

**PRIMER ON CONTRACTING**  
**For the Twenty-first Century**  
**Fifth Edition**  
**2006**



*A Report of the  
Contract Administration Section of the  
AASHTO Subcommittee on Construction*

*Chairman:* Cal Gendreau, North Dakota DOT

*Vice Chairman:* Jeff Benefield, Alabama DOT

*Secretary:* Jerry Yakowenko, FHWA

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## PREFACE

The 2006 version of the “Primer on Construction Contracting for the 21<sup>st</sup> Century” is an updated version of the *1997 Primer on Contracting 2000*, which was initially written by the Contract Administration Section of the AASHTO Subcommittee on Construction. It is not considered to be an official AASHTO guide or voluntary standard.

This document lists various project delivery methods, procurement methods, payment methods, contracting techniques and contract administration procedures that are currently being used by various contracting agencies in their transportation programs. Neither AASHTO nor FHWA fully supports all of the techniques that are identified in this document. Some of the techniques are not appropriate for all contracting agencies and they should be used only where applicable. The contracting agencies should consult with their counsel to verify the legal sufficiency of using these techniques. Also, it is extremely important to coordinate with the highway industry in the development of any new contracting technique. Early industry involvement will facilitate the implementation and acceptance of techniques that have not been used in the past.

The Subcommittee on Construction welcomes comments on this Subcommittee Report and will consider all that are received. It is anticipated that comments on this report will be considered for incorporation in future editions of this report.

Comments on this report should be sent directly to the Secretary for the Contract Administration Section, AASHTO Subcommittee for Construction at the address displayed below.

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## Introduction

At the 1996 meeting of the AASHTO Subcommittee on Construction, Chairman Don Lucas (Indiana DOT), issued a challenge to the Subcommittee members. He asked them to consider what contracting practices should be available in the year 2000 and to identify institutional obstacles to innovation. Mr. Lucas stated that contracting agencies must be allowed to include quality factors in the procurement process to a greater degree than under our current system of procurement. During the Subcommittee's Task Force on Contract Administration's breakout session, various viewpoints on Contracting 2000 were identified. The following is a "White paper" that summarizes the opinions and views of the members of the AASHTO Subcommittee on Construction-Contract Administration Task Force.

The traditional competitive bidding system has served the public well over the past century. The foundation of this system is the principle of competitive sealed bids with award to the lowest responsive bidder who meets specific conditions of responsibility. Over the decades, this procurement system has provided taxpayers with an adequate, safe and efficient transportation facility at the lowest price that responsible, competitive bidders can offer. For the most part, it has effectively prevented favoritism in spending public funds while stimulating competition in the private sector.

While the low bid system has served the public well, it has not always optimized the overall quality of the final product and it is not necessarily the most efficient way to procure services for all types of highway contracts. State transportation administrators are sometimes subject to various political forces. Some states have gone through severe downsizing due to budget constraints. Others are under increased pressure to move critical projects quickly from the planning stage, through design and into construction. Deteriorating infrastructure is prompting public demand to "fix the problem yesterday; however, don't raise taxes." Underlying these external pressures is the basic requirement to include quality concepts in all phases of the highway program. Thus, there is a continuing need to review and evaluate any contracting procedure.

### *Past Efforts to Incorporate Quality in the Contracting Process*

#### **TRB Task Force A2T51**

In 1987, the Transportation Research Board (TRB) established a Task Force on Innovative Contracting Practices (A2T51). This task force was created for the purpose of identifying promising innovative contracting practices for further evaluation. The task force addressed four major topic areas: bidding procedures, materials control, quality considerations and insurance and surety issues. In evaluating each of these areas, the task force considered the following:

- 1) Procedures and specifications that stifle initiative and innovations as well as those that encourage them;
- 2) Ways that current procedures and specifications adversely affect quality or unfairly assign risk;
- 3) Various types of performance-based quality assurance specifications that have been demonstrated to improve quality and equitably assign risk;
- 4) Effects of penalties and incentives;
- 5) Alternative methods of contract award that have been used successfully; and
- 6) Administrative, legal and other problems.

In December 1991, TRB published the final recommendations of Task Force A2T51 in a benchmark document entitled *Transportation Research Circular Number 386: Innovative Contracting Practices*. This report listed a number of short-term and long-term actions for each of the four major topic areas.

#### **FHWA's Special Experimental Project No. 14 (SEP-14) - Innovative Contracting**

While the TRB Task Force A2T51 was formulating its recommendations, the Task Force Chairman, Dwight Bower, subsequently requested that FHWA establish a project to provide a means to evaluate some of the task force's more project-specific recommendations, and SEP-14 was initiated on February 13, 1990. Since the initiation of SEP-14 in 1990, FHWA has approved the use of many innovative contracting practices for evaluation. Four of the original major innovative contracting practices (A+B bidding, lane rental, warranties and design-build ) are no longer considered to be experimental in nature, and states may now use these techniques without FHWA Headquarters approval on Federal-aid projects.

Today SEP-14 continues to be available for the use and evaluation of promising alternative contracting techniques. In October 2004, the FHWA initiated SEP-15, an experimental program to allow contracting agencies to explore alternative and innovative approaches to the overall project development process, such as public-private partnerships. See the FHWA's [Public-Private Partnerships web site](#) for additional information regarding SEP-15 and public-private partnerships.

## **The National Quality Initiative**

As a result of the National Quality Initiative (now known as the National Partnership for Highway Quality), many states developed and are evaluating quality assurance specifications and materials control procedures. The AASHTO Subcommittee on Construction and others have developed guide specifications for quality assurance procedures; however, much work remains to be done to fully implement quality assurance specifications within the highway industry.

## **Contracting for the 21<sup>st</sup> Century**

In order to utilize and build upon previous efforts to implement quality concepts in the highway industry, the AASHTO Subcommittee on Construction and FHWA have developed a catalogue of contracting methods and procedures that will be used in the future. FHWA will coordinate and disseminate information regarding alternative contracting procedures, and the AASHTO states will provide the evaluations and recommendations concerning these contracting methods.

Through this joint AASHTO/FHWA relationship, the states will have a convenient documentation source for contracting information. "What's working? What's not? Who has used it?" are typical questions to be addressed. In addition, FHWA will serve as a resource in coordinating research, training, educational efforts and other program related issues. Similarly, AASHTO will provide program direction through its unique ability to provide input and consensus on highway industry issues.

In August 1996, Chairman Don Lucas challenged the Subcommittee to consider what contracting practices should be available in the year 2000. Contract Administration Task Force Chairman Len Sanderson led a group discussion on this subject at the Contract Administration Task Force Meeting in August 1996. The following is a list of topics that were offered for discussion:

- Performance-related specifications;
- Warranted products;
- Long-life products/end results;
- Buy quality;
- Incentive/disincentive;
- More surety/bonding company involvement in processing of warranty jobs;
- Use of variable or depreciating bonds on warranty jobs;
- Need to train technicians, construction superintendents, operating craftsmen and Engineers;
- Lump sum bidding;
- Certification programs that are transferable;
- Standard matrix selection based on traffic volumes (pavement type, loading, etc.);
- Design-build / warranty;
- Design-build maintain;
- Improved work zone to improve motorist safety and eliminate delay;
- Payment based on quality control;
- Pavement management;
- Industry-State DOT communication in project development;
- Changing contractor roles;
- New products (such as High Strength Concrete); and
- Minimum staff level needed to maintain transportation infrastructure.

Subsequent to the 1996 meeting, several discussions took place regarding the role and need for a Contracting 2000 White paper. The above list of topics was modified to a composite list as identified in the Table of Contents. This list is not all-inclusive but merely represents the non-traditional contracting techniques for which there is some experience base. It is believed that this paper will serve as a living document that will be kept up to date and serve as a current reference for those interested in the "state-of-the-practice" for various contracting techniques in the highway program.

## **What is a primer?**

Webster's dictionary defines a primer as an elementary textbook or a book covering the basic elements of a subject. That is the intent

of the “Primer on Contracting for the 21<sup>st</sup> Century”. It is not meant to serve as a detailed reference. It is only intended to provide very basic information on non-traditional contracting techniques. The Primer provides a description of the contracting technique, limited information regarding the use of these provisions, a list of contracting agencies that have some experience with the technique and a contact person for additional information.

# Contracting Techniques for the 21<sup>st</sup> Century

## Active Management Payment Mechanism

**Description:** The British Highways Agency has developed a contracting and payment technique call “Active Management Payment Mechanism” (AMPM) which they are evaluating on design-build-finance-operate contracts. The Highways Agency is moving towards a lane availability concept that provides contractors with an incentive to maximize the availability of open lanes. The British Highways Agency will measure the average speed through the workzone and the actual traffic flow. Incentives will be based on measured travel speed and the measured volumes in comparison with theoretical percentages of roadway capacity.

Arizona DOT implemented a variation of the AMPM concept on the State Route 68 design-build project. ADOT used a contractual provision that required the design-builder to measure speed consistency and performance through a 13-mile construction work zone. The contract provided for a \$400,000 travel time budget item that would be drawn against if the target travel time average was exceeded. Contractual incentives and disincentives were implemented for performance above or below the contractual standard.

The design-builder elected to deploy an electronic license plate reader system developed by the British company Computer Recognition Systems. This system used a camera and a light source to capture license plate images of passing vehicles. The license plate number was taken from the picture by image recognition software, encrypted then sent to the central computer at the contractor’s office through a high-speed data connection. A second camera at the end of the project, took a second picture, encrypted that license plate number and sent it to the central computer. The central computer correlated license plates numbers that entered and exited the limits of the construction project.

As a result of this provision, the design-builder was able to maintain traffic flow through the project during construction similar to the time it took to travel the project before construction began. The contractor was only charged \$14,857 against the \$400,000 and thus received 96 percent of the incentive amount at the end of the project.

**Owners:** British Highways Agency, Arizona DOT

**Contact:** Jennifer Livingston, Arizona DOT, 928-779-7591.

### References:

FHWA Report, [“Intelligent Transportation Systems in Work Zones. A Case Study. Work Zone Travel Time System.”](#) October 2004  
FHWA Report, [Contract Administration: Technology and Practice in Europe,](#)” October 2002 (see payment by availability)

## Alliancing (Target Pricing)

**Description:** Alliancing is a form of target pricing that was developed by British Petroleum in the early 1990’s. The alliance is formed by the owner, designer, construction contractor, and suppliers to deliver a specific project. The alliance takes collective responsibility for project delivery, collective ownership of all project risks and it shares in the risks and rewards of actual project performance. Some key features of an alliancing include:

- Target pricing with payments based on open book costs
- All parties share in risk and reward
- All parties win or all parties lose
- Open and honest relationships
- Litigation prohibited by contract

**Owners:** Since 1999, alliancing has been used on approximately 70 projects (35 of these were in Australia).

**Contact:** Mike Wilke, Chief Executive Officer, Parson Brinkerhoff Sydney, Australia,  
Email [brisbane@pb.com.au](mailto:brisbane@pb.com.au)

### References:

## Alternate Bids / Designs

**Description:** Some contracting agencies use alternate bidding procedures when more than one alternate is judged equal over the design life and there is a reasonable possibility that the least costly design approach will depend on competitive circumstances.

