1. Cost plus Time (A+B)

What is it?

Cost + Time, also commonly referred to as A+B, is a selection method used in procuring construction services where the “A” or cost portion is the bid amount and the “B” or time portion is the proposed project duration for the work. The “B” portion is multiplied by a value per day, also referred to as Road User Cost (RUC), which is established by the Agency prior to reviewing the proposals. The agency then awards the contract to the bidder whose proposal has the lowest sum of “A” + “B” (*1).*

Why use it?

Cost + Time procurement often provides for reduced overall project time. The NCHRP Synthesis 293 (*2*) states that when using Cost + Time, the project is typically completed earlier than initially estimated by the contractor.

The California Department of Transportation Guidelines For Use of A+B Bidding Provisions (*3*) provides the following benefits of Cost + Time contracting:

* Reduces construction-induced congestion and delays;
* Encourages bidders to develop more detailed and well thought out plans;
* Encourages contractors to develop innovative means of reducing overall construction time at the lowest cost;
* Encourages contractors to schedule construction operations in a manner that maximizes the efficiencies of crews and equipment;
* Reduces complaints related to congestion from road users and local communities;
* Lessens environmental impacts and reduces pollution related to construction.

What does it do?

Cost + Time procurement encourages bidders to consider the time the project construction will require and how to incorporate innovative means and methods to reduce this time.

How to use it?

According to Caltrans (*3*), other than a few specific exceptions, only projects that have an estimated cost of $5 million or more and a daily RUC of $5,000 or more should be considered for A+B bidding. Once the agency establishes these parameters, the project engineers establish a maximum number of construction days for bids to be considered responsive. Any bids that exceed this amount are considered unresponsive and are discarded. Next, the project engineers determine the daily RUC for the time portion of the bids.

To evaluate the proposals, the agency will multiply the construction duration estimate by the RUC to create the time portion of the bid. This “B” value is added to the project cost (the “A” portion) to generate the Total bid. The bidding firm with the lowest Total A+B is awarded the contract.

When to use it?

A study performed on 101 projects that utilized Cost + Time procurement found that 76% of the projects were related to restoration, rehabilitation, or reconstruction type projects (*4*). The projects were typically characterized as having substantial traffic management requirements and road users were frequently subject to construction work zones. Therefore, Cost + Time procurement is best suited for highway projects in urban settings with high volumes of road users. Also, Cost + Time is suitable for projects that severely impact local businesses during the construction and for projects with a tightly constrained end date (*5*). Some STAs use cost plus time procurement along with incentives/disincentives. This has been shown to accelerate the construction schedule and reduce the duration of construction *(1)*.

Limitations?

Cost plus time is not a procurement procedure for all projects. Issues with using Cost + time include the risk associated with changes and delays that are beyond the control of the awarded firm (6). Problems can arise for adjusting a contract time due to unforeseen conditions, STA implemented changes, and delays due to uncontrollable situations. Therefore, it is critical to work out any delay risks associated with third-parties (railroads, ROW, utilities, etc) prior to bidding and constructing the project. Further, the STA will need to make sure that the awarded firm can accurately predict the duration of all activities of the project during the procurement phase. Due to this, projects that are large and complex are not ideal for cost + time procurement *(6)*.

Another issue to consider with cost + time bidding is the potential for increased cost of the project *(6)*. STAs will need to consider that shortening the duration of a project will cost a premium due to acceleration, aggressive management of subcontractors, and/or the use of specialty equipment. For example, a bidding firm may see an opportunity to reduce the total impacts on a project with a shorter duration solution that increases the primary cost items, but in return would reduce the impact on overall traffic control cost. However, a bidding firm would not likely want to bid the shorter duration as savings associated with traffic control are not shared with the firm. To avoid this situation, STAs may want to implement incentives/disincentives in contracting with the selected firm *(6)*.

Other limitations to consider are (7):

* Contractor must take time to develop a reliable schedule
* Contract changes are magnified, which means when there are too many changes, the advantages of cost + time are nullified
* More resources might be needed for contract administration
* More intense negotiations for additional work because of timeliness is critical

Who uses it?

Arkansas, California, Georgia, Hawaii, Idaho, Illinois, Iowa, Maine, Minnesota, Mississippi, Missouri, Nebraska, Nevada, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Vermont, Washington State

Example

The Minnesota Department of Transportation has experience with cost plus time procurement. Two projects are presented below that used Cost plus time during procurement of the construction team (*7*).

