

## **Contracting Methods Manual**

### Selection Criteria

In determining the application of the contracting methods in this manual, the INDOT Project Manager should follow the process described below.

- I. Project Criteria** - In general, the following project types should not be considered for any of the contracting methods listed in this manual.
  - A. Projects with little or no impact to traffic
  - B. Maintenance and landscaping type contracts.
  - C. Any project to which an economic benefit of one of the listed methods cannot be identified.
  
- II. District Organization and Responsibilities**
  - A. District Projects
    - 1. When a project clears scoping and planning, the District Project Manager (DPM) shall evaluate it for possible innovative contracting methods. Table 1(See Appendix) is the evaluation table that should be consulted at this stage. If a project is deemed to be a match with an innovative contracting option it will be submitted to District Construction for review and approval.
    - 2. District Construction will review and take action either to approve, reject or request additional information on the candidate project. For projects above the authority level of District Construction, the request will be forwarded to the Central Office Project Management Office for review and approval.
    - 3. The DPM will work with the designer to ensure that the contracting method selected is incorporated into the contract documents for letting.
    - 4. Whenever a project utilizes an innovative contracting method, the DPM will notify the Central Office Division of Contract Administration, the Central Office Program Manager, and Central Office Production.

### III. Innovative Contracting Methods

#### A. A + B Contracting

##### **Description**

A + B Contracting is a contracting method in which submitted bids include a cost and a time in which the project should be completed, within DOT reason and protocol. The A portion is the sum bid for contract work items, including equipment, material, and labor. The B portion is the time in defined time periods proposed by the bidder to complete the project or a portion of the project, multiplied by a daily road user cost. A maximum number of time periods must be defined. "Lane Rental" contracts time periods may be hours or fractions.

Part B is established by adding together the costs for each of the following if applicable or combinations:

1. Peak-traffic-volume lane-closure periods = (no. of periods) x (cost/lane/period);
2. Non-peak-traffic-volume lane = (no. of periods) x (cost/ lane/period); plus
3. Contract days = (no. of days) x (cost/day)
4. Ramp closure days = (no. of days) x (cost/day)
5. Road closure days = (no. of days) x (cost/day)

Based on the analysis of INDOT traffic data, the AADT values listed below should be used to identify high traffic volumes.

<b>Type of Highway</b>	<b>High Traffic Value (AADT)</b>
Interstate (Four Lanes)	≥51,000
Interstate (Six or More Lanes)	≥133,000
US Routes (Two Lanes)	≥21,050
US Routes (Four Lanes)	≥28,500
State Roads	≥12,000

This contract method may also include Incentives and Disincentives towards the progress of a project to award timely completion and charge for lack of efficiency. A + B Contracting is effective in many instances. It has been suggested by AASHTO that A + B contracting is extremely useful in projects that have high road use delay impacts, as

well as in projects that result in long detours, in areas that include high economic or social changes, and projects with high accident probability or safety concern. A + B Contracting is useful when DOT personnel need contractor input on work phases and timetables. A + B Contracting can be significantly deterred when utility relocations and environmental problems arise. Also, this contracting method can result in higher internal cost due to increased hours for inspections and monitoring. A + B Contracting was reviewed in 9 recent cases that utilized it and the findings showed that contractors and DOTs preferred A + B contracting in almost all instances compared to other innovative contracting. As this new source of contracting is further utilized, it has become apparent that its method is very beneficial and time-efficient. A + B Contracting is an innovative and successful way for project delivery, but only if ROW and other factors are taken care of well in advance of construction and implementation of A + B.

The contract must clearly define what constitutes the start and the completion of the B portion work. Both may differ from the start or completion of the project. For example, the B time might not begin until a detour is implemented, a bridge closed, or traffic is otherwise impacted. This allows the contractor time to fabricate and deliver steel, obtain mix design approval, and do other pre-construction planning. However, it is necessary to define in detail what is expected of the contractor. This can be done through the plans and by detailed description in the special provisions. Work to be completed must be clearly stated. Off-road items such as landscaping, sidewalks or other items that could be performed without disrupting traffic should be addressed. If the intent is to get the roadway open to traffic as soon as possible, off-road items may be excluded from the B portion work.