Alternate pavement type bidding The FHWA's traditional pavement policy discourages the use of alternate pavement type bidding. This is based on the fact that it is difficult, if not impossible, to develop truly equivalent alternate designs for Portland cement concrete pavement and asphaltic concrete pavements. However, the FHWA has allowed states to evaluate the use of alternate pavement type bidding with bid adjustments to account for differences in life-cycle-costs under SEP-14 – "Innovative Contracting." Several State DOTs, including Louisiana, Michigan, Kentucky, Alabama, Missouri and Maryland have experience with alternate pavement type bidding procedures. The Michigan DOT and the Louisiana DOT&D let projects which utilized life-cycle cost estimates in determining the successful lowest bidder. These State DOTs developed pavement typical sections and specifications that provide a level playing field for the bituminous and Portland cement paving industries. Louisiana utilizes alternate pavement bidding where the estimated difference in life-cycle-costs is less than 20%. See the Louisiana DOT&D's January 2004 Transportation Research Board report titled "[Agency Process for Alternate Design and Alternate Bid of Pavements.](#)"

Alternate structure type bidding From December 1979 to August 1995, FHWA had a policy that required the preparation of alternate designs for major structures. This resulted in increased competition and an estimated average savings of two million dollars per structure. However some contracting agencies believed that a requirement to prepare two full structural designs was burdensome, and in August 1995, the FHWA rescinded this policy. States may now use their own procedures for preparing designs for major structures.

In 1980, PennDOT instituted a policy of allowing optional alternate design submissions by contractors. PennDOT's alternate bridge design policy allows contractors to propose an alternate bridge design at the time of bid submission. The alternate design may include virtually any aspect of the bridge design including: a redesigned superstructure, substructure, span length, etc. The contractor may not change the clear span distances (horizontal/vertical clearances) or the horizontal/vertical alignments. The alternate design must be equivalent to the "as-designed" structure. An acceptable preliminary conceptual alternate bridge design must be approved within 30 calendar days of bid opening; otherwise, the contractor must build the "as-designed" structure at no additional cost. Value engineering may be applied to the "as-designed" structure. The contractor must pay for a portion of PennDOT's cost to review the alternate design (up to \$5,000). Program results indicate a cost savings of 10 percent for major structures and 7.2 percent for non-major structures.

Additive Alternate Bidding Some owners use a bidding technique called additive alternates when it is necessary to keep the awarded contract amount within budget. Under this procedure, the owner includes most of the project scope-of-work in "base-bid" items, and then specifies "additive alternates" which may be selected if the "base-plus-alternates" price is within budget. The owner must clearly specify the priority of alternates which will be considered and indicate that the award will be based on the lowest responsive bid considering the sum of the base bid and additive alternates which are within budget. The FHWA Federal Lands Highway Division and several other local public agencies have used this technique.

**Agencies:** MO, PA, LA, MI, FHWA FLHD

**Contact:** Kirk Zeringue, Louisiana DOT&D alternate pavement bidding, 225-379-1937; Steve Bower, Michigan DOT (517) 322-5198; Gary Sharp, KYTC, (502) 564-3280

## Alternative Dispute Resolution (ADR)

**Description:** The use of ADR techniques allows fair-minded people to resolve their differences in a manner that emphasizes reasonableness and fairness. The methods vary by the assistance from outside sources and the amount of decision taken away from the disputing parties. Traditional resolution methods include: negotiation, mediation, non-binding arbitration, arbitration and litigation. Non-traditional methods include: disputes review board, mini-trial and partnering.

For a current state of the practice regarding alternative dispute resolution, see the Wisconsin DOT Transportation Synthesis Report titled: "[Alternative Dispute Resolution.](#)"

**Disputes Review Board** This non-traditional method requires the creation of a standing committee of three persons which meets on a regular basis to review and resolve all project disputes before they become formal claims. Both parties choose a member who represents them and select the third “neutral” member. The operating procedures are described in the contract and both parties share the operating costs. The board renders written decisions; however, the decisions are typically non-binding upon the parties. This technique has been used in AK, CA, CO, DE, FL, HI, PA, ME, MA, ND and WA.

**Mini-Trial** Mini-Trials are more formal than mediation in that a dispute is treated as a business problem. Lawyers and experts present a summary of their “best case” to senior officials of the owner and the contractor. The senior officials settle the dispute with the aid of a neutral party.

**PennDOT Mini-Trial Procedures** Pennsylvania (PennDOT) used this method to settle a construction claim on the Schuylkill Expressway project. Each party was represented by a principal participant with the authority to settle the dispute on behalf of the party represented. The FHWA also had a representative at the mini-trial who had the authority to approve any settlement reached by the parties. A neutral advisor to be selected jointly by the parties chairs the mini-trial. The neutral advisor performs a mediation function, enforces time limitations, asks questions of witnesses, and if necessary, issues an advisory opinion on the merits of the dispute. The presentations at the mini-trial are informal with the rules and procedures stated in the agreement. The mini-trial is conducted within a specific time frame.

**Partnering** Partnering is not truly an ADR method, but merely a change in the attitude and the relationship between owner and contractor. It often results in a relationship between the owner and contractor that promotes achievement of mutual and beneficial goals. For this reason, many State DOTs have promoted the partnering concept to reduce claims and expedite projects. A January 1995 AASHTO Subcommittee on Construction survey found that:

- 46 out of 50 states utilize partnering;
- Partnering has resulted in favorable results in reducing claims. (34-yes, 1-no, 11-undecided);
- 19 out of 50 states used a Dispute Review Panel. (19-yes, 31-No); and
- A panel has been successful in resolving disputes. (14-yes, 0-no, 5-undecided).

**Agencies:** See above.

**Contact:** Jerry Yakowenko, FHWA, (202) 366-1562 for general information

## **Bid Averaging**

**Description:** Florida DOT is evaluating this technique on a few state-funded highway projects. In general, FDOT averages the bids and awards the contract to the bidder closest to the numerical average. The theory behind this technique is that the contractors are encouraged to submit reasonable bids for work. Theoretically, unreasonably low bids are eliminated, and a contractor with a reasonable bid is selected. FHWA did not approve this concept under SEP-14 as it did not fit within the legal framework of 23 U.S.C. 112. For specific implementation procedures, see the Florida DOT document titled: “[Alternative Contracting, Bid Averaging Method.](#)”

**Agencies:** Florida DOT

**Contact:** Ken Leuderalbert, Florida DOT, 850-414-4383

## **Certified Producer Programs**

**Description:** Indiana has a program to certify aggregate and hot mix asphalt producers. The Indiana Certified Aggregate Producer Program is a program in which a qualified mineral aggregate producer desiring to supply material to INDOT shall do so by assuming all of the plant site controls and a portion of the testing responsibility that had been previously assumed by INDOT. The program focused on production testing by the producer and a site specific Quality Control Plan that indicates how the producer proposes to control the materials at the plant. Benefits of the program to the producer include improved aggregate uniformity.

The Indiana Certified Hot Mix Asphalt Producer Program is a program in which the producer takes responsibility for all aspects of the

production of quality hot mix asphalt in accordance with contract requirements and the department monitors the producer's production, sampling and testing procedures. The Certified HMA Producers Program is now a requirement for all QC/QA projects. The contractor may substitute a QC/QA mix from a Certified Plant on some Non-QC/QA mixes. Acceptance of the materials is based on a certification from the plant with no further testing by the Department.

**Agencies:** Indiana DOT

**Contact:** Dennis A. Kuchler, Indiana DOT, (317) 232-5502

## Constructability Reviews

**Description:** For a current state of the practice, see the Wisconsin DOT Transportation Synthesis Report titled: "[Constructability Reviews](#)."

AASHTO's 1998-1999 Strategic Plan Item #5-4 states the following: "Identify and advocate cost savings associated with constructability reviews between designers and construction personnel and encourage participation by contractors and suppliers during design." In 1999, the AASHTO Subcommittee on Construction conducted a survey of the current use of constructability reviews in the US. With a 90% response rate from the states, the survey revealed the following (See Steve DeWitt, NCDOT for details):

- 74% of all respondents had a constructability review process.
- 15% of constructability reviews are performed at the 15% design complete status, 23% at the 60% complete stage, 27% at the 95% complete stage and 35% at other stages.
- 59% of respondents consider all projects as candidates for constructability reviews.
- 88% of respondents did not have a method of quantifying the benefits of constructability reviews.
- Reported benefits include: fewer change orders, better plans, fewer claims, reduced contract time, safer designs, education, higher quality, reduced impacts to motorists, better understanding of project by construction personnel prior to construction.
- 59% of the respondents perform post-construction reviews.

**Recent Research:** "[Cost/Benefits of Constructability Reviews](#)" (note: 11 MB file) – The Subcommittee initiated an NCHRP Project (20-7, Task 124) to examine the cost effectiveness of constructability reviews.

In 1998, The Texas Transportation Institute completed NCHRP Project 10-42, *Constructability Review Process for Transportation Facility*. The objective of this research study was to develop a methodology for a constructability review process for application by transportation agencies. The research identified concepts, evaluated the application of existing analytical tools, and provided implementation procedures for tailoring this methodology to individual transportation agencies.

**Contact:** Dr. Stuart Anderson, TTI, 409-845-2407, Dr. Donn Hancher, University of Kentucky 606-257-4857, Steve DeWitt, NCDOT, (919) 733-2210; Assistant Professor Philip Dunston, U. of Washington, (206)685.1795;

**Agencies:** NC, CA, CT, DE, WA

## Construction Manager At Risk

**Description:** The vertical building industry has been using a contracting technique called construction-manager-at-risk for many years. Under this procedure, an owner selects a design and construction management consultant on the basis of qualifications, experience, fees for management services and prices for the target cost of construction as well as an estimated ceiling price. The consultant then proceeds with the preliminary design. At some point in the design process (typically at the 60-90% design completion), the owner and the consultant will agree on a guaranteed maximum price for the construction of the project. Many owners favor this contracting technique as it gives them greater control of the design process, yet it still provides for innovation and constructability recommendations in the design phase.

The Florida DOT is evaluating the [construction manager at risk technique](#) on a program basis as well as on the \$1.349 billion [Miami Intermodal Center](#), a large parking garage / transit / roadway project in Miami.

**Agencies:** Other contracting agencies that have some experience with the construction manager at risk delivery system include: the City of Phoenix, Arizona (several intelligent transportation projects), Detroit Wayne County Port Authority (ferry terminal), Pinellas County, Florida (roadway project) and the Washington State Ferries (for the use of the General Contractor / Construction Manager project delivery method for the Anacortes Ferry Terminal Building).

