CONSTRUCTION CONTRACTING OPTIONS

Cost:	●○○○○
Time:	**Immediate**
Impact:	**Spot**
Who:	**City/State**
Hurdles:	**None**

Description

Contracting options can play an important role in mitigating the congestion and delay experienced during major road construction projects. These options can reduce the time of completion thereby limiting how long drivers may experience abnormal traffic. They can also ensure corridors are properly maintained on a regular basis or reduce the cost of the project, allowing funds to be used for other needed projects.

There are several contracting options that planners can use:

- Design-Build.
- A+B Bidding.
- Job Order Contracting.
- Incentive/Disincentive.

The design-build contracting option involves executing a single contract for both the design and the construction of a project. Design-build contracting is advantageous for the owner agency by streamlining coordination between design and construction activities and typically reducing the overall duration of design and construction process. This option is most appropriate for medium to large projects that have high incentives to expedite construction.

The A+B bidding process includes both the contract bid items and the time needed for project completion multiplied by a daily value of user costs that are incurred while the project is ongoing. This method persuades the contracting company to minimize the time needed on high priority projects. The driver cost is estimated from the anticipated delay caused by lane and route closures, and differs from project to project.

Job order contracting allows the governing agency (city officials or TxDOT) to provide the contractor with a contract that includes a negotiated and fixed price for the project. This option encourages contractors to bid on a project based on the required labor, material, and procurement costs. The contractor is provided with work orders that include a specified completion date in an effort to ensure all tasks are completed in a modest amount of time, keeping the project on schedule.

Incentive/disincentive clauses can be used in conjunction with other contract options to promote finishing the project early and dissuade contractors from falling behind schedule. This technique can be used on the project as a whole, at milestone completions, or at substantial completion. The schedules can also state when particular milestones or a majority of the project is expected to be completed.

The primary purpose of using a contracting option is to promote the quick completion of projects. This reduces the overall effect placed on the drivers using that roadway segment.

For more information, please refer to: http://mobility.tamu.edu/mip/strategies.php.

mobility INVESTMENT PRIORITIES

Target Market

Congested Work Zone Areas or Important Projects

Roadways often become more congested during construction periods, resulting in more wasted time, fuel, and money for the average driver. The project may also be the key to reducing current congestion levels in an entire area when a number of projects are being sequenced so as to minimize overall impacts to travelers. If projects are kept on schedule and finished in the shortest time period, traffic can return to its normal or improved flow and reduce costs to the city, state, and driver.

How Will This Help?

- Contracting options can reduce delay for drivers by rewarding innovation, efficiency, and early completion. Contracting options can be used to punish those that finish late. The available time period should be stated in the contract to promote adherence to the agreed upon schedule.
- Incentives, disincentives, and other scheduling techniques encourage contractors to creatively mitigate congestion in work zones to reduce project time. Incentive funds can offset increased construction or mitigation costs that a contractor has available, but cannot justify using strictly on the basis of a low-bid project. Rewarding the contractors for reducing their impacts and keeping to the schedule while punishing those that continually fail to meet the time schedule ensures that congestion caused by construction are reduced to the furthest extent. The rigid schedule also prevents as little traffic obstruction as possible.
- Certain contracting options can eliminate red tape that prolongs project times and increases congestion. The agencies can save time and money by agreeing to the project cost in the contract and using that as a fixed point rather than using the traditional bid method.
- Certain contracting options can also help lower construction costs. In some cases, the governing agency retains the right to end the agreement when the construction costs exceed the minimums found in the contract, again saving costs for the project by preventing the contractor from going over budget.

Implementation Examples

Interstate 10 (Katy Freeway) Reconstruction, Houston, Texas: The $2.64 billion Katy Freeway reconstruction project was, at the time, one of the largest projects in TxDOT history. Serving approximately 280,000 vehicles per day (vpd), significant attempts were made to ensure that the project was completed in the shortest time feasible and with as minimal impact as possible to the public. A 24/7 work schedule was adopted (including holidays), and both interim and project completion milestone incentives and disincentives were incorporated into the contracts. Lane rental fees were also used to encourage constrained timeframes for major closures.

Overall, the contracting options were highly successful in getting this highly-complex project completed. TxDOT paid a total of $50.9 million to the contractors for meeting project milestones, whereas early completion incentives cost TxDOT an additional $7.5 million. Lane rental fees assessments resulted in another $3.7 million in credit to the contractors. While fairly significant numbers themselves, these incentives and credits together still only represented 2.4 percent of the total cost of the project.

Yerba Buena Island (YBI) Bay Bridge Temporary Bypass, San Francisco, California: As part of the San Francisco-Oakland Bay Bridge replacement project, a 348-ft section of the YBI viaduct had to be retrofitted with a detour to allow completion of the new bridge tie-in. The existing bridge is a critical commuter link between San Francisco and Oakland, and so could not be closed for long periods of time to perform the work. The project goal was to construct the viaduct detour adjacent to the existing viaduct, and then remove the existing viaduct section and slide the detour section into place over the 2007 Labor Day weekend.

