department believes that lengthening the Project to extend as far as Spanish Fork Main Street may provide more value to the public than completing the UIC from American Fork Main Street interchange to the Provo Center Street interchange. It is important, however, to maintain the future ability to further expand the freeway, with limited rework, to provide the cross-section defined in the UIC. To this end, the Department expects to purchase all right-of-way necessary to build the UIC between American Fork Main Street and Provo Center Street as part of I-15 CORE.

Accepted improvements will focus on relieving present and future mainline I-15 congestion and on improving the movement of traffic through interchanges. The concepts proposed by the design-build teams must have logical starting and ending points that allow traffic to transition as smoothly as possible from new to existing lane configurations.

Proposers were then instructed what submittal requirements were necessary to demonstrate a proposed approach within each category. For example in the project definition category, proposers were instructed to submit design information and also an assessment of regional mobility, taking into account the proposer's proposed improvements on the project.

Evaluation criteria were defined to measure the ability of each proposal to meet or exceed the project goals, values and requirements. UDOT evaluated proposals based upon quantitative and qualitative benefits, using defined factors. Each of the evaluation factors were identified as "HIGH," "MEDIUM" or "LOW," indicating the relative significance to UDOT. For example, in the highest valued category of project definition (scope), the following factors and their significance were specified:

- HIGH Number of I-15 lane and shoulder miles added or improved, by type and level of improvement.
- HIGH Number of interchanges reconstructed or improved and level of improvement.
- HIGH Operational metrics of mainline, at and between interchanges.
- HIGH Operational metrics of mainline transitions to existing facilities
- HIGH Level of improvement to regional mobility associated with mainline improvements using the results from the TDM, as listed below:
 - VMT
 - VHT
 - Average speed
 - Total delay
 - User costs
 - Percent VMT with V/C greater than or equal to 1 (for all links excluding centroid connectors)
- HIGH Level of improvement of the interchange operations using the results from the VISSIM models as listed below:
 - Delay
 - Speed
 - Density
 - Travel time index
 - Queuing

- MEDIUM Other operational improvements including the following:
 - Number and nature of decision points
 - Length of weave areas
 - Width and location of shoulders and refuge areas
 - Number of bicycle/pedestrian conflicts with traffic
 - Provision of clear zones
- MEDIUM Number of intersections improved and level of improvement
- LOW For areas between American Fork Main Street and Provo Center Street that will be constructed to less than full build out of the UIC:
 - Level of interim functionality
 - Amount of rework costs and traffic impacts required to complete full build-out,
 - 2020 and 2030 LOS
 - The associated year that the LOS crosses the D/E threshold
- LOW Operational metrics in cross street transitions to existing facilities
- LOW Extent and functionality of non-motorized improvements

UDOT considered this values-based approach a success because of the added value brought by the winning proposal: current number of lanes open both southbound and northbound during the majority of construction; 40-year concrete pavement along entire corridor an accelerated schedule to deliver the project two years earlier than UDOT required.

Advantages of values-based fixed price/best design

- Proposers have significant flexibility in structuring their proposals; i.e., whether to only submit the basic configuration or to include various levels of additional scope elements.
- Recent project examples have shown the Agency receives more overall scope under this approach than with a best value or ARE approach because the Agency is not limiting proposers to a specific design or specifically defined additional elements.
- The Agency can communicate their desired additional scope through the outcomes they value; for example additional mainline capacity, direct connections between certain roadways or longer pavement life.
- Bidders develop highest-value, creative solution for fixed construction budget
- Proposals are evaluated on meeting or exceeding defined criteria, based on project goals
- The values-based approach fosters competition, innovation

Disadvantages of values-based fixed price/best design

- During one-on-one meetings, proposers will push the Agency to define exactly how it will evaluate additional scope beyond the high/low value definition otherwise provided. Defining more specific evaluation criteria could limit the flexibility and range of what is actually proposed.

- If the Agency knows (and can define) specifically what additional elements it desires beyond the basic configuration, then identifying AREs (described below) may be a better approach than the best design method.

“ARE” Approach to Best Design

The fixed price/ARE method can also be effective when the full project scope exceeds the initially available funding. The procurement process is judged primarily on the technical approach and the scope elements that are added beyond the basic configuration and included within the pre-determined budget.

Like the fixed price/best design method, the Agency defines a “basic configuration” that includes high priority elements to be completed within the available project budget. However, a key difference from the fixed price/best design method is the Agency predetermines the AREs. AREs are specific, clearly defined items with defined boundaries and design standards. For example, AREs could include items such as one additional 12-foot lane from station x to station y, or a truck climbing lane from station c to station d. Proposers are encouraged to select additional elements from the Agency’s list, which reduces their flexibility in how to design each particular element, but increases clarity and design direction about the additional elements themselves compared to the best design method described earlier in this paper. The proposer must choose whether to include any of the defined AREs in their proposal while staying within the allowable budget.