**Contact:** Ken Leuderalbert, Florida DOT, 850-414-4383; Robert R. Steele, ITS Manager - City of Phoenix Street Transportation Department, 602-495-0238.

## Contract Maintenance

**Description:** Contract maintenance means the use of private sector forces to perform maintenance services that were previously done by the owner. This may include both routine or preventive maintenance activities. Contracting agencies may use ‘means and methods’ type contracts or ‘performance-based’ contracts. For “means and methods” contracts, the contracting agency specifies the materials and methods that must be used to satisfactorily complete the work. The contractor has little incentive to provide innovation in performing the contract work. Under performance-based contracts, much of the risk for the maintenance of certain assets is transferred from the agency to the contractor in accordance with level-of-service requirements outlined in the contract documents. Virginia and Florida are two states that have been leaders in this type of contracting. Using these two contracting approaches, it is estimated that as of 1999 approximately \$2.5 billion in maintenance work was contracted out to the private sector.

In 1997, the Virginia DOT entered into a \$131.6 million, five-year contract with VMS Inc. in a pilot project to provide turnkey maintenance services for a total of 250 miles on portions of I-95, I-81, I-77 and I-381. The services provided include all routine maintenance such as mowing roadsides, painting pavement markings, snow removal and operations up to and including major rehabilitation and restoration work. The agreement required that VMS provide maintenance services that are equal to or better than the maintenance services that VDOT historically provides. In 1996, VDOT estimated potential savings of \$23 million, however, subsequent reviews question the actual savings achieved.

In 2000, the Florida DOT signed a \$73.5 million performance-based asset management type contract for all maintenance activities on 274 miles of I-75 for a 7-year period. As of September 2004, the Florida DOT had 17 maintenance contracts with four different companies to maintain various features throughout the state. By 2008, FDOT plans to have about 30 maintenance contracts worth an estimated \$ 1 billion.

In August 2000, the D.C. Department of Public Works entered into a \$69 million, 5-year contract with VMS Inc. to provide all maintenance services on the National Highway System in the District. This contract uses many performance measures to evaluate the contractor’s performance.

**Recent reports:** For a current summary of the state of the practice related to contract maintenance issues, see the Wisconsin DOT Transportation Synthesis Report titled: “[Contract Maintenance](#).” AASHTO’s August 2002, “[A Guide for Methods and Procedures in Contract Maintenance](#)” provides guidelines for procuring and administering maintenance contracts.

Various reports have provided differing opinions regarding the cost-effectiveness of contract maintenance. For additional information, see:

[A Synopsis of WSDOT’s Review of Highway Maintenance Outsourcing Experience Contracting for Road and Highway Maintenance](#), February 2003, Reason Foundation  
NCHRP Synthesis #313, [State DOT Outsourcing and Private-Sector Utilization](#), March 2003

**Contact:** Jim Sorenson, FHWA, (202) 366-1333 for general contract maintenance information.

## Contractor Quality Control Test Results in the Acceptance Decision

**Description:** A few states are currently evaluating the concept of utilizing contractor quality control test results (to varying degrees) as part of the Agency’s acceptance determination.

On Federally funded projects, FHWA’s regulations for Quality Assurance Procedures for Construction (Title 23 CFR 637 B) prescribe

FHWA policy. Contractor quality control testing results may be used in an Agency's acceptance determination provided that such testing is random and is validated by acceptance or verification testing by the Agency. Acceptance or verification testing is still performed by the Agency, usually at some lesser frequency. This position is also supported by AASHTO and documented in AASHTO's February 1996 Implementation Manual for Quality Assurance. The verification sampling and testing are to be performed by qualified testing personnel employed by the Agency or its designated agent (excluding the contractor). On August 9, 2004, the FHWA published a new technical advisory on this subject, titled: "[Use of Contractor Test Results in the Acceptance Decision, Recommended Quality Measures, and the Identification of Contractor/Department Risks](#)" (FHWA contact: Matthew Corrigan, HIPT-30, 202-366-1549; [Matthew.Corrigan@fhwa.dot.gov](mailto:Matthew.Corrigan@fhwa.dot.gov)).

[NCHRP Synthesis Number 346, State Construction Quality Assurance Programs](#) provides a national overview of State DOT quality assurance programs.

Massachusetts and Florida have initiated projects that will provide for contractor quality control testing with a certain amount of State acceptance or verification testing. This approach requires a contractor quality control plan and applies statistical specification limits to the contractor quality control results and Agency verification results.

Transportation Research Board Study 01-0405 -"Statistically Based Methods for Verification Testing" provided a national overview of how the State DOTs are currently using split-sample and independent-sample verification procedures for the purpose of comparing test results or verifying the contractor's overall construction process in independent assurance programs and quality assurance construction specifications. The paper provides an understanding of the statistical concepts involved with split-sample and independent-sample comparison procedures, and what information an Agency needs in order to determine if a contractor's overall test results are valid.

**Agencies:** INDOT, VDOT, FDOT, MassHighways

**Contact:** Dennis A. Kuchler, Indiana DOT, (317) 232-5502; Rob Elliott, FDOT, 850-414-4381, Greg Doyle, FHWA-Massachusetts (617) 494-3279

## Cost-Plus-Time Bidding

**Description:** Cost-plus-time bidding, more commonly referred to as the A+B method, involves time, with an associated cost, in the low bid determination. Under the A+B method, each bid submitted consists of two components:

- The "A" component is the traditional bid for the contract items and is the dollar amount for all work to be performed under the contract.
- The "B" component is a "bid" of the total number of calendar days required to complete the project, as estimated by the bidder. (Calendar days are used to avoid any potential for controversy which may arise if work days were used.)

The bid for award consideration is based on a combination of the bid for the contract items and the associated cost of the time, according to the formula:

$$(A) + (B \times \text{Road User Cost/Day})$$

This formula is used only to determine the lowest bid for award and is not used to determine payment to the contractor. The contractor's estimate for the completion of critical work becomes the contract time and an I/D provision is usually used to keep the bidding-playing field level. For critical projects that have high road user delay impacts, the A+B bidding method can be an effective technique to significantly reduce these impacts. After a five-year evaluation period under SEP-14, A+B bidding was declared operational on May 4, 1995 and is no longer considered to be experimental.

On September 30, 2002, Caltrans issued a policy requiring the use of A+B bidding on certain projects with an estimated cost of \$5 million or more and daily road user costs of \$5,000 or more.

**Agencies:** About two-thirds of the states have some experience with the A+B Bidding method. Of these, Missouri, Florida and New York have been the most active users. Caltrans used the A+B Method to reconstruct critical bridges damaged and destroyed in the Northridge earthquake.

**Contact:** For general information—Jerry Yakowenko, FHWA, (202) 366-1562;

### References:

[Minnesota DOT guidance for A+B bidding](#)  
[Washington State DOT Guidance](#)

## Design-Build

**Description:** The design-build concept allows the contractor maximum flexibility for innovation in the selection of design, materials and construction methods. With design-build procurement, the contracting agency identifies the end result parameters and establishes the design criteria. The prospective bidders then develop design proposals that optimize their construction abilities. The submitted proposals may be rated by the contracting agency on factors such as design quality, timeliness, management capability and cost. These factors may be used to adjust the bids for the purpose of awarding the contract.

### Recent Reports:

[AASHTO Design-Build Task Force - Current Practices Report, \(updated annually\)](#)  
[The FHWA's TEA-21 S.1307\(f\) Design-Build Effectiveness Study – Report to Congress, January 2006](#)  
[The FHWA's Report to Congress on Public Private Partnerships, December 2004](#)  
[Contracting for Highway Projects - A Performance Assessment, Tom Warne and Associates, LLC, May 2005](#)

### Agencies:

[Florida DOT](#)  
[Minnesota DOT](#)  
[New York State DOT](#)  
[North Carolina DOT](#)  
[Oregon DOT](#)  
[Virginia DOT](#)  
[Washington State DOT](#)

**Contact:** For general information–Jerry Yakowenko, FHWA, (202) 366-1562;

## Design-Build-Maintain (Operate)

**Description:** Several states have initiated design-build-operate-maintain projects. The Transportation Corridor Agencies in California used this concept on several toll road projects. These toll roads include the San Joaquin Hills Corridor, Eastern Transportation Corridors, and Foothill Transportation Corridors. These three corridors provide more than 60 miles of new freeways at a cost of approximately \$2.5 billion. California Assembly Bill 680 provided the legal authority and financing for several toll roads that will use the plan, design, finance, construct and lease back method of procurement and ownership. This concept has also been utilized on toll-road projects in Virginia, Colorado and Texas.

Canada's Northumberland Strait Crossing Project is a design-build-maintain project that provides for the financing, design, construction and operation of a 12.9-km bridge for 35 years following construction. Similarly, the Ontario Ministry of Transportation constructed the Toronto Toll Highway 407 project under the design-build-operate concept.

In August 2000, [the Massachusetts Highway Department awarded a design-build-operate-maintain contract](#) to Modern Continental to reconstruct Route US-3 from the I-95/Route 128 interchange in Burlington, MA to the New Hampshire border. This \$385 million, 30-year contract will widen the existing 21-mile, two lane highway to include three lanes.

**Contact:** For general information–Jerry Yakowenko, FHWA, (202) 366-1562.

## Design-Build-Warrant

**Description:** Some agencies have combined the conditions of a warranty clause with a design-build contract. This technique seems to

work well with intelligent transportation system projects that incorporate technological features where the contracting agency would benefit from a limited warranty for workmanship, materials and system functionality.

**Agencies:** A number of states, including AK, MI, and UT, have used design-build-warrant projects under SEP-14.

**Contact:** For general information–Jerry Yakowenko, FHWA, (202) 366-1562.

## Design-Sequencing

**Description:** Caltrans does not currently have program wide design-build legislative authority, however, Caltrans is evaluating a unique contracting approach titled “[design-sequencing](#).” Under this procedure, Caltrans prepares the plans to an approximate 30% stage of completion and a traditional construction contract is let and awarded to the lowest responsive bidder. The bid documents must include all potential bid items, however, since the design is not complete, final quantities for all work may not have been determined. Based on their experience to date, Caltrans anticipates keeping design-sequencing in their alternative contracting tool-box for appropriate projects – defined as a ‘clean’ project with minimal public controversy, all environmental documents and permits; an established project footprint; identified utilities and all right-of-way for the initial sequence. Award is based on Caltrans’ having 90% of the pay items and 90% of the quantities for those items.

**Agencies:** Caltrans

**Contact:** Ray Tritt, Caltrans (916) 653-4257.

## Disincentive for Unbalanced Bidding

**Description:** The North Carolina DOT is utilizing a contract provision that delays full payment for contract items that it believes may be unbalanced. The NCDOT believes that this serves as a disincentive for unbalanced bidding.