The Appendix contains a special provision for an A+B contract and a sample of the B portion.

#### *“Lane Rental”*

The goal of the lane rental concept is to encourage contractors to minimize road user impacts during construction. Under the lane rental concept, a provision for a rental fee assessment is included in the contract. The lane rental fee is based on the estimated cost of delay or inconvenience to the road user during the rental period. The fee is assessed for the time that the contractor occupies or obstructs part of the roadway and is deducted from the monthly progress payments.

The rental fee rates are stated in the bidding proposal in dollars per lane per time period, which could be daily, hourly, or fractions of an hour. For many early lane rental projects, neither the contractor nor the contracting agency gives an indication as to the anticipated amount of time for which the assessment will apply and the low bid was determined solely on the lowest amount bid for the contract items. However, Indiana and Florida have included the lane rental bid in the determination of the low bid similar to A + B bidding.

Five states have used lane rental and reported favorable results under SEP-14. SEP-14 is Special Experimental Project No. 14 - Innovative Contracting." SEP-14 remains as a functional experimental program that may be used to evaluate promising non-traditional contracting techniques. lane rental was declared optional on May 4, 1995, and is no longer considered experimental. Since it was declared operational, a number of other states have evaluated the lane rental method.

### **Project Type Recommendations**

- Reconstruction, rehabilitation, and remediation projects in urban settings where high traffic volumes exists and road user costs are high. Some agencies specify a minimum threshold RUC level (\$2,000 - \$3,000 per day). The monetary benefit to the highway user equals or exceeds the Contractor's costs to finish early and earn the maximum incentive.
- Major roadways, bridges, and interchanges with high ADT counts, for which alternate routes or detours are not feasible.
- Lane rental is also more successful when applied to smaller, shorter jobs, because it is difficult to estimate the required lane closures on a job that is large, complex, or runs for a long time.
- A contractor can accurately schedule the amount of necessary lane closures to complete the work as described.
- Lane "closures" can be well defined.
- Opportunities exist to reduce closure times.
- Road user costs are substantial enough to offset potentially higher construction costs.
- Safety concerns, or significant impacts to the local community or economy during construction warrant expediting the project.
- Traffic control phasing can be structured to maximize a contractor's ability to reduce the duration of construction.
- The project has limited design complexity and is relatively free of utility conflicts, design uncertainties, or right-of-way issues that may impact the bid letting date or the critical project schedule.
- A+B bidding is often used with I/D provisions. The inclusion of I/D provisions with A+B bidding would not be necessary for projects that are not required to finish by a specific completion date.

### Advantages

- Reduces contract time
- Minimizes time/cost impacts to traveling public for projects with high ADT and traffic impacts during construction
- Promotes innovative scheduling on projects that do not require all work to be completed sequentially
- Encourages contractors to maximize efficiency of crews and equipment
- Typically encourages greater coordination between the prime bidders and their subcontractors prior to bid to develop an achievable time component estimate

### Disadvantages

- Potential for increased costs and delay claims due to utility and third party coordination problems or lack of timely agency reviews
- Contractors may sacrifice quality and safety to meet an unreasonably low time component bid to win the contract. Some practitioners recommend specifying a minimum B duration to avoid excessively low bids.
- Without factoring in the potential savings to road users, bid prices and other direct project costs may be higher for A+B projects when compared to conventional projects.
- Administrative and inspection costs may be higher as a result of accelerated schedules that increase demands on construction personnel (however, such costs may be offset by the shorter construction duration)

## B. A+B+I/D

### **Description**

A+B bidding and Incentive/ Disincentive is a new approach that combines these two contracting methods into one. The contractor is chosen based on the A + B total cost.

Incentive/disincentive is used to minimize the time that a facility may be affected by construction. The contractor is provided additional funds if the project is completed early, or is assessed damages if the project is not completed on time. Due to administrative concerns of implementing this concept, limit incentive/disincentive to a project that has one or more of the characteristics as follows:

1. high traffic volume occurs in an urban area;
2. it completes a gap in the highway facility;
3. it severely disrupts traffic or highway services;
4. it significantly increases road user's costs;

5. it significantly impacts adjacent neighborhoods or businesses;
6. it replaces a major bridge that is out of service; or
7. it includes lengthy detours.