*Project 1) MnDOT State Project #1809-55: Major Highway Expansion of Highway TH 371*

* Project Letting: March 14, 2003
* Road User Cost (RUC) per day: $10,000
* Incentives per day: $10,000 with a max of 25 days
* Disincentive per day: $10,000
* Project Awarded to Bid 1 with the lowest combined A+B of $17,589,834
* Actual Project Duration: 170 Days
* Incentives Paid: $250,000
* Incentives Paid as Percent of Bid: 1.6%
* Disincentives Charged: None

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| Project 1 Bid Results | | | | |
| Eng. Est. | $17,436,246 | Eng. Est. | 227 Days | Total A+B (Bid + Duration x $10,000) |
| Bid 1 | $15,569,834 | Bid 1 | 202 Days | $15,569,834 + 202\*$10,000 = $17,589,834 |
| Bid 2 | $15,602,319 | Bid 2 | 206 Days | $15,602,319 + 206\*$10,000 = $17,662,319 |
| Bid 3 | $16,457,663 | Bid 3 | 202 Days | $16,457,663 + 202\*$10,000 = $18,477,663 |
| Bid 4 | $17,108,075 | Bid 4 | 227 Days | $17,108,075 + 227\*$10,000 = $19,128,075 |
| Bid 5 | $17,431,114 | Bid 5 | 227 Days | $17,431,114 + 227\*$10,000 = $19,701,114 |
| Bid 6 | $17,797,742 | Bid 6 | 215 Days | $17,797,742 + 215\*$10,000 = $19,947,742 |
| Bid 7 | $17,837,766 | Bid 7 | 227 Days | $17,837,766 + 227\*$10,000 = $20,107,776 |
| Bid 8 | $18,200,639 | Bid 8 | 227 Days | $18,200,639 + 227\*$10,000 = $20,470,639 |
| Bid 9 | $18,430,000 | Bid 9 | 227 Days | $18,430,000 + 277\*$10,000 = $20,700,000 |

*Project 2) MnDOT State Project #2006-21: Detour Project – Reconstruction of TH 56*

* Project Letting: December 16, 2005
* Road User Cost (RUC) per day: $28,000
* Incentives per day: None
* Disincentives: $5,000
* Contract Awarded to Bid 1 with a lowest Total A+B of $1,523,692
* Actual Project Duration: 5.5 Days
* Incentives Paid: Not Applicable
* Incentives Paid as Percent of Bid: Not Applicable
* Disincentives Charged: None

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| Bid Results | | | | |
| Eng. Est. | $1,259,572 | Eng. Est. | 15 Days | Total A+B (Bid + Duration x $28,000) |
| Bid 1 | $1,355,692 | Bid 1 | 6 Days | $1,355,692+ 6\*$28,000 = $1,523,692 |
| Bid 2 | $1,394,017 | Bid 2 | 7 Days | $1,394,017 + 7\*$28,000 = $1,590,017 |
| Bid 3 | $1,449,919 | Bid 3 | 10 Days | $1,449,919 + 10\*$28,000 = $1,729,919 |
| Bid 4 | $1,512,212 | Bid 4 | 5 Days | $1,512,212 + 5\*$28,000 = $1,652,212 |
| Bid 5 | $1,522,081 | Bid 5 | 15 Days | $1,522,081 + 15\*$28,000 = $1,942,081 |
| Bid 6 | $1,619,712 | Bid 6 | 15 Days | $1,619,712 + 15\*$28,000 = $2,039,712 |

References

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2. Anderson, S.D. and G.L. Ullman. *NCHRP Synthesis 293:* *Reducing and Mitigating Impacts of Lane Occupancy during Construction and Maintenance*. National Cooperative Highway Research Program, Transportation Research Board, Washington, DC, 2000.
3. California Department of Transportation (Caltrans). *Guidelines for Use of A+B Bidding Provision.* Sept. 2002, <http://www.dot.ca.gov/hq/oppd/design/m093002.pdf> [Accessed September 22, 2013].
4. Herbsman, Zohar J. A+B Bidding Method – Hidden Success Story for Highway Construction. *Journal of Construction Engineering Management*, American Society of Civil Engineers, Vol. 121, No. 4, 1995, pp. 430-437.
5. Anderson, Stuart D., and Jeffrey S. Russell. *NCHRP Report 451:* *Guidelines for Warranty, Multi-Parameter, and Best Value Contracting*. National Cooperative Highway Research Program, Transportation Research Board, Washington, DC, 2001.
6. Washington Department of Transportation (WSDOT). *A+B Bidding*, 2014, <http://www.wsdot.wa.gov/Projects/delivery/alternative/ABBidding> [Accessed October 23, 2013].
7. Minnesota Department of Transportation (MnDOT), *Innovative Contracting Guidelines*, Office of Construction and Innovative Contracting, St. Paul, MN, Dec. 2008.