NCDOT’s standard specification Section 109.4(b) reads as follows:

*Any excess monies included in an unbalanced bid price which the Department determines to be in excess of a reasonable unit or lump sum bid price for the work shall be retained by the Department until the last partial payment estimate, at which time these funds will be paid to the contractor. These retained funds will not be eligible for deposit in any trust account established pursuant to this contract nor for interest for such delay in the payment for the retained portion of the bid price. Partial payment for work performed on an unbalanced bid item shall be at the reasonable unit lump sum price determined in accordance with this sub article.*

*For purposes of this subarticle, a reasonable unit or lump sum price will be deemed to be the average of the Engineer’s Estimate and the individual balanced bid prices received from the other bidders for the item in question.*

**Agencies:** NC

**Contact:** Steve DeWitt, NCDOT, (919) 733-2210

## Early Contractor Involvement

**Description:** The British Highways Agency is piloting a hybrid design-build project delivery method known as early contractor involvement (ECI). The Highways Agency selects a contractor/consultant through a purely qualifications-based procurement process. This procurement typically takes place very early in the project delivery process (the equivalent of the State DOT’s planning or environmental review process). The contractor / consultant then assists the contracting agency with the development of preliminary designs and environmental reviews, and eventually the final design and construction of the project. The primary advantage of this system is the ability of the owner to incorporate the design-builders knowledge and innovations at a very early point in the project

development process.

Several contractual incentives that are based on a target-price system are available to encourage cost-effective design, innovation and high quality in design and construction. See [the 2004 AASHTO / FHWA SCAN of Construction Management Practices](#) for additional information.

**Agencies:** NC

**Contact:** Steve DeWitt, NCDOT, (919) 733-2210 or Jerry Yakowenko, FHWA, (202) 366-1562.

## Electronic Media in the Contracting Process

**Description:** Many states have web pages that provide information on the contracting process. Some list proposed bid letting dates, plan-holders lists, bid tabs from past lettings, average bid unit prices, and award data. Appendix A provides a summary of the current use of electronic contracting procedures in use by the States). Several state DOTs are using electronic media for the advertising and the receipt of bid proposals. Such systems promise potential savings in time and cost to both contracting agencies and contractors.

*Electronic bidding* As of March 2006, approximately 26 states either permit or require electronic bidding. A number of bid preparation software packages are commercially available. Many states use Trns-port's Expedite® bid preparation software (a component of the AASHTO's Trns-port products). Other commercially available software includes: CBID (essentially an Excel Spreadsheet with the Unit price and quantity information) (IL), HwyBid (KY), EBID (MS), ECMS (PA), Quest (RI), SDEBS (SD), UEBS (UT), and Ebids (WA)

*Electronic Documents* - The US Army Corps of Engineers has been using "electronic bid sets" (electronic plans, specifications and proposal documents) for several years. In early 1997, Utah DOT produced an electronic bid document for the mammoth I-15 design-build project. The entire set of contract documents for this \$1.325 billion project was included on a set of 4 CD ROMS. In June 1998, Virginia DOT produced a set of totally electronic bid documents for a pilot project on Route 250, Henrico County. By making electronic files available via CD ROM, users can view, print, zoom-in on pertinent information, measure certain distances and determine areas for quantity take-offs.

*Web-based Labor Compliance* - The Wisconsin DOT is piloting a new software program on the Marquette Interchange project that provides web-based data entry by the contractor. The contractor enters its weekly payroll information into a web based reporting system. This provides immediate feedback to the contractor whenever there is a prevailing wage rate violation. The WisDOT labor compliance staff is then able to use the web-based system as one of its means to check for Davis-Bacon compliance. The system also has the ability to keep a running record of the actual payments made to DBE firms as required by 49 CFR 26.37(c). This allows WisDOT to compare the actual DBE payments with the contract commitments.

*Web-based Permit Compliance* - The City of Reno used a [web-based real-time environmental permit compliance system](#) to document, track and notify the appropriate resource agencies of compliance determinations on the Reno Re-TRAC design-build project. The contracting agency's construction management representative enters compliance information into a web-enable laptop. Real-time email notifications are then distributed to all interested resource agencies.

**Agencies:** See Appendix A

**Contact:** For general information—John Huyer , FHWA, (202) 366-1937

## Escrow of Bid Documents

**Description:** Several states have utilized an escrow of bid document special provision on large complex contracts that have the potential for litigation. Generally, the escrowed documents remain in a depository and are not used until the state receives a notification of intention to file a claim from the contractor. A guide specification for escrowing bid documents can be found in [Section 103.08 of AASHTO's 1998 Guide Specifications for Highway Construction](#).

According to Synthesis No. 28 of the Transit Cooperative Research Program - "Managing Transit Construction Contract Claims", seven of the twenty-one survey respondents indicated that their transit agency was using an escrow of bid document contract

provision. It was noted that the escrow provisions have faced stiff opposition from the construction industry. Others claim that escrow provisions may no longer be as effective as originally conceived. Some in the industry believe the widespread use of sophisticated computer techniques allows the manipulation of the actual bid documents and the creation of a substitute bid document skewing the data differently from the actual bid. The skewed document could then be submitted in escrow as the actual bid preparation document. However, there is no direct evidence that this practice has occurred to date.

**Agencies:** CO, GA, HI, WA, NJ

**Contact:** Jerry Yakowenko, FHWA, (202) 366-1562 for general information

## **Flexible Notice-to-Proceed Dates**

**Description:** For small non-critical projects, such as certain rural bridge replacement projects, North Carolina DOT establishes the number of calendar days that is required to complete the project once work starts. The contractor is given a window of up to six months to start work. Contractors seem to like this flexibility as it allows them to utilize their resources better. NCDOT also recently used this concept in letting a large number of guardrail projects where they were concerned about getting good competition from a limited number of guardrail contractors.

**Agencies:** NC DOT  
[Washington State DOT Guidance](#)

**Contact:** Steve DeWitt, NCDOT, (919) 733-2210

## **Funding of Resource Agency Positions**

**Description:** Several State DOTs currently fund environmental and historic preservation resource agency positions for work associated with their transportation programs. They believe this accelerates their sister State agency's review of transportation programs and develops better working relationships with these agencies. The Ohio DOT currently funds three resource agency positions and the North Carolina DOT currently funds eleven similar positions. The Arizona DOT also has a similar program with its State resource agencies. While this increased flexibility may result in lower bid prices for the owner, it may also have a negative impact in making it more difficult to schedule construction inspection resources.

**Agencies:** ADOT, ODOT, NCDOT

**Contact:** Julio Alvarado, Arizona DOT, (602) 712-7323

## **Improved Motorist Safety in Work Zones by Contracting Methods**

### **Description:**

The FHWA published a [final rule on Work Zone Safety and Mobility](#) in the September 9, 2004 Federal Register. The FHWA's "[Work Zone Mobility and Safety Program](#)" web site provides a wealth of information concerning safety in work zones. In particular, the site provides short case summaries of how various State DOT have used innovative contracting provisions (such as [contract start / duration](#), [contract types](#), [lane rental](#) and [performance warranties](#)) to enhance mobility in work zones.

The [National Work Zone Safety Information Clearinghouse](#) was established in 1998 to provide up-to-date information on work zone-related issues. This includes information on work zone laws, products, public education, public outreach, regulations, research reports, specifications, statistics, training courses and key experts in each of these areas.

Many other states have excellent programs to reduce accidents in workzones. [NCDOT's IMPACT program](#) includes a driver education program which promotes recognition, reaction and responsibility while driving through workzones (call Steve DeWitt for details).

**Contact:** Tracy Scriba, FHWA Office of Operations, (202) 366-0855; Steve DeWitt, NCDOT, (919) 733-2210

## Incentive/Disincentive Provisions for Early Contract Completion

**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, the 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 these 26 projects was \$18,500 and the average project user delay savings was \$610,500. MDOT indicated that I/D provisions will result in an average expenditure of 1.5% of the contract amount.

**Agencies:** Many State DOTs used I/D clauses under FHWA's National Experimental and Evaluation Program No. 24 in the early 1980s. The use of I/D clauses became operational in 1989. A 1990 survey by the Iowa DOT showed that 35 states have used I/D provisions. However, a 1998 informal FHWA survey (with 37 responding Divisions) showed 18 states letting approximately 150 I/D contracts in the past year.

**Contact:** For general information—Jerry Yakowenko, FHWA,(202) 366-1562.

## Indefinite Quantity / Indefinite Delivery

**Description:** Michigan and some municipalities are currently using an innovative contracting method described as “indefinite quantity/indefinite delivery” (ID/IQ, also known as job order, task order, area-wide, county-wide, city-wide, and open ended contracting). Under this method, contractors bid on unit work items with the location to be determined under future work orders. An estimate of the total work over the life of the contract is provided in each contract. In Michigan's project, the State provides a work order for the installation of traffic signals at each location. Several municipalities utilize this contracting method on a city-wide or area-wide basis to provide greater flexibility in the construction program.

DelDOT uses open-ended contracts for an \$80 million roadway rehabilitation program. It uses these contracts to let one-year or multi-year hot-mix overlay contracts in various zones throughout the state. These contracts have allowed DelDOT to complete relatively small resurfacing projects in an efficient and manner.

Florida DOT calls this “push-button” contracting and has been using it for maintenance and traffic operations activities for years.

Various branches of the U.S. military have used job order contracting for facility maintenance, repair, and minor construction (reference the [Federal Acquisition Regulations, Subpart 16.500, Indefinite – Delivery Contracts](#)). In addition, numerous public works departments have utilized ID/IQ or area-wide contracts for guardrail repair, highway sign design and installation, pavement marking, bridge design, bridge maintenance, etc.

**Agencies:** MI, DE, MD, FL

**Contact:** Brenda O'Brien, Michigan DOT, (517) 322-1085.

## Interim Completion Dates

**Description:** Interim completion dates are a means of encouraging the early completion of a specific phase of a contract such as a ramp, an interchange or another component of a larger construction contracts. The particular phase or component should be selected with great caution as this will impact the scheduling of the overall project.

**Agencies:**

[Washington State DOT Guidance](#)

**Contact:** Ron Pate, WSDOT (360) 705.7468.

## Intelligent Transportation System Contract Procurement Techniques

**Description:** The implementation of ITS technologies, either as stand-alone projects or in combination with traditional construction projects, frequently presents some unique challenges concerning procurement techniques. In order to address these evolving issues, FHWA currently has many informational efforts underway to assist the states with procurement issues related to ITS implementation.

Guide to Contracting ITS Projects

[The TRB's April 26, 2006 NCHRP Report 560: "Guide to Contracting ITS Projects"](#) provides guidance on the procurement of ITS projects, including variable message signs, traffic control systems, and related advanced electronic systems.

For additional information concerning the procurement of ITS technology, see the [ITS Joint Program Office Procurement Practices web page](#).