The major differences between A+B and standard I/D contracts is that with Standard I/D provisions, INDOT determines the maximum duration to complete a project or project phase. When contractors prepare their bids, they check whether they can complete the work in the specified time frames, and bid the cost to complete within the specified time frame. Using A+B bidding, INDOT also determines the maximum duration to complete a project or project phase. However, when contractors prepare their bids, they determine the time it will take to complete the project or project phase. They balance the cost of the project and the cost of time to get the project.

***Determination of Incentive/Disincentive Amount:*** To be effective in accomplishing the objectives of I/D provisions, the I/D amount must be sufficient to encourage the contractor to develop innovative ideas, and ensure the profitability of meeting tight schedules. If the incentive payment is not sufficient to cover the contractor's extra costs, then there is no incentive to accelerate production, and the I/D provisions will not produce the intended results. As a general rule, the maximum number of days of incentive for each incentive period should be less than 30% of the number of days estimated by the Engineer rounded to the nearest whole day. The sum of all incentives for a single contract should be less than 5% of the Engineer's estimated contract amount. It should be noted that the 30% of time and 5% of budget are not meant to be the absolute limits to the incentive amounts. Engineering judgment may be used to allow some variations if it is more reasonable to use higher incentive amounts for some projects.

The current INDOT method for I/D amount determination in the Indiana Design Manual (INDOT, 2009) can be used to calculate the I/D amounts.

The Incentive amount must be included in the project budget.

When determining the maximum duration for the I/D time period, the Designer must consider to what extent, and at what cost, construction can be compressed from a normal

construction schedule. Normal construction time is generally based on a highly qualified contractor working five days a week, eight hours a day, while an accelerated time should be based on the performance of the same contractor working extended or extra shifts with additional workers for six or seven days a week. However, the use of a continuous seven-day workweek is cautioned against, because extended periods of work without days off may result in reduced efficiency and morale, and high turnover rates for both Contractor and inspection personnel. The maximum duration for I/D contracts should be based on an accelerated but achievable work schedule. If the completion date is impossible to meet, the contractor will not even try to earn the incentive. Unreasonable completion dates may discourage potential bidders from bidding. To accurately determine the I/D time period, Designers should develop a schedule, ideally using the critical path or some other quantitative method. This will ensure that the maximum duration specified is achievable, and that any other time related contract provisions are incorporated and consistent, i.e., utility schedule, railroad involvement, seasonal limitations, work restrictions, etc. The season of the year in which the project will be constructed should also be considered in determining the I/D time period.

### **Project Type Recommendation**

Similar to A+B and Incentive/Disincentive contracts.

#### Advantages

- Reduces contract time
- Minimizes time/cost impacts to traveling public for projects with high ADT and traffic impacts during construction
- Promotes innovative scheduling on projects that do not require all work to be completed sequentially
- Encourages contractors to maximize efficiency of crews and equipment
- Typically encourages greater coordination between the prime bidders and their subcontractors prior to bid to develop an achievable time component estimate

#### Disadvantages

- Potential for increased costs and delay claims due to utility and third party coordination problems or lack of timely agency reviews
- Contractors may sacrifice quality and safety to meet an unreasonably low time component bid to win the contract. Some practitioners recommend specifying a minimum B duration to avoid excessively low bids.
- Without factoring in the potential savings to road users, bid prices and other direct project costs may be higher for A+B projects when compared to conventional projects.
- Administrative and inspection costs

### Advantages

- Significant reduction in project time
- Encourages contractors to use time-saving means and methods to accelerate construction
- Minimizes cost and time impacts to the traveling public for projects having high ADT
- Shifts more risk to the contractor for providing the optimum combination of time, cost, and efficient planning and management of the work

### Disadvantages

- may be higher as a result of accelerated schedules that increase demands on construction personnel (however, such costs may be offset by the shorter construction duration)
- Higher bid costs and project costs
- Acceleration may over-extend agency and contractor personnel (however, the associated costs may be offset by the overall shorter construction duration).
- Acceleration could compromise project quality. However, I/D projects may also motivate contractors to perform work correctly the first time to avoid time-consuming rework efforts.
- The agency bears the risk of accurately estimating the critical I/D time and not delaying the I/D date. Agencies have reported that contractors may complete the I/D work and earn an incentive without expending extra effort and that contractors have earned incentives even when the project has been delayed.
- Agencies have reported that disincentive payments are difficult to recover.

