Design-Build and Design-Bid-Build

Comparison of Overall Cost and Time

Question: How does the total cost and time to deliver a **$55,000,000 and 814 day** design-build project compare to using design-bid-build if both projects start at the same time?

Answer: Using design-build results in a **total cost savings of $6,457,345** and **total time savings of 656 days**.

	Project Delivery Activity (see graphic below)	**Design-Build**		**Design-Bid-Build**	
		Cost	**Time**	**Cost**	**Time**
A	**Preliminary Design** • Cost is assumed to be 25% of DBB Final Design (Activity H). • Time is assumed to be 25% of DBB Final Design (Activity H).	$1,488,404	183 days		
B	**DB Firm Selection** • Cost is two stipends at 0.15% of Final Design and Construction cost (Activity C). • Time is ad thru notice to proceed. (1)	$165,000	304 days		
C	**Final Design and Construction** • Cost is average of winning bids of 11 projects procured using the adjusted score DB process since January 2012 where the winning bid was not the lowest bid. • Time is average of time on these 11 DB projects.	**$55,000,000**	**814 days**		
D	**Construction Engineering Inspection** • Cost is 7.2% of Final Design and Construction (Activity C). (2)	$3,960,000	0 days		
E	**Cost and Time Overrun** (3) • Cost is 1.98% of Final Design and Construction (Activity C). • Time is 20.3% of Final Design and Construction (Activity C).	$1,089,000	165 days		
F	**Construction Engineering Inspection** • Cost is CEI cost per day (Activity D/ Activity C time) times overrun of contract time (Activity E time).	$802,703	0 days		
	Total	$62,505,107	1466 days		
G	**Procurement of Designer** • Time is average of past ten years from the Procurement Office.			$0	169 days
H	**Final Design** • Cost is 11% of DBB Construction cost (Activity J). • Time is assumed to be 2 years.			$5,953,617	730 days
I	**Select Contractor** • Time is ad thru notice to proceed. (4)			$0	152 days
J	**Construction** (5) • Cost is 94% of DB Final Design and Construction (Activity C) increased by 3% annual inflation. • Time is 110% of DB Final Design and Construction (Activity C).			$54,123,795	895 days
K	**Construction Engineering Inspection** • Cost is 10.1% of Construction cost (Activity J). (6)			$5,466,503	0 days
L	**Cost and Time Overrun** (7) • Cost is 4.33% of Construction (Activity J). • Time is 19.7% of Construction (Activity J).			$2,343,560	176 days
M	**Construction Engineering Inspection** • Cost is CEI cost per day (Activity K/ Activity J time) times overrun of contract time (Activity L time).			$1,074,977	
	Total			$68,962,452	2122 days

(1) **DB Firm Selection:** Cost is stipends paid to top two non-winning responsive firms. Time is eight months from advertisement to letting plus two months from letting to notice to proceed.

(2) **Construction Engineering and Inspection:** 7.2% is the average CEI cost on DB contracts between $30-$70M from 2008- 2012. The database for this date range consists of 11 DB contracts and 47 DBB contracts.

(3) **Cost and Time Overrun:** The percentages are the averages of DB contracts between $30- $70M from 2008- 2012. The database for this date range consists of 11 DB contracts and 47 DBB contracts.

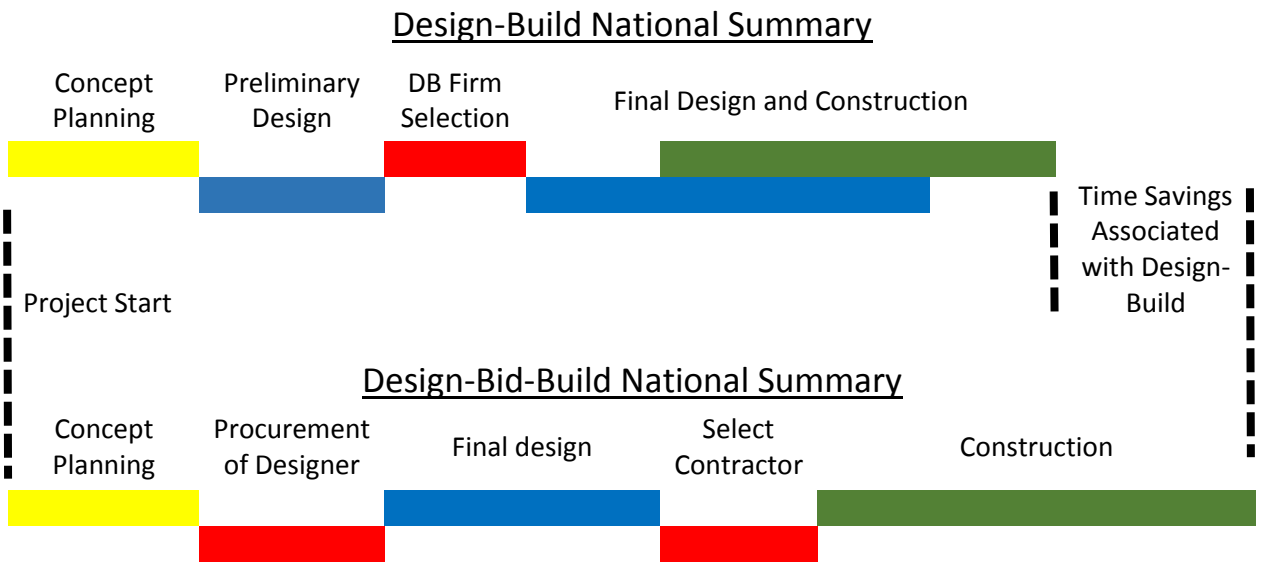
(4) **Select Contractor:** Time is 3 months from plans to Tallahassee to letting plus 2 months from letting to notice to proceed.