**Contact:** William S. Jones, USDOT ITS Joint Program Office, (202) 366-2128; Emiliano Lopez, FHWA Eastern Resource Center, (410) 962-0116,

## Intelligent Transportation System Technology in Work Zones

**Description:** Intelligent Transportation Systems (ITS) is the application of advanced sensor, computer, electronics, communications technologies and management strategies in an integrated manner to increase the safety and efficiency of travel. Applying ITS to construction work zones could consist of a combination of traffic management and traveler information systems in locations where agencies currently do not have the needed technology infrastructure. These systems provide agencies with the capabilities to control traffic and manage incidents through the implementation of various operational strategies based on current travel demand.

The FHWA Office of Operations has established the ["Work Zone and Mobility Safety Program - Intelligent Transportation Systems \(ITS\) & Technology"](#) web page to describe the use of ITS technology in work zones. This source provide links to the following reports concerning the use of ITS technology in work zones:

[Intelligent Transportation Systems in Work Zones: A Cross-Cutting Study \(FHWA-OP-02-025\) \(2002\)](#)

[Brochure: Informed Motorists, Fewer Crashes: Using Intelligent Transportation Systems in Work Zones \(FHWA-OP-01-043\)](#)

[Intelligent Transportation Systems in Work Zones: A Case Study. Work Zone Traffic and Incident Management System - Keeping Traffic Moving During Reconstruction of the Big I, a Major Interstate-Interstate Interchange in Albuquerque \(FHWA-OP-04-072\)](#)

[Intelligent Transportation Systems in Work Zones: A Case Study. Work Zone Travel Time System - Reducing Congestion with the Use of a Traffic Management Contract Incentive During the Reconstruction of Arizona State Route 68 \(FHWA-HOP-04-032\)](#)

[Intelligent Transportation Systems in Work Zones: A Case Study. Dynamic Lane Merge System - Reducing Aggressive Driving and Optimizing Throughput at Work Zone Merges in Michigan \(FHWA-HOP-04-033\) \(2004\)](#)

[Intelligent Transportation Systems in Work Zones: A Case Study. Real-Time Work Zone Traffic Control System - Using an Automated Traffic Information System to Reduce Congestion and Improve Safety During Reconstruction of the I-55 Lake Springfield Bridge in Illinois \(FHWA-HOP-04-018\).](#)

For additional information concerning an overview of technology used in operations and maintenance operations, see the [ITS Joint Program Office Technology Deployment web site](#).

**Agencies:** See above.

**Contact:** For general information—James Pol, FHWA, (202) 366-4374 or Tracy Scriba, SAIC, (202) 366-0855.

## ISO 9000 Certification

**Description:** As part of an overall effort to improve quality, many agencies are considering the International Standards Organization (ISO) 9000 Certification.

The NY City Triborough Bridge and Tunnel Authority has implemented an ISO 9000 certification process for the Authority. It has implemented a requirement requiring ISO 9000 standards in all contract work.

**Agencies:** NY City Triborough Bridge and Tunnel Authority

**Contact:** Ken Jacoby, FHWA, (202) 366-6503 for general information; Robert Nespeco, Triborough Bridge and Tunnel Authority, (212) 486-2437 for specific information.

## Lane Rental

**Description:** Like cost-plus-time bidding and the active management payment mechanism, 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 give 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.

**Agencies:** Five states have used lane rental and reported favorable results under SEP-14. Lane rental was declared operational 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.

[Minnesota DOT Guidance](#)  
[Washington State DOT Guidance](#)

**Contact:** For general information—Jerry Yakowenko, FHWA, (202) 366-1562;

## Lump Sum Bidding (No Quantities)

**Description:** While lump sum bidding is not new to the highway industry, Florida has developed several lump sum projects under

SEP-14 with a new variation. The contractor is provided with a set of bid documents and is required to calculate quantities and develop a lump sum bid for all work. The contractor bears the responsibility for any change in the estimated quantities. Any costs associated with changed or unforeseen conditions as well as added or deleted work will be negotiated using standard practices. See [Florida DOT's Lump Sum Project Guidelines](#) for additional information.

**Agencies:** Florida DOT

**Contact:** Ken Leuderalbert, Florida DOT, 850-414-4383

## **Multi-Parameter Bidding including Quality (A+B+Q Bidding)**

**Description:** Similar to cost-plus-time bidding, this concept envisions a contracting system where a bidder would bid the cost for completing the work -A, the time for completing critical work -B (optional) , and the level of quality or performance that would be achieved over a specified period of time - Q. A warranty bond or a method of making payment in future years would be necessary to implement this system. A similar concept titled "Pay for Performance" was suggested by Leet Denton and Frederic Lang in 1992 but did not receive a favorable review with many highway industry representatives.

Warranty Performance Bidding (A-Q bidding): Maryland, Kentucky and a few other states have utilized a multi-parameter bidding to determine the length of a project warranty. On a Maryland bridge painting project, the bidders established the length of the warranty by an A-Q formula where A is the cost of the project and Q is the credit for each year that the contractor bids beyond the minimum five-year period up to a maximum of ten years. The contractor was given a credit of \$35,000 for each additional year beyond the five-year period. For example, if the contractor submitted a bid of \$300,000 and agreed to provide an eight-year warranty, their bid would be reduced by \$105,000 (3 time \$35,000). Their bid for award comparison purposes would be \$195,000, but the official contract amount would be \$300,000. Maryland SHA determined the credit amount by estimating the cost to repaint the structure and dividing it by the ten-year warranty period.

The Kentucky Transportation Cabinet utilized multi-parameter bidding on an alternate pavement type bidding project. Proposers were required to provide a five-year minimum warranty. For each additional year of warranty offered, their bid price for consideration was reduced by a fixed amount.

**Agencies:** Maryland SHA, Kentucky Transportation Cabinet

**Contact:** Gary Sharp, KYTC, (502) 564-3280

## **No Excuse Incentives**

**Description:** Florida DOT has used No Excuses Bonus\* contracts to give the contractor an incentive to complete the contract work on time. The contractor is given a "drop-dead date" for completion of a phase of work or the entire project. If the work is completed in advance of this date, the contractor will receive a bonus. There are no excuses, such as weather delays, for not making the completion date. On the other hand, there are no disincentives (other than normal liquidated damages) for not meeting the completion date.

Other states are also proceeding with different versions of a "no excuse incentive" (NEI) clause.

Iowa DOT used an NEI clause that will provide for a \$250,000 incentive for early completion on an I-35 reconstruction project. The NEI provision simply states that "any delays due to weather, change orders, overruns of quantities, utility delays, or any other delays will not be considered as justification to modify the calendar date."

[Virginia DOT used an NEI provision](#) on a \$100 million contract that is the first phase of the massive Springfield interchange project. An NEI provision will provide for a \$10 million incentive for the completion of critical work by August 18, 2001 or a \$5 million incentive for completion by November 17, 2001. A noteworthy provision in VDOT's clause requires the contractor to sign a statement releasing the state from any and all claims, causes, issues, demands, disputes and matters of controversy of any nature or kind.

[Minnesota DOT's December 2005 Innovative Contracting Guidelines](#) (page 14) provides guidance for the use of “no excuse bonus” provisions.

\* The term incentive is preferred rather than ‘bonus’. The incentive amount should be based on a public savings for opening the project early (road user cost, or other as appropriate). The term bonus implies something paid in addition to what is expected - sometimes not having a basis in cost or benefit.

**Agencies:** Florida DOT, Virginia DOT, Iowa DOT.

**Contact:** Ken Leuderalbert, Florida DOT, 850-414-4383; Lee Onstott, New Mexico SHTD, 505-827-5631.

## **Performance-Related Specifications (PRS)**

**Description:** Performance-related specifications (PRS) are quality assurance specifications that describe the desired levels of key materials and construction quality characteristics that have been found to correlate with fundamental engineering properties that predict performance. These quality characteristics (for example, air voids in asphaltic pavements, and strength of concrete cores) are amenable to acceptance testing at the time of construction. True performance-related specifications not only describe the desired levels of these quality characteristics, but also employ the quantified relationships containing the characteristics to predict subsequent pavement performance. They thus provide the basis for rational acceptance and/or price adjustment decisions. Simply put, PRS are improved quality assurance specifications. Their major distinguishing feature is the use of improved acceptance plans with rationally derived performance-related price adjustments.

See the following web sites for information on the implementation of performance related specifications:

[FHWA's "Performance Specifications Strategic Roadmap, A Vision for the Future, Spring 2004"](#)

[FHWA's "Construction and Maintenance Fact Sheets, Performance-Related Specifications:, Next Step in Pavement Quality"](#)

[FHWA's "Performance-Related Specifications for PCC Pavements,"](#) Volumes I-IV, Publication No. FHWA-RD-98-171, February 1999.

**Agencies:** IN, NJ, IA, NM, MO, KS, CA

**Contacts:** Ken Jacoby, FHWA, (202) 366-6503; Peter Kopac, FHWA (202) 493-3151, or Gary Crawford (202) 366-1286 for PRS Evaluations; Ted Ferragut, TDC Partners, 703-836-1671.

**References:** (1)

## **Practical Method of Paying for Unabsorbed Home Office Overhead (UHOO) Costs**

**Description:** Agencies are often faced with the problem of determining the amount of compensation for UHOO costs paid to contractors due to owner-caused delays. If a state has the legal authority to pay unabsorbed home office overhead, typically an agency can: 1) pay overhead and indirect cost charges as claimed by the contractor, 2) conduct a lengthy and costly audit of the contractor's financial records to establish acceptable compensation levels for these claims, or 3) negotiate with the contractor for a mutually acceptable compensation level. All three of these approaches are inconvenient, costly and time consuming.

[NCHRP Project 20-5, Synthesis 32-10 "Compensation for Contractors Home Office Overhead"](#) documents how State DOTs are compensating contractors for unabsorbed home office overhead for contract delays. It identifies the methods and percentages currently being used and report on the advantages and disadvantages of each method of compensation.

Through a series of pilot projects, Caltrans contracted with Navigant Consulting, Inc. to evaluate the effectiveness of their Time-related-overhead specification. This 2003 study concluded that the provision appears to be beneficial, to the extent that the Caltrans is able to limit the magnitude of time extensions granted under its contracts. The study found that there were fewer change order expenditures and less identifiable overhead compensation paid (as a percentage of change order cost ) on the “time-related-overhead”

(TRO) projects than on the Non-TRO Projects studied.

The Caltrans a special provision provides a payment method for unabsorbed home office overhead under certain conditions. The payment is based on a percentage of the total contract amount with the following conditions:

- For UHOO delays less than or equal to 12 percent of the number of working days originally specified in the contract, no payment is made.
- For UHOO delay days greater than 12 percent and less than or equal to 49 percent of the number of working days originally specified in the contract, UHOO will be computed as 5 percent of the contractor's original contract bid amount divided by the total number of working days originally specified in the contract, multiplied by the number of UHOO delay days exceeding 12 percent .
- If UHOO delays exceed 49 percent , an audit will be conducted by Caltrans to determine the payment for unabsorbed extended UHOO.