## C. Design Build

### **Description**

INDOT has used Design-Build on several projects resulting in good experience with this approach. The Special Projects section, under the direction of Walter Land, have developed the INDOT approach and administered it.

A JTRP project, SPR-2497 “An Initial Evaluation of the Design-Build Highway Projects performed by INDOT,” did an evaluation of the INDOT Design Build approach and produced a report in September, 2002. A copy of this report can be obtained on-line through the link [http://rebar.ecn.purdue.edu/JTRP\\_Completed\\_Project\\_Documents/SPR\\_2497/FinalReport/spr\\_2497\\_Form1700.pdf](http://rebar.ecn.purdue.edu/JTRP_Completed_Project_Documents/SPR_2497/FinalReport/spr_2497_Form1700.pdf). This report describes how INDOT has used this contract delivery method on a few projects with mixed responses from those involved in the process. INDOT therefore felt that an evaluation of the Design-Build program was appropriate to determine its future use in Indiana. This report gives a historical perspective of Design-Build and how the program has been received and perceived by INDOT; describes the project’s survey and the data collected from the designer and contractor perspectives; relates the experiences of other Departments of Transportation with Design-Build; provides a somewhat limited comparison with the Design-Bid-Build approach; and makes recommendations for INDOT’s future Design-Build practices.

Results from projects completed and with information from other state DOTs, it is obvious that there is a place for Design-Build in INDOT when the right conditions exist. When a shortened project delivery time is needed, deadlines are demanding, or an emergency situation arises, Design-Build can be a preferred method.

### **Characteristics**

#### Time Savings

Compared to traditional contract procurement, time is saved when the project construction begins during the design level services. Design-Build assigns the design and construction to a single party, allowing some construction work to begin before the final design is completed.

#### Accountability

Design-Build provides singular accountability (single point of contact for project design quality, cost, and schedule from contract letting through construction).

#### Errors & Omissions

Design-Build reduces or eliminates change orders and claims due to "errors and omissions."

### Innovative

Design-Build allows the Contractor flexibility in the selection of innovative designs, materials, and construction techniques.

### Expertise

Design-Build may provide expertise not available in-house (Example- Intelligent Transportation Systems).

## **Selection Criteria**

1. If design is on the project's schedule critical path.
2. The project has a clearly defined scope, design basis, and performance requirements. The scope should clearly define not only what work is required, but also what work is not required.
3. There is a high degree of certainty that any complications involving utility conflicts, right-of-way acquisition, hazardous materials, wetland and environmental concerns, or other unresolved issues can be resolved within the contract budget and schedule.
4. The project is an emergency project or a project with tight time constraints.
5. The project involves a significant design effort with the potential to save time and money in the design phase.
6. The project requires expertise or capacity not available in-house.
7. The project has room for innovation in the design and construction efforts.

## **Project Type Recommendations**

- Medium to large projects that are more complex in nature and that can derive benefit from innovation in design or construction
- Projects having a high sense of urgency (due to natural disaster, facility failures, or user impacts) that would benefit from an expedited project delivery
- Road widening or new construction
- Road rehabilitation or reconstruction
- Bridge and tunnel projects

### Advantages

- Single point responsibility for design and construction
- Accelerated project delivery by:
  - Fast-tracking design and

### Disadvantages

- Reduced opportunities for smaller, local construction firms
- Fewer competitors and increased risk may result in higher initial costs

### Advantages

- construction
- Close coordination between designer and contractor
- Early contractor involvement to enhance constructability of plans
- Cost containment by minimizing owner's exposure to design errors and omissions
- Earlier schedule and cost certainty
- Innovation and quality improvements through:
  - Alternative designs and construction methods suited to the contractor's capabilities
  - Flexibility in the selection of design, materials, and construction methods

### Disadvantages

- Elimination of traditional checks and balances. Designer is no longer agency's advocate. Quality may be subordinated by cost or schedule considerations.
- Less agency control over final design
- Higher procurement costs
- Traditional funding may not support fast-tracking construction or may require accelerated cash flow.
- Accelerated construction can potentially overextend the workforce.