(5) **Construction:** 94% assumes a design cost of 6% for DB contracts. The 3% annual inflation is applied to the time difference between lettings. 110% is average of ratio of time on DBB contracts to DB contracts between $30-$70M from 2008- 2012. The database for this date range consists of 11 DB contracts and 47 DBB contracts.

(6) **Construction Engineering and Inspection:** 10.1% is the average CEI cost on DBB contracts between $30-$70M from 2008- 2012. The database for this date range consists of 11 DB contracts and 47 DBB contracts.

(7) **Cost and Time Overrun:** The percentages are the averages of DBB contracts between $30- $70M from 2008- 2012. The database for this date range consists of 11 DB contracts and 47 DBB contracts.

Comparison of Project Delivery Activities



Source: From Dr. Keith Molenaar, University of Colorado at Boulder in the Design-Build Effectiveness Study Final Report dated January 2006 prepared for USDOT- FHWA. Some terms in the graphic have been modified to be consistent with FDOT terms. Link below is to referenced FHWA report: https://www.fhwa.dot.gov/reports/designbuild/designbuild4.htm

Comparison of Best Value Selection to Low Bid Selection

Question: Is the traveling public and the Department getting any value for the apparent increase in cost represented by the difference between the winning price and the lowest price received for the project?

Answer: Yes. The price submitted by each proposer reflects that Design-Build Firm's approach and costing of the design as reflected in their technical proposals. The construction means and methods and designs of the proposers are not the same, nor of equal value and hence the difference in the evaluation of their technical proposal. While the price received with each Design-Build Firm's price proposal illustrates the price tag so to speak for the cost to design and construct a project it is not all encompassing of the value the Department receives or the benefits the motorist experiences. The innovative aspects included in the Design-Build Firm's technical proposal that add value must be considered when determining the overall value to the Department and traveling public.

The Department has received price proposals for 42 design-build projects during the time period January 2012 to January 2014. Thirty one or 74% were awarded to the proposer which had the lowest bid price and lowest adjusted score. Eleven of the 42 or 26% of the contracts were awarded to Design-Build Firms that were not the lowest price proposal received by the Department.

The value of the innovative aspects included in a Design-Build Firm's proposal will be discussed in the following. The proposals often provide better design features than the minimum acceptable design driven by the primary goal of providing the most cost effective design with minimal risk to the Department that is prevalent in the design-bid-build project procurements. The better design is often made possible by secondary benefits in cost and time savings to the Design-Build Firm and their willingness to take on risks that are not practical or advisable for the Department to assume in the design for design-bid-build project procurement. The innovative aspects include design features that save future maintenance costs and unique approaches to construction delivering the project sooner. Some of the innovative concepts are known to provide a facility with greater level of operational safety or service level when compared to minimum acceptable design customary in the design-bid-build project procurements. Often the proposers will provide longer warranty periods for elements of work that the Department already requires warranties and occasionally a warranty will be provided for elements where one is not presently required by the Department. The following are examples of the innovative aspects from some of the contracts the Department awarded to Design-Build Firms that were not the lowest price proposal received by the Department:

1. D5 E5R52 Wekiva – Winning bid $23.6M, lowest bid $21.6M or a difference of $2.0M
    a. Interchange modifications which provided now at today's prices for future capacity improvement saving FDOT an estimated $5M
    b. Roadway design modification to reduce the amount of offsite fill needed minimizing disruptions to surrounding neighborhoods, improving safety, and reducing congestion by reducing hauling equipment from public roads
    c. Included walls wrapping around bridge approaches reducing the cost of maintaining slopes and facilitated future widening at a reduced cost
    d. Drainage design which eliminated offsite conveyance ditches reducing maintenance costs