FHWA has allowed participation in UHOO costs only in cases when the owner agency caused the delay during which time the UHOO costs could not be charged off to earnings and the contractor was prevented from doing other work . Otherwise FHWA's position has been to disallow UHOO when a State's standard specification for extra work and force account work provide for full compensation at either the contract unit price, or a negotiated unit price.

**Agencies:** CA

**Contact:** Joe Dobrowski, Caltrans, (916) 654-2157

## **Prompt Payment / Return of Retainage**

**Description:** The recently revised US DOT DBE regulations (49 CFR Part 26.29) require a contract clause for prompt payment and return of retainage to all subcontractors. The first provision requires prime contractors to pay subcontractors for satisfactory performance of their contracts. The second provision also provides that there is a prompt return of retainage payment for the prime to the subcontractor when the subcontractor's work is satisfactorily completed. On May 8, 2001, the US DOT issued a Notice of Proposed Rule Making which proposes several modifications to the above regulation to allow more flexibility in making prompt payments.

For a current summary of the state of the practice related to DBE / Construction Management issues, see:

- [NCHRP Synthesis No. 343 - Management of Disadvantaged Business Enterprise Issues in Construction Contracting](#). This synthesis summarizes State DOT procedures to implement the DBE regulations pertaining to bidder's lists, prompt payment, return of retainage, actual achievements, good faith efforts, commercially useful functions determinations, etc.
- [The Wisconsin DOT Transportation Synthesis Report titled: "Disadvantaged Business Enterprise Programs Research and Best Practices."](#)

*Prompt Payment:* The regulation did not result in major changes to the current practices of 31 State DOTs. The most dramatic impact of the regulation was that, for the first time, ten State DOTs and the Virgin Islands established prompt payment provisions (GA, KS, KY, MT, NE, NC, ND, OK, PR, SD, VIR IS).

*Return of Retainage:* By contrast, the regulation had a significant impact on most of the State DOTs standard practices. In 33 states, the triggering mechanism for release of such monies was changed from the acceptance of the total contract to the satisfactory completion of the subcontractor's work during the life of the contract. The most dramatic impact of the regulation was that nine states eliminated the practice of withholding retainage from primes (CO, GA, KS, KY, MT, NC, OH, VT, VA). Five states are also prohibiting primes from withholding retainage from subcontractors (CO, GA, KY, OH, VT).

**Contact:** Charles Klemstine, FHWA Office of Civil Rights, (202) 366-6753.

## **Public-Private Partnerships / Toll Roads / Concessions**

**Description:** The National Council on Public Private Partnerships – defines a public-private partnership as a “. . . contractual agreement between a public agency (federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility.”

Under the concession approach, a private firm or consortium will design, finance, build (or re-build) operate and maintain a large scale transportation project of a long period (typically from 30 to 99 years). For toll road projects, the project agreement includes long term tolling provisions. In lieu-of tolling, the owner also has the option of reimbursing the private firm through predetermined payments over the life of the concession.

#### **Agencies:**

- CA - [SR-91 Express Lanes](#)
- CO- [E-470 Toll Road](#)
- VA-[Dulles Greenway](#)
- [VA Public-Private-Transportation Act](#)
- [New Brunswick, Canada-Design-Build-Operate-Maintain, Prince Edward Island Bridge](#)
- [Texas Turnpike Authority, Trans-Texas Corridor](#)
- [Chicago Skyway privatization](#)

On October 6, 2004 the FHWA launched a new experimental program to allow contracting agencies to implement public-private-partnerships in the Federal-aid highway program. Special Experimental Project No. 15 (SEP-15) was designed to encourage innovative solutions to surface transportation problems and stimulate the development of new technology. [The FHWA's October 6, 2004 Federal Register](#) published an official notice of this policy. SEP-15 addresses four major components of project delivery: contracting; compliance with FHWA's National Environmental Policy Act and other environmental requirements; and compliance with FHWA's right-of-way acquisition policies ; and compliance with FHWA's project finance requirements. The lessons learned from SEP-15 will aid FHWA in developing more effective approaches to project planning, project development, finance, design, construction, maintenance, and operations.

The FHWA's [December 2004 Report to Congress on Public-Private Partnerships](#) is a comprehensive summary of current issues, barriers and case studies.

[Current Practices in Public-Private Partnerships for Highway Projects](#) (July 2005, Prepared for Maryland SHA by KCI Technologies, Inc.)

[FHWA Manual for Using PPPs on Highway Projects](#)

[Synthesis of Public-Private Partnership Projects for Roads Bridges & Tunnels from Around the World – 1985-2004](#)

**Contact:** Virginia's Public-Private Transportation Act – Tom Pelnik, VDOT, (804) 786-1103,

## **Quality Assurance Specifications**

**Description:** AASHTO defines quality assurance as “all those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality.” Quality Assurance specifications (previously referred to as QC/QA specifications) are mathematical probability (statistically) based specifications that recognize the normal variability of construction materials. They assign quality control sampling, testing, and inspection responsibility to the contractor and include some level of acceptance sampling, testing, and inspection by the Agency. Random sampling and testing is required to measure the statistical quality level of materials produced and placed. Quality assurance specifications identify specific quality characteristics to be measured for acceptance and typically provide for price adjustments related to a defined quality level of the product.

The Quality Construction Task Force of the AASHTO Subcommittee on Construction published a document titled “1999 Construction Quality Management Database Survey”. This is a convenient summary of the state DOTs' practices for Quality Assurance and Performance Related specifications. The AASHTO Implementation Manual for Quality Assurance (February 1996) and companion Quality Assurance Guide Specification (February 1996), as well as the National Quality Improvement Task Force Report on Quality Assurance Procedures for Highway Construction (FHWA DP-89, June 1994) are useful reference documents to assist in developing and implementing Quality Assurance specifications.

Agencies: At least 44 states in the U.S. and 3 Provinces in Canada use Hot Mix Asphalt QA specifications; about a dozen states use Portland Cement Concrete pavement and/or structural QA specifications; and a few states use QA specifications for embankments and aggregate base.

**Contact:** Ken Jacoby, FHWA, (202) 366-6503; or Peter Kopac, FHWA, (202) 493-3151

## Quality Factors Affecting Prequalification, Bidding, and Contract Administration

**Description:** Several states currently have specifications and policies that allow for the use of past performance information, construction quality and contract progress in the contract administration process.

### Summary of current practices:

For a current summary of the state of the practice, see the Wisconsin DOT Transportation Synthesis Report titled: "[Contractor Prequalification Quality-Based Rating](#)."

[NCHRP Report 10-54 "Quality-Based Performance Rating of Contractors for Prequalification and Bidding Purposes"](#) (March 2001) provided an implementation guide for using contractor performance ratings in either prequalification or bid-selection.

[The 2002 AASHTO Subcommittee on Construction, Contract Administration Section, Survey Regarding State DOT Approaches for Dealing with Unsatisfactory Contractor Performance](#) provided a summary of State DOT practices regarding the use of performance evaluation information.

Use of performance ratings to influence contract retainage - Maryland SHA has initiated a program to reduce the retainage requirements of contractors based on their performance ratings. Contractors with "A" evaluations for the last two years may have their retainage reduced from the normal 5 percent to 0 percent. This requirement is subject to the contractor's ability to maintain an "A" rating through interim reviews. Contractors with a "B" evaluation for the last two years may receive a reduced retainage requirement of 2.5 percent. Contractors with a "C" rating will be subject to the normal MDSHA 5 percent requirement. Contractors with a "D" rating for the last two years will begin at a 5 percent retainage and will be evaluated monthly with the retainage being raised to 10 percent for continued "D" performance. New bidders who have not previously been rated by MDSHA may be eligible for a reduction in retainage based on their past performance on highway and bridge work which can be documented by other public agencies. All other contractors who do not have a current rating would start with a 5 percent retainage.

Use of qualifications criteria to adjust bidding: The Oregon DOT used a form of price/qualifications-based bidding to replace the counterweight trunnion assemblies on the I-5 lift span bridge over the Columbia River. This contract was awarded on the basis of the highest composite score considering both price information and technical criteria. The composite score was determined with a 50 percent weight for cost and 50 percent weight for technical qualifications. The technical evaluation factors include: 1) waterfront/moveable bridge construction experience, 2) fabrication of complex machinery experience, 3) crane maintenance, inspection and operation, and 4) construction management team.

Oregon DOT was pleased with the use of this contracting method. Five contractors bid the project. It so happened that the contractor receiving the highest technical evaluation score was also the lowest bidder. Christie Constructors completed the critical contract work 14 days ahead of schedule and received the maximum incentive award. [NCHRP 451, Appendix D, includes a Case Study for Best Value Contracting, that summarizes the Oregon Department of Transportation's experience with a pilot project on the Interstate 5 Columbia River Bridge.](#)

Use of contract progress information to adjust prequalification ratings: Virginia standard specification 102.01 allows VDOT to temporarily disqualify a bidder when the dollar value of work completed on a current contract is more than ten percent of the dollar value of the work that should have been completed on the basis of the contractor's latest approved progress schedule. VDOT uses this clause judiciously and provides contractors with ample notification and due process to allow a contractor to explain the reasons for the lack of progress.

Similarly, Section 108-8 of the North Carolina DOT specifications allows the state to remove a contractor from the qualified bidders list when a contractor can not justify unsatisfactory progress (generally described as more than 15 percent behind the progress schedule).

Use of performance ratings for contract incentives: Arizona DOT evaluated a performance incentive system on a \$70 million urban design-build project. ADOT used quantified checklists as a basis for incentive payments. ADOT utilized a contractual provision which made available an incentive payment (up to \$260,000) for development and successful implementation of a

workmanship inspection program internally to the design-builders organization.

Use of performance ratings to adjust prequalification ratings and eliminate performance bonds: The Ontario Ministry of Transportation utilizes a prequalification rating system that includes factors for contractor performance and quality considerations. The prequalification ratings ensure that any contractor who wishes to bid on contracts is financially and technically capable of satisfactorily perform the work within the specified time. Initially, the Ministry intended to apply these rating criteria to the bidding process, however, industry concerns led the Ministry to limit this approach to their prequalification process. In conjunction with this program, the Ministry has eliminated the requirement for performance bonds and relies strictly on this prequalification program to ensure project completion.

International use of contractor performance ratings: [The 2004 AASHTO / FHWA SCAN of Construction Management Practices](#) discusses the use of contractor performance evaluation systems in Canada and several Western European countries.

**Agencies:** VA, NC, Mid-Bay Bridge Authority, Florida (Gene Figg 850-224-7400 ), Ontario Ministry of Transportation

**Contact:** North Carolina DOT, Steve DeWitt (919) 733-2210; Ontario Ministry of Transportation - David G. Manning, (905) 704-2197.