Because a proposer must choose from among the defined AREs, the ARE method may not utilize the full project budget if the proposer is unable incorporate an entire ARE and stay within the budget. Since AREs are specifically defined, an ARE must be included in its entirety or not at all, which may cause a proposer to leave some items out of their submitted package. Proposals are judged based on the number of AREs incorporated into the project and on aspects of the technical design such as life expectancy, safety, quality or schedule.

AREs can be useful when there is more required project scope than budget, and when innovation is not the Agency’s highest priority.

Example ARE Fixed Price/Best Design Project

Colorado DOT’s (CDOT) US 36 Express Lanes design-build project is now underway to reconstruct part of the existing US 36 near Denver. The \$310 million project is led by CDOT, the Colorado High Performance Transportation Enterprise (HPTE), and the Regional Transportation District (RTD). It will reconstruct the existing US 36 pavement and widen the highway to add one express lane (toll managed lane) in each direction. It also includes other transportation improvements from Federal Boulevard to past the Interlocken Loop interchange along US 36.

The basic configuration added two new managed lanes, replaced three bridges, installed an ITS system and constructed portions of a bikeway. CDOT established the fixed budget for the project, and their number one goal was to maximize the scope and improvements of the project. Since CDOT and regional stakeholders had already defined specific additional elements they would like to have added, a more flexible approach to encourage proposer innovation on additional elements was not an issue on the project. All of the AREs were well-defined extensions of the baseline project.

During the procurement, the RFP identified a specific number of points that were available for the AREs across four different categories:

- 28 points for minimizing the operating and life cycle maintenance costs, and improving quality and safety;
- 5 points for beating the schedule;
- 12 points for minimizing inconvenience to the public; and
- 2 points for exceeding the workforce development program.

During proposal evaluations, CDOT reviewed AREs submitted by each team to determine their compatibility with the project requirements. Each proposer was awarded a fraction of the points within each category depending on how many of the defined AREs they included in their proposal. For example, if six AREs were defined in the RFP category for minimizing the operating and life cycle maintenance costs, and improving quality and safety, and a proposer submitted three AREs that were found to be compliant, that proposer would be awarded 14 points (three out of six AREs, so 50% of the available points within that category).

CDOT considers the ARE approach to best design to be successful for the US 36 project because of additional scope elements that were added into the contract by the winning proposal:

- Extending the terminus of the project from Interlocken Loop west to 88th Street in Louisville/Superior;
- Reconstructing the Sheridan Boulevard bridge over US 36, along with roadway approaches and ramp intersections;
- Reconstructing the US 36 bridge over the Burlington Northern Santa Fe Railway; and
- Improving RTD stations along the corridor, including new canopies with enhanced weather protection.

Advantages of AREs (compared to fixed price/best design)

- Agency is able to specifically define and prioritize the additional work items it desires proposers to include in their proposals.
- The process and evaluation of AREs are objective; proposers are given a straightforward plan for additional work items and how scoring for those additional items will be

completed in the procurement (points are awarded for complete AREs that are included; partial AREs are usually not acceptable).

Disadvantages of AREs (compared to fixed price/best design)

- By defining and prioritizing the AREs, the owner may be limiting creativity of the proposers to respond and use innovative approaches that achieve desired goals.
- It is more difficult to determine exactly how to prioritize and evaluate AREs and whether to evaluate completion of only part of the AREs.
- Defining the AREs may constrain what the proposers will provide to the Agency.
- The Agency can get the same information to the Proposers, while providing proposers with more flexibility, by defining what they value in the RFP and in industry discussions.

Factors to consider in comparing fixed price design-build variations:

- The fixed price/best design approach maximizes improvements within the defined budget.
- The fixed price/best design incentivizes proposers to utilize the full budget. As opposed to AREs, fixed price/best design values innovation and does not place the same degree of design limitations on the additional elements a proposer may offer, which can encourage more competition and creativity among proposers. Increasing competition and exploiting the budget can result in maximum improvements. Fixed price/best design relies on the Agency's ability to clearly define and consistently communicate project goals.
- The ARE approach is driven by specific elements that have been created by the Agency with the intent of achieving the project goals.

Additional Considerations for the Puget Sound Gateway Project

- WSDOT would define the basic configuration for the Puget Sound Gateway project as the initial phase now being developed with stakeholders.
- If the initial PSG phase could be delivered for less than the available project budget, the competitive pressure of a best design procurement (either using the values-based or ARE approach) could result in advancing some high value elements of the future phase to the initial phase project.
- WSDOT is already familiar with the ATC process; the fixed price/best design approach expands the ATC concept to expand the scope of the project within the fixed budget.
- WSDOT would maintain control of toll rates and O&M using design-build fixed price/best design.