## D. Hyperfix Approach

### **Description**

In 2003 the Indiana Department of Transportation executed an ambitious interstate reconstruction project in Indianapolis, named Hyperfix. This project completely closed the I-65/70 section during reconstruction, on which approximately 250,000 vehicles travel daily. Due to the scope and risk involved, an extensive amount of planning, coordination, and cooperation occurred. The main section was rebuilt during the total closure phase, which lasted 55 days.

Hyperfix did impact the Indianapolis area. The biggest impact was in traffic flow and the shift in traffic volume to local streets and volume added to I-465. Local businesses were only minimally affected. In terms of travel time savings, the full closure option of Hyperfix turned out to be highly cost-effective. This project success can be attributed to many factors but the main ones are: a local and area road network with extra capacity, cooperation between various government agencies, a well prepared and executed public relations campaign, and comprehensive, careful advance planning.

Also a substantial incentive/disincentive clause encouraged contractor performance.

## **Engineering Issues**

A number of engineering issues emerged during the course of Hyperfix and should be considered in any future project of this type.

### **1. Night Operations**

It is necessary to analyze project activities to determine if a project would benefit from night operations. Safety and quality should be assessed in comparison with time savings.

### **2. Contractor Risk Factors**

Contractor risk factors should be identified and analyzed in order to determine how to package the project that encourages potential bidders to respond.

### **3. Total Closure Option Analysis**

Closure should be analyzed by the consultant and come as a recommendation from the consultant. A detailed analysis needs to be performed before a total closure is chosen. That should be a part of the scoping report. A major component of the scoping should involve a detailed travel impact analysis under various possible options. A review of metropolitan travel model results used by the INDOT and the City of Indianapolis in making closure decisions indicated lack of sensitivity to network changes. Greater effort should be made to determine if the model is capable of such sensitivity.

### **4. Analysis of Alternate Routes**

A careful analysis of alternate routes can result only from the use of a well organized metropolitan travel demand modeling process. Alternate routes should not have restrictions during total closure. Also, the modeling process should be able to investigate the impact of various options of freeway traffic management on the quality of traffic flow on local roads.

### **5. Local Ordinances**

Some local areas can have restrictions regarding noise and other aspects of construction activities, particularly local ordinances and their impact on construction activities should be identified during the planning process. These recommendations would provide guidelines to evaluate a total closure option. A well planned, timely evaluation is necessary for any organization considering the option taken in Hyperfix.

A JTRP project, SPR-2890 “An Evaluation of INDOT Hyperfix,” did an evaluation of the Hyperfix approach and produced a report in September, 2004. A copy of the report is available online at:

[http://rebar.ecn.purdue.edu/JTRP\\_Completed\\_Project\\_Documents/SPR\\_2890/FinalReport/spr\\_2890\\_form1700.pdf](http://rebar.ecn.purdue.edu/JTRP_Completed_Project_Documents/SPR_2890/FinalReport/spr_2890_form1700.pdf)

### **Project Type Recommendations**

- Very accelerated construction time required.
- No site restrictions for contractor.
- Road network can absorb traffic rerouting from closure
- Alternate forms of transportation available.
- All the stars are in alignment.

#### **Advantages**

- No traffic management required.
- Contractor has no site restrictions on his activities.
- Contractor innovation

#### **Disadvantages**

- Can result in higher bids if contractors plan on applying more resources or accelerating work
- Extra effort by the agency to monitor contractor activities
- Fast paced construction may be difficult to track and monitor
- When problems arise they must be resolved quickly
- Quality may suffer to speed

## **E. Incentive/ Disincentive**

### **Description**

Incentive/ disincentive (I/D) provisions for early completion are intended to motivate the contractor to complete the work on or ahead of schedule. It allows a contracting agency to compensate a contractor a certain amount of money for each day identified that critical work is completed ahead of schedule and assess a deduction for each day the contractor overruns the I/D time. The contracting agency specifies the time required for critical work and uses this provision for those critical projects where traffic inconvenience and delays are to be held to a minimum. The I/D amounts are based upon estimates of such items as traffic safety, traffic maintenance and road user delay costs. Florida has utilized a variation of the incentive/ disincentive provision that provides a variable I/D amount relative to the time of early or late completion. For example, a larger incentive is provided for a ten-day early completion than for a one-day early completion.