## Shadow Tolls

**Description:** Shadow tolls are fees paid to a facility operator by an owner (not by the facility users) for the services provided by the operator over the life of the franchise agreement. The shadow toll amount is based upon the type of vehicle and the distance traveled. This contracting technique is both an element of the owner's highway finance plan and a contracting mechanism where a private developer / facility operator accepts the risks of designing, building, financing and operating (DBFO) a highway facility. The concept of shadow tolls is particularly applicable to public/private partnerships and it is being used in the United Kingdom to develop a private sector of the highway industry that has the capability to perform all functions of the highway agency.

The URS / Greiner's March 1998 Report titled "The Selective Use of Shadow Tolls in the United States" documents the applicability and use of this concept (<http://www.fhwa.dot.gov/innovativefinance/shadtoll.htm>).

**Countries:** United Kingdom, Finland

**Contact:** Raymond Tillman, PE, URS/Greiner Inc., 212-736-4444

## Systems Integrator / Systems Manager

**Description:** Some ITS projects utilize this contracting technique to procure the services of a systems integrator / systems manager during the planning, design and construction of a project. The system integrator divides the project into several subsystems, designs all subsystems, provides technical advice relative to complex and critical components, develops system software, integrates and tests subsystems, and supervises operator training. The system integrator is precluded from performing the construction work of the deployment but can be retained to augment the transportation agency's project management capability with contract administration, project management, project inspection and construction supervision activities.

Under FHWA's SEP-14 program, Kentucky and Colorado have used the system integrator / system manager concept to plan, design and construct ITS facilities. Some of the construction work will be let and administered by competitively bid subcontracts awarded by the system integrator. It is recognized that there may be some ITS construction elements which would be more desirable to let as subcontracts to the system integrator contract. In certain situations, it will be a logical assignment of risk and responsibility to perform the work by a subcontract to the system integrator rather than through a prime contract administered by CDOT. FHWA's SEP-14 approval may be necessary on FHWA-funded projects, if an owner desires to combine "design and construction" services within the scope of the systems integrator / system manager contract.

**Agencies:** Advanced Traffic Management Systems in Atlanta; Boston; Cincinnati; Dallas; Fort Worth; Hartford, CT; Houston; Maryland CHART; Montgomery Co., MD; NJ Magic I-80; and Orlando.

**Contact:** Jon Obenberger, FHWA, (202) 366-2221

## Train Technicians, Construction Superintendents, Operating Craftsmen and Engineers

**Description:** An organization, known as the [Transportation Curriculum Coordination Council](#) (TCCC), has been formed to prioritize and coordinate training development initiatives in construction, maintenance, materials, project management, and associated transportation disciplines in order to better focus efforts and resources nationally. The Federal Highway Administration's Office of Asset Management (HIAM) provided the impetus.

The TCCC's mission is to provide leadership at a national level, develop and maintain a national curriculum for various transportation disciplines, identify training and certification requirements, and coordinate/facilitate training efforts.

**Contacts:** [See the individual State DOT and program area contacts for the TCC.](#)

## Warranties

**Description:** Warranties have been successfully used by some states on non-Federal projects for many years, to protect investments from early failure. Prior to 1991, the FHWA had a long-standing policy that restricted the use of warranties to electrical and mechanical equipment. The rationale for the restriction was that such contract requirements may indirectly result in Federal-aid funds covering maintenance costs, and the use of Federal-aid funds for routine maintenance is prohibited by law.

On August 25, 1995, FHWA published an Interim Final Rule (IFR) for warranties for projects on the NHS. The IFR states that warranty provisions shall be for a specific construction product or feature. Routine maintenance items are still not eligible. The IFR also prohibits warranties for items not within the control of contractors. The warranty Final Rule was published in the April 19, 1996, *Federal Register*. For non-NHS projects, warranty clauses may be used in accordance with State procedures.

Some construction industry associations have taken a position against any warranty provision that unfairly burdens a contractor with the responsibility for items that are not within its control. Highway contractors do not have control over the myriad of elements that affect the durability of a highway project (level of public investment—initially and in routine maintenance; specification of design and materials, traffic volume and axle loads). Small contractors may be unable to bond many construction projects.

Warranties are popular in Europe, where a few huge, often government-controlled, companies dominate the construction industry. The situation is different in America, where the highway industry consists of nearly 9,000 small construction companies employing more than 255,000 people. The states and industry need to work cooperatively in developing any warranty provisions.

### Agencies:

In May 2003, [Michigan DOT hosted an invitational pavement warranty symposium](#). The proceedings of this meeting provide a useful summary of the current state of the practice for pavement warranties.

[NCHRP has initiated Research Project 10-68, "Guidelines for the Use of Highway Pavement Warranties"](#). This study will provide guidelines for the project-level application of pavement warranties. It will assist state highway agencies in determining when and how to use warranties for construction of both asphalt and Portland cement concrete pavements.

[Ohio DOT Warranty Guidelines](#)

**Contact:** For general information—Jerry Yakowenko, FHWA, (202) 366-1562; Eva Flom, FHWA (202)-366-2169

## Wrap-Up Insurance

**Description:** Some contracting agencies have utilized an insurance program called "wrap-up" or "owner controlled insurance" to meet their insurance needs on large projects. The Boston Central Artery Project and the Utah I-15 design-build project are two Federal-aid highway projects that have utilized this technique.

The promoters of this type of insurance claim the following benefits of wrap-up policies:

- Lower overall insurance costs through reduced bid prices,
- Elimination of contractor's mark-up on insurance premiums,
- Improved engineering and loss prevention services controlled by one insurer, and
- On-site medical treatment to handle injuries.

Administrators who have expressed concerns with the potential disadvantages of wrap-up policies question its cost effectiveness for average or smaller projects. The purported "instant savings" of lowered bid prices are not easily verifiable. Firms with established safety records are not always rewarded for their diligence, while average or below average firms may be mixed in with other firms in the project policy.

[NCHRP Project 20-5, Synthesis 32-12, "Owner Controlled Insurance Programs"](#), provides information regarding the history and use of OCIPs in the design and construction of transportation projects.

**Agencies:** MA, UT, MI, WMATA (Washington, DC Metro), LACTC (Los Angeles subway system)

**Contact:** For general information– Edwin Okonkwo, FHWA, 202-366-1558; George Tinker, Risk Manager, Colorado DOT, 303.757.9579.

**Appendix A – Current Use of Electronic Contracting Procedures**





**Summary of State Transportation Agency Bidding Information Available on the Internet**

STA	Web Page	Bid Packages					Addenda							Data Available on Website																												
		Registration Required for Access					Transmittal via							EBS Files																												
		Paper	CD	Internet (Info. Only)	Internet (Bidding)	Plans	Source of Electronic Bid Packages	Certified Mail	Electronic Mail	Electronic Media	Fax	Telegram	Diskette		Internet	Not Specified	Internet	Diskette	Standard Specifications	Supplemental Specifications	Special Provisions	Bid Questions and Answers	Letting Info	Bid Totals	Bid Tabs	Avg. Unit Prices	Fuel Price Index	Roadway Excavation Index	Aggregate Base Index	Asphalt (Bitum. Mat.) Index	Asphalt (Bitumin. Surf.) Index	PCC Pavement Index	PCC Structure Index	Steel Price Indices	Steel (Bar Reinforcing) Index	Steel (Structural) Index	Planholders	Prequalified Firms	DBE Firms	DOL Wage Rates	Approved Product List	
New Hampshire	<a href="#">NH DOT Business Center</a> <a href="#">Qualified Products</a>	X											X			X	X			X	X	X	X													X	X				X	
New Jersey	<a href="#">NJ DOT Current Advertised Projects</a> <a href="#">New Jersey DOT - Bid Express</a> <a href="#">NJ DOT Approved Materials</a>	X	X	X	X	X	Bid Express	X					X				X				X	X	X	X			X									X	X	X				
New Mexico	<a href="#">Plans, Specifications and Estimates (PS&amp;E) Section</a> <a href="#">New Mexico DOT - Bid Express</a> <a href="#">Approved Products List</a>	X	X	X	X	X	Bid Express	X				X	X	X			X	X	X		X	X	X													X	X				X	
New York	<a href="#">Doing Business With NYSDOT - Contractors</a> <a href="#">Materials - Approved List</a>	X						X	X						X	X					X	X	X	X			X							X	X	X	X				X	
North Carolina	<a href="#">North Carolina DOT - Letting Information</a> <a href="#">North Carolina DOT - Bid Express</a> <a href="#">Approved Products List</a>	X	X	X			NCDOT Bid Express						X		X	X	X	X	X		X	X	X	X			X							X	X	X					X	
North Dakota	<a href="#">NDDOT Bid Opening Information</a> <a href="#">NDDOT Home Page - Bid Express</a>	X						X	X	X	X	X			X	X	X				X	X	X	X				X							X	X	X					
Ohio	<a href="#">Division of Contract Administration</a> <a href="#">DigitalPaper XE@ - Ohio DOT</a> <a href="#">Ohio DOT - Bid Express</a> <a href="#">Certified Producers and Suppliers</a>	X	X	X			DigitalPaper XE Bid Express	X					X		X	X	X	X	X	X	X	X	X	X			X								X	X	X	X				X
Oklahoma	<a href="#">OkDOT Contracts &amp; Proposals Information</a> <a href="#">Oklahoma DOT - Bid Express</a> <a href="#">Materials/Sources Index</a>	X	X	X			Bid Express						X		X	X					X	X	X	X											X	X	X				X	
Oregon	<a href="#">ODOT Construction - (Highway &amp; Bridge Contracts)</a> <a href="#">Qualified Products</a>	X											X			X	X	X	X	X	X	X	X	X			X							X	X	X	X	X				X
Pennsylvania	<a href="#">PennDOT ECMS Frameset</a> <a href="#">New Product Evaluation Program</a> <a href="#">Approved Bridge and Structure Products</a>	X		X			PennDOT						X		X	X	X	X	X	X	X	X	X	X			X								X	X	X					X
Puerto Rico	<a href="#">Departamento de Transportación y Obras Públicas</a>	X																																								
Rhode Island	<a href="#">RIDOT Current Bid Opportunities</a> <a href="#">RI Dept of Administration - Division of Purchasing</a>	X	X				CD						X		X	X	X	X	X	X	X	X	X	X			X								X	X	X	X				X
South Carolina	<a href="#">Doing Business with SCDOT - Construction Extranet</a> <a href="#">South Carolina DOT - Bid Express</a> <a href="#">Approval Sheets &amp; Policies for Construction Materials</a>	X	X	X			Bid Express						X		X	X					X	X	X	X			X	X								X	X					X
South Dakota	<a href="#">SDDOT / Operations / Bid Letting / EBS Lettings</a> <a href="#">Approved Products List</a>	X		X			SDDOT	X		X		X			X	X	X	X	X	X	X	X	X												X	X	X	X				X
Tennessee	<a href="#">Construction Division - Tennessee DOT</a> <a href="#">Tennessee DOT - Bid Express</a> <a href="#">QPL</a>	X	X	X	X		TDOT Bid Express						X		X	X	X	X	X	X	X	ALB	X	X	X		X									X	X					X
Texas	<a href="#">TxDOT Contractor Services - Letting Information</a> <a href="#">TxDOT Contractor Services - Plan Information</a> <a href="#">Material Producer List</a>	X	X	X			TxDOT	X				X			X	X	X	X	X	X	X	X	X													X	X	X				X