2. D6 E6I05 SR 826 (Palmetto Express) – Winning bid $243.6M, lowest bid $242.9M or a difference of $700K

    While the difference may be considered small percentage wise, 0.3%, a global look at the total effect of using the best value approach reveals significant value added for the Department. The winning proposer was neither the lowest price nor the highest scored Technical Proposal. However, the proposal did include a substantial difference in the contract time (1175 versus 1420 or 245 days). The contract provided an incentive of $5.25M for completing construction

early. Since this project includes Tolled Express Lanes the early completion means revenue will be generated earlier for the Department. On balance when taking into consideration the additional cost of the incentive provision and the difference in the bids received and offsetting these with the saving in oversight costs, cost overruns, and the additional net increase in toll revenue the Department would realize a net benefit of $7.5M or 3%.

3. Turnpike E8M05 Conversion of tolling equipment at Sawgrass– Winning bid $40.7M, lowest bid $39.6M or a difference of $1M
    a. New toll buildings provided versus rehabilitating existing
    b. Toll Building location modified to eliminate drainage needs, Intelligent Transport System devices, and lighting impacts
    c. Design solution provided for future mainline expansion with less total reconstruction

4. D4 E4M77 I 95 – Winning bid $50.6M, lowest bid $49M or a difference of $1.65M
    a. MOT approach provided greater safety for motorist and workers
        i. The proposal provided the least impact to the traveling public by shifting traffic to one side of the roadway to construct the NB roadway
        ii. One long single work zone single was created with minimal shifts in traffic improving driver expectancy.
    b. The drainage design involved linear dry swales instead of wet detention ditches shown in the RFP avoiding impacts and exceeding the goals of the Request for Proposals to a greater degree than the other proposals.
    c. The proposal indicated several existing DMS would be replaced instead of relocated.

5. D7 E7H90 Gandy Boulevard - Winning bid $82.9M, lowest bid $79.7M or a difference of $3.2M
    a. The proposal provided greater value to the community and facilitated alternate modes of transportation :
        i. A huge access benefit was achieved by reconfiguration of 94th Street to allow cross-through access to both sides of Gandy Boulevard.
        ii. Continuous bike lanes and sidewalks provided for the projects limits
    b. Reconfiguration of 4th Street Interchange reducing bridge length and therefore reducing future maintenance.
    c. Elimination of bridge structure at 16th Street since Gandy will be grade separated at 94th Street providing for cross-street access. Minimized utility relocations at 16th Street.
    d. EB off-ramp to 94th Street will be improved by channelization, additional signing, and increased distance between EB Off-ramp and South Frontage Road.
    e. Preserved room for ponds at I-275 and Gandy

6. D7 E7I30 I 75 – Winning bid $47.8M lowest bid $45.6M or a difference of $1.6M
    a. Stormwater Management Facilities were designed shallow to eliminate pond liners reducing future maintenance.
    b. Stormwater Management Facilities will be designed for future expansion of I-75.
    c. Provision of full depth pavement for shoulders on first 230’ of project within traffic management plan and permanent construction.
    d. Proposal will stockpile excess good material on-site for future use.
    e. Cross slopes will be improved to address lane departure crash concerns.
    f. Proposed protected truck turnaround in median for enhanced safety.
    g. Proposal minimizes utility relocations with enhanced design and construction aspects related to future expansion.
    h. Proposal includes lengthening acceleration lanes at CR 41 to reduce crashes.
    i. Traffic Management Plans include using law enforcement officers during construction for speed control.

7. D7 E7I34 I 75 – Winning bid $37.3M, lowest bid $35.2M or a difference of $3.2M
    a. Drainage ponds proposed at locations of ultimate construction sized only for 6-lanes now but pipes sized to accommodate expansion. Recognize this will minimize rework in future.
    b. Traffic Management Plan includes for fill transportation operations in median (conveyor system to move earthworks) to minimize ingress/egress points along either side of high speed I-75. This was viewed as significant efficiency and safety benefit for all stakeholders.
    c. Proposed ITS infrastructure including overhead supports will be outside clear zone for enhanced safety.

There are many benefits in the use of the design-build project procurement process as illustrated in this paper. The Department is looked at nationally as a leader in the development of a Design-Build program and will continue to finds ways of improving the process including the selection of projects, fostering greater innovation, and providing a greater value for the motorist.