In February 2000, Michigan DOT (MDOT) completed an evaluation of the use of I/D clauses on 26 projects let and completed in 1998 and 1999. MDOT reported that 65% of I/D projects were completed early, 12% were completed on time and 23% were completed late. MDOT found that the average net reduction in contract days was 19% in comparison with similar projects that were let with an expedited schedule clause requiring the contractor to work a six-calendar-day week but without the use of an I/D provision. The average I/D rate for those 26 projects was \$18,500.00 and the average user daily savings was \$610,500.00. MDOT indicated that I/D provisions will result in an average expenditure of 1.5% of the contract amount.

With any incentive contract, the maximum possible incentive amount must be included in the project budget.

### **Project Type Recommendation**

- Projects requiring traffic restrictions, lane closures, or detours that would otherwise result in high user impacts (e.g., construction on major roadway, bridge, or interchanges having a high ADT; projects involving temporary lane, ramp, or bridge closures; emergency repair work).
- The project is relatively free of third party coordination concerns (e.g., utility, railroad, environmental issues, public opposition) that could affect the bid letting date or the project schedule.
- The I/D amount results in a favorable cost/benefit ratio to the traveling public (i.e., the benefit to the highway user exceeds the I/D amount, and this amount is high enough to motivate a contractor to accelerate).
- The agency has the ability to estimate the I/D time based on expedited production rates for similar work, historical records, or CPM scheduling.

#### **Advantages**

- Significant reduction in project time
- Encourages contractors to use time-saving means and methods to accelerate construction
- Minimizes cost and time impacts to the traveling public for projects having high ADT
- Shifts more risk to the contractor for

#### **Disadvantages**

- Higher bid costs and project costs
- Acceleration may over-extend agency and contractor personnel (however, the associated costs may be offset by the overall shorter construction duration).
- Acceleration could compromise project quality. However, I/D projects may also motivate contractors to perform work correctly the first time

### Advantages

providing the optimum combination of time, cost, and efficient planning and management of the work

### Disadvantages

to avoid time-consuming rework efforts.

- The agency bears the risk of accurately estimating the critical I/D time and not delaying the I/D date. Agencies have reported that contractors may complete the I/D work and earn an incentive without expending extra effort and that contractors have earned incentives even when the project has been delayed.
- Agencies have reported that disincentive payments are difficult to recover.

## F. Warranties

### **Description**

Warranties are used to guarantee the integrity of a product and the contractor's responsibility to repair or replace defects for a defined period. Two general types of warranties are common in highway construction: material and workmanship warranties and performance warranties.

Material and workmanship warranties hold contractors responsible for correcting short-term problems that result from defective materials and workmanship, but not from those associated with design.

With performance warranties, the contractor guarantees that the work will perform at the desired quality level during a longer-term warranty period (5 to 10 years), with quality measured by actual performance as opposed to material properties and methods of construction. For pavements, more responsibility for mix design shifts to the contractor, as innovative designs or techniques are used to ensure performance throughout a long-term warranty period.

### *Performance Outcomes*

State DOTs have used warranties for asphalt concrete and portland cement concrete with varying degrees of success. Some states that use pavement warranties have reported a reduction in costs and an improvement in quality, while others have not. For example, the Wisconsin DOT has reported significant quality increases and overall internal cost reductions through the use of 5-year performance warranties for asphalt concrete

pavements. However, an evaluation of 3-year workmanship and materials warranties completed by the Colorado DOT showed no discernible impact on quality or cost.

Michigan has been using 3- to 5-year warranties for approximately ten years. Although Michigan has not formally evaluated quality data, they report that contractors appear to pay more attention to quality issues during construction as a result of warranty provisions. Michigan has also reported that small and medium sized firms are not bidding on warranty projects. In contrast, INDOT, which has been using HMA warranties for the past ten years and PCC warranties for the past 5, received industry buy-in before letting its first warranty project and has not seen a reduction in open competition. Warranty periods for asphalt and PCC pavements are five years. For microsurfacing the warranty period is three years.