Originally, the project was bid as an A+B contract. The value assigned to the "B" portion was $100,000 per day, based on potential user and owner costs of not having the detour in place on time. Likewise, the liquidated damages portion of the contract was also set at $100,000 for each day the contract lasted beyond the scheduled duration. The contract was crafted as a performance-based, and no interim milestone incentives or disincentives were included. However, after the award of the contract, Caltrans did add some incentives (through a contract change order) for the Labor Day weekend tie-in effort to encourage the contractor to complete the tie-in swiftly.

Application Principles and Techniques

The application of these contracting options depends on the project type and size. In all cases, it is important that financial incentives used are significant enough to motivate the contractor to be innovative to complete the project as quickly as possible. Relative to other contracting types, design-build contracting is relatively new to the field of highway construction, and so agencies who are considering its use should spend adequate time reviewing literature on the concept (see references at the end of this document for examples) and talking to agencies that have D-B experience.

Typically, the A+B bidding process is applied to projects having a large community and economic impact. Projects that involve frequent lane closures or detours that result in higher costs and delay, safety concerns that impact the local community, traffic control phasing to reduce construction time, and minimal utility disruptions, design uncertainties, or land management problems are generally good options for this type of contracting. This option can also be used with incentive/disincentive and milestone/substantial completion options. Job ordering contracting involves awarding long-term contracts for a wide variety of renovation, repair, and construction projects. The selected contractor provides on-call services that are assigned by the owner agency through the assignment of pre-defined unit costs that will be paid for various tasks. Individual jobs are not necessarily defined, but a maximum potential amount of work (and possibly a minimum as well) are established.

It is possible to combine contracting options to fit the needs of a specific project or project phase. When this is done, it is important to consider the consequences of each of the strategies upon any other strategies included in the contract. For example, peak-hour lane closure restriction penalties are likely to be ignored if they are minor in comparison to the daily incentive to complete the project early.

Issues

There are no major legal implementation issues to greatly inhibit the use of the different contracting options described in this document. It is important that specific work restrictions such as non-work dates, peak-hour lane closure restrictions, nighttime noise or vibration limitations, or regulations governing material hauling logistics be established up front in the bid documents. Furthermore, if a region wishes to use a relatively new option (such as design-build), policy guidelines should be developed to govern project oversight, bid, review, and

awarding. Standards for estimating traveler costs, including the cost of delay, should also be established.

Who Is Responsible?

The responsibility of contracting primarily falls on the agency in charge, or the owner of the project. If the construction is being done on a local city street, city government is typically in charge of seeking the contractor and decisions on whether to utilize one of the discussed options. If the construction pertains to a state highway, the local TxDOT office has the responsibility of awarding the project to a qualified contractor while using a contracting option. It is also the responsibility of the contractor and construction workers to complete the project in the allotted time schedule and budget, or as close as possible, and to disrupt traffic as little as possible.

Project Timeframe

Contracting options do not take a significant time to implement. They are selected by the overseeing agency and presented to the bidding contractors. These options are implemented immediately, but there is a required timeframe that corresponds to making sure that all parties involved are aware of and agree on the time schedule and budget of the project.

Consequently, a decision to use a contracting option to accelerate construction should be made early in the project development process, so that any possible issues that could derail acceleration efforts (such as right-of-way acquisition issues, utility accommodations, or railroad agreements) can be minimized.

Cost

Depending on the strategy selected, the added cost of the construction contracting options (over a standard design-bid-build process) can range from minimal to a modest percentage of the project budget. Meanwhile, the costs felt by the travelers, residents, and business owners are typically reduced.

Data Needs

Implementing a construction contracting option requires only minimal amounts of information to evaluate and implement. The data needed corresponds to the basic timeline the project will follow. Also useful are traffic volumes, standard travel times, and delay on the roadway segment in an effort to forecast the effect on traffic during the construction period.

Best Practice for Using This Strategy

- Type of Location: Apply to projects that are likely to have high user costs during construction, or which will significantly benefit users once construction is complete.
- Agency Practices: Specifically define any work restrictions in the project contract (schedule, vibration, noise, regulations governing work or logistics).
- Frequency of Reanalysis: Examine the use of this technique before the contract is initiated.
- Supporting Policies or Actions Needed: Set an aggressive work schedule and provide adequate incentives to encourage innovation and early project or project phase completion. Make the decision to use one or more of these contracting options early in project development so that any possible issues that could derail the acceleration effort can be first addressed.
- Complementary Strategies: Consider ability to delay construction start date to ensure higher likelihood of success. Coordinate multiple strategies when used together on a project.

For More Information

Accelerated Construction Strategies Guideline. Texas Department of Transportation, Austin, TX. September 2003. Accessible at ftp://ftp.dot.state.tx.us/pub/txdot-info/cmd/construction.pdf.

Best Practices in Accelerated Construction Techniques. Scan Team Report, NCHRP Project 20-68A, Scan 07-02. TRB, National Research Council, Washington, DC. November 2009. Accessible at http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-68A_07-02.pdf.

Mobility Improvement Checklist: Managing Construction and Maintenance Activity, Volume 5. Texas Transportation Institute, Texas A&M University, College Station, TX, September, 2004.

Selection and Evaluation of Alternative Contracting Methods to Accelerate Project Completion. NCHRP Synthesis 379. TRB, National Research Council, Washington, DC. 2008. Accessible at http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_379.pdf.