INDOT has reported the following performance results based on 15 projects constructed:

- Warranty HMA has a lower and more consistent IRI than non-warranty HMA. The mean value of the warranty projects is not only significantly lower, but the standard deviation is also significantly lower.
- Warranted HMA sections have less rutting than non-warranty sections. Also, rut depths are less variable.
- Performance of the HMA warranty projects exceeds that of the non-warranted projects
- Using warranted HMA as a pavement construction strategy requires less demand on budget and provides a smoother pavement (lower IRI).
- Predicted 25-year cost to maintain network smoothness at a constant 2002 value is \$1.08 Billion dollars using a warranty strategy, and \$1.47 Billion dollars using a non-warranty.
- Initial capital costs for HMA warranty projects are approximately 10 percent higher than for non-warranty projects.
- Use of warranties for HMA projects as a pavement preservation strategy can produce a cost savings of 27 percent.

### **Project Type Recommendations**

- Projects for which there is a low risk that external factors not within the control of the contractor will affect warranted work
- Projects for which measurable performance criteria can be developed

Warranties have been used for HMA and PCC rehabilitation, HMA overlays, pavement surface treatments, bridge painting, deck joints, pavement markings, ITS components, and others.

### Advantages

- Potential to increase quality, lower life-cycle costs, and reduce premature failures
- May result in less testing and inspection by agency personnel during construction
- Raises awareness on how material and workmanship decisions can affect long-term performance

### Disadvantages

- Potential for higher initial cost
- Agency staff must monitor performance during the warranty period
- External factors, such as preexisting conditions or inaccurate traffic prediction, may affect quality
- Difficult to link measurable quality attributes to long-term performance
- Warranty period may be insufficient to detect deficiencies caused by poor material or workmanship
- Contractors have expressed concerns that warranty projects will tie up funds and reduce bonding capacity for extended durations

## G. Work Day with No Excuse Completion Date Contracts

### **Description**

A Work Day with No Excuse Completion Date Contract sets the number of Work Days to complete a project or portion of a project. The Contractor must complete the project within the allotted number of Work Days, but in no case later than the specified Completion Date. The start date may be delayed by mutual agreement between the Department and the Contractor to allow flexibility in the prosecution and administration of the Contract. Work Day charges will begin on the date mutually agreed upon. Regardless of the number of Work Days allowed and the agreed upon start date, the Contractor must still complete the work by the Completion Date. Work Days are determined weekly to eliminate disputes. (CPM scheduling is a requirement for Work Day Contracts.)

### **Objectives**

#### Contract Administration

A Work Day with No Excuse Completion Date Contract allows the Department and the Contractor to more efficiently administer and prosecute the project by determining when the project begins and the number of days until completion. This method demands a great deal of knowledge about the construction of a project.

## Time Savings

Work Day with No Excuse Completion Date Contracts set the number of days to complete the project along with an absolute completion date. This method can reduce or eliminate the project down time by specifying the number of days to complete the job. It will not save construction time, just better define the construction time.

## Criteria for Selection

1. The project construction time must be known in order to determine the project Work Days.
2. The project should be free from time delay issues such as utility conflicts, right-of-way acquisition or other unresolved issues.
3. The project must be one that has a defined benefit date but flexibility of when work may be performed during a construction season.

## **Project Type Recommendation**

1. Small to Mid-Size Projects - Projects for which a definite number of Work Days can be determined. (Supply and delivery issues must be considered in determining the number of Work Days.)
  - a. Benefits: Better utilize construction staff.  
Knowledge of construction time and activities.
2. Mega Projects - Currently the Department is not prepared to sell large projects by Work Day Contracts. A more appropriate application may be used in the completion of a portion of a larger project.

## APPENDIX

Table 1  
Innovative Contracting Comparison Table

Project Objectives, Types, and Selection Criteria	A + B Bidding	A+B+I/D	Design Build	Hyperfix	Incentive/Disincentive	Warranties	Work Day Contracts ?
<b><i>Project Objectives</i></b>							
Accelerate Delivery	x	x	x	x	x		
Reduce Procurement Time				x	x		
Promote Innovation			x	x	x	x	
Enhance Quality/ Performance			x			x	
Early Cost Certainty			x				
Staffing Considerations			x	x			x
Single Point of Responsibility			x				
Reduce Construction Cost	x	x					x
Reduce Life-Cycle Cost						x	
Minimize road user impacts	x	x		x			x
Minimize disputes			x				
<b><i>Project Types/ Selection Criteria</i></b>							
Small to medium size jobs						x	x
Large Project with multiple phases			x				
Emergency project			x				x
Repetitive/ well-defined work item							
Time sensitive project	x	x	x	x			
Local Community/ political interests				x			
Flexible traffic management							
High Traffic Volumes/ high RUC	x	x					
Specialized resources or expertise required			x	x			
Significant risks or unknowns remain							
Performance criteria can be developed						x	
Well-defined project conditions with minimal third party conflict	x	x	x				x

Source: Trauner Consulting Services

## A+B Special Provision

### DESCRIPTION

The A + B process for bidding will take into account not only the unit prices of the bidder, but also the time within which the Contractor proposes to complete the work.

### PREPARATION OF PROPOSAL

The contractor shall establish the number of ramp closure periods, for the State Road 267 and State Road 334 ramp closure days that they will require to complete the work in accordance with the plans and specifications. The number of days and periods proposed by the Contractor shall be entered in the Itemized proposal. The product of this number of days times the average daily road benefit shall be calculated as follows:

#### State Road 267

I-65 Northbound Exit Ramp Closure Days  
= (XX days) X (\$5,000.00/day)  
= \$ \_\_\_\_\_

I-65 Northbound Entrance Ramp Closure Days  
=(XX days) X (\$5,000.00/day)  
=\$ \_\_\_\_\_

I-65 Southbound Exit Ramp Closure Days  
=(XX days) X (\$5,000.00/day)  
=\$ \_\_\_\_\_

I-65 Southbound Entrance Ramp Closure Days  
= (XX days) X (\$5,000.00/day)  
=\$ \_\_\_\_\_

#### State Road 334

I-65 Northbound Exit Ramp Closure Days  
= (XX days) X (\$15,000.00/day)  
= \$ \_\_\_\_\_

I-65 Northbound Entrance Ramp Closure Days  
=(XX days) X (\$10,000.00/day)  
=\$ \_\_\_\_\_

I-65 Southbound Exit Ramp Closure Days  
=(XX days) X (\$10,000.00/day)  
=\$ \_\_\_\_\_

I-65 Southbound Entrance Ramp Closure Days  
= (XX days) X (\$15,000.00/day)  
=\$ \_\_\_\_\_

The sum of these amounts will be added to the Contractors total of Unit bid prices and will be used for comparison of bids in establishing the Successful bidder.

**CONTRACT TIME**

Within the contract, time is defined as follows:

Closure Day: The number of calendar days allowed for the closure of the ramp. Any portion of a day will be assessed as a day. The Department will be the sole approving authority in determining when days are charged for Ramp Closures.

The total number of Ramp Closure Days for each ramp is set as follows:

State Road 267 ramps: 21 days per ramp

State Road 334 ramps: 7 days per ramp

The Contractor may provide multiple crews, multiple shifts or work overtime to complete the contract.

Extensions of Ramp Closure Days for additional work or extra work will only be considered for the time the work actually affects the controlling operation of the contract. The applicable requirements of Section 108.08 apply except time extensions will not be considered due to above normal rainfall. Failure to Complete on Time, section 108.09, will not apply to the contract time defined above.

**CONSIDERATION OF BIDS**

The bid to be submitted by the Contractor shall consist of two parts:

A - The total dollar amount for all work to be performed under this contract.

B - The total dollar amount for ramp closure days as proposed by the contractor to complete the referenced work.

The successful bid will be determined by the Department as the lowest combination of A + B according to the formula:

$$A + B = \text{Total Bid}$$

The formula will only be used to determine the successful bidder. It will not be used to determine payments to the Contractor.

**INCENTIVE/DISINCENTIVES**

The Contractor shall be liable for any increase in the total value for Ramp Closure Days when compared to the number of days bid. Conversely, the Contractor shall be eligible to earn an incentive for a reduction in the total value for Ramp Closure Days when compared to number of days/periods bid. The maximum incentive shall not exceed \$770,000.00.

**BONDS**

The Contractor s Performance Bond shall apply to Part A of the Contractor s bid.