### Summary of State Transportation Agency Bidding Information Available on the Internet

STA	Web Page	Registration Required for Access	Bid Medium				Software		Date of Internet Bidding Implementation	Real-Time WebCasts			Bond Medium		Time Difference Receipt to Reading	Remarks	Last Updated
			Paper	Disk/CD	Internet	Internet Only	Bid Preparation	Internet Bid Submittal		Real-Time Bid Results	Audio WebCast	Video WebCast	Electronic	Paper			
Alabama	<a href="#">Alabama DOT - Project Letting Information</a> <a href="#">Alabama DOT - Bid Express</a> <a href="#">Material Sources</a>	X	X	X	X	Expedite	BE	01/13/2006					X				09/22/2005
Alaska	<a href="#">Construction Bidding, Procurement, Alaska DOT&amp;PF</a> <a href="#">Southeast Region Bid Calendar</a> <a href="#">Statewide Materials Resources</a>		X	X									X			Currently, electronic bidding documents (Invitations to Bid, plans, specifications, etc.) only available from SE Regional Office	09/22/2005
Arizona	<a href="#">Contracts &amp; Specifications</a> <a href="#">Arizona DOT Home Page - Bid Express</a> <a href="#">Approved Products List (APL)</a>	X	X		X	Expedite	BE	03/28/2003				X	X			Bond validation - Surety 2000 and Sure Path Network. Initial EBS files on the ADOT web site, but not addenda	09/28/2005
Arkansas	<a href="#">Contractor Information</a> <a href="#">Contractor Information</a>		X	X		Expedite				X			X				09/28/2005
California	<a href="#">Caltrans - Currently Advertised Projects</a> <a href="#">Caltrans - Office Engineer - Ads for Bid</a> <a href="#">Caltrans Pre-Qualified Products List</a>		X										X			Conducted Internet bidding pilot in 2002 . Now looking at SiteManager. EBS files - bid items only, no quantities	10/01/2005
Colorado	<a href="#">Bidding</a> <a href="#">APL Main</a>		X	X		Expedite							X			Bidders not using Expedite charged \$25	10/01/2005
Connecticut	<a href="#">ConnDOT Construction Bids Menu</a> <a href="#">New Product Evaluation Policy</a>		X										X				10/01/2005
DC	<a href="#">Office of Contracting and Procurement</a> <a href="#">District Department of Transportation</a>		X										X			Amendment Information sheet on "Solicitation Details" page. No Approved Products List on web site.	10/06/2005
Delaware	<a href="#">Delaware DOT - Doing Business with DelDOT</a> <a href="#">Approved Product List - Soil Retention Blanket Mulch</a>		X	X		Expedite							X				10/01/2005
Florida	<a href="#">Florida DOT - Contracts Administration - Home Page</a> <a href="#">Florida DOT Home Page - Bid Express</a> <a href="#">Qualified Products List (QPL) Index</a> <a href="#">APL - Traffic Control Signals &amp; Signal Devices</a>	X	X		X	Expedite	BE	09/29/2004				X	X			All bidders must use Expedite	09/30/2005
Georgia	<a href="#">Georgia DOT - Doing Business</a> <a href="#">GDOT-Office of Contract Administration</a> <a href="#">Georgia DOT Home Page - Bid Express</a> <a href="#">GDOT-Office of Contract Administration</a>	X	X		X	Expedite	BE	09/17/1999					X	2 Hrs.	Expedite required for construction contracts > \$500k	10/06/2005	
Hawaii	<a href="#">Business Related Information</a>		X										X			Bidders borrow plans & specs from DOT. No Approved Products List on web site.	10/05/2005
Idaho	<a href="#">Contractor Information Homepage</a> <a href="#">Qualified Products List</a>		X			Expedite							X				10/06/2005
Illinois	<a href="#">Illinois DOT - Letting and Bidding Information</a> <a href="#">Approved Lists for Materials</a>		X			CBID/Excel							X			Intends to issue an RFP for electronic bidding in July 2005.	10/09/2005
Indiana	<a href="#">Indiana DOT - Doing Business with INDOT</a> <a href="#">Doing Business with INDOT -Approved Materials</a>		X			Expedite							X				10/09/2005
Iowa	<a href="#">Office of Contracts - Iowa DOT</a> <a href="#">Iowa DOT Home Page - Bid Express</a> <a href="#">Approved Products List</a>	X	X		X	Expedite	BE	04/03/2001					X			Excellent overview of bidding process	10/09/2005

## Summary of State Transportation Agency Bidding Information Available on the Internet

STA	Web Page	Registration Required for Access	Bid Medium				Software		Date of Internet Bidding Implementation	Real-Time Webcasts			Bond Medium		Time Difference Receipt to Reading	Remarks	Last Updated
			Paper	Disk/CD	Internet	Internet Only	Bid Preparation	Internet Bid Submittal		Real-Time Bid Results	Audio WebCast	Video WebCast	Electronic	Paper			
Kansas	<a href="#">Kansas DOT: Information for Highway Contractors</a> <a href="#">KDOT: Home Page - Bid Express</a> <a href="#">Pre-Qualified Materials Listing</a>	X	X	X	X	Expedite	BE	7/19/2006(T)	X			X	X	30 min.	KsDOT currently testing Bid Express.	04/25/2006	
Kentucky	<a href="#">KYTC - Division of Contract Procurement</a> <a href="#">List of Approved Materials</a>		X	X		HwyBid							X		Bidders Required to use HwyBid to develop bid	10/09/2005	
Louisiana	<a href="#">LA DOTD - Construction Letting</a> <a href="#">Electronic Plans Distribution Center- Loqon</a> <a href="#">LADOTD Home Page -Bid Express</a> <a href="#">QPL - Table of Contents</a>	X X	X	X	X	Expedite	BE	01/25/2006					X	X	Bid list only shows apparent low bid. Addenda - list only, no details	02/24/2006	
Maine	<a href="#">Welcome to the MaineDOT</a> <a href="#">Maine DOT Home Page - Bid Express</a> <a href="#">Approved Products List</a>	X	X		X	Expedite	BE	07/02/2003					X			10/11/2005	
Maryland	<a href="#">MDSHA: Contractors Information Center</a> <a href="#">Maryland Product Evaluation List</a>		X										X		Using other modules of TrnsPort Suite - Estimator, BAMS/DSS. MDSHA has legal issues regarding bonding and electronic signatures related to electronic bidding.	09/30/2005	
Massachusetts	<a href="#">Executive Office of Transportation</a> <a href="#">Welcome to Comm-PASS</a> <a href="#">Qualified Construction Materials</a> <a href="#">Approved Fabricators</a>	X	X										X			10/11/2005	
Michigan	<a href="#">MDOT - BIDS Information</a> <a href="#">Capital Imaging - Lansing, MI</a> <a href="#">Motor City Imaging - Total Information Mangement</a> <a href="#">Michigan DOT Home Page - Bid Express</a> <a href="#">Materials Source Guide</a>				X	Expedite	BE	11/02/2001	X				X		All projects bid via Internet starting 04/01/2005	10/13/2005	
Minnesota	<a href="#">Mn/DOT: Bid letting - One Item Per Line page</a> <a href="#">Minnesota DOT Home Page - Bid Express</a> <a href="#">Approved Products and Materials</a>	X	X	X	X	Expedite	BE	01/18/2002	X				X	X	Excellent overview of bidding process. MnDOT site lists only an Addenda list. All projects >\$5 M bid via Internet	10/14/2005	
Mississippi	<a href="#">Doing Business</a> <a href="#">shopMDOT</a> <a href="#">Approved Sources of Materials - Products List</a>		X	X	X	MDOT E-Bid	MDOT E-Bid			X			X			11/29/2005	
Missouri	<a href="#">Business Home</a> <a href="#">Pre-Qualified Products</a>		X			Expedite					X		X		MODOT is scheduled ot implement electronic bid transmission in January 2007.	06/15/2006	
Montana	<a href="#">MDT Current Letting Information</a> <a href="#">Montana DT Home Page - Bid Express</a> <a href="#">Qualified Products List</a>	X	X	X	X	Expedite	BE	07/21/2005					X	1 hour		10/14/2005	
Nebraska	<a href="#">Contractors' Corner</a> <a href="#">Current Letting Plans</a> <a href="#">On-Line Proposals for Construction</a> <a href="#">Nebraska DOR - Bid Express</a> <a href="#">Approved Products List</a>		X	X	X	Expedite	BE	11/04/2004					X	X	Diskette does not include addenda	10/17/2005	
Nevada	<a href="#">Nevada DOT Contractor and Consultant Information</a> <a href="#">Qualified Product List</a>		X										X			11/03/2005	

**Summary of State Transportation Agency Bidding Information Available on the Internet**

STA	Web Page	Registration Required for Access	Bid Medium				Software		Date of Internet Bidding Implementation	Real-Time Webcasts			Bond Medium		Time Difference Receipt to Reading	Remarks	Last Updated
			Paper	Disk/CD	Internet	Internet Only	Bid Preparation	Internet Bid Submittal		Real-Time Bid Results	Audio WebCast	Video WebCast	Electronic	Paper			
New Hampshire	<a href="#">NHDOT Business Center</a> <a href="#">Qualified Products</a>		X										X		Interested in future implementation of Expedite & Bid Express.	11/29/2005	
New Jersey	<a href="#">NJDOT Current Advertised Projects</a> <a href="#">New Jersey DOT - Bid Express</a> <a href="#">NJDOT Approved Materials</a>	X				X	Expedite	BE	08/23/2005					X		05/15/2006	
New Mexico	<a href="#">Plans, Specifications and Estimates (PS&amp;E) Section</a> <a href="#">New Mexico DOT - Bid Express</a> <a href="#">Approved Products List</a>	X	X	X	X		Expedite	BE	12/01/2002					X		03/29/2006	
New York	<a href="#">Doing Business With NYSDOT - Contractors</a> <a href="#">Materials - Approved List</a>		X	X			Expedite							X	Post-Qualifies Contractors. May replace CHAMP w/ EBO. Seeking mgmt. approval to implement BE.	03/28/2006	
North Carolina	<a href="#">North Carolina DOT - Letting Information</a> <a href="#">North Carolina DOT - Bid Express</a> <a href="#">Approved Products List</a>	X				X	Expedite	BE	11/20/2001		X		X	X		03/28/2006	
North Dakota	<a href="#">NDDOT Bid Opening Information</a> <a href="#">NDDOT Home Page - Bid Express</a> <a href="#">Division of Contract Administration</a>		X	X	X		Expedite	BE	02/11/2005			X		X	NDDOT does not maintain an Approved Products List for construction related materials	11/21/2005	
Ohio	<a href="#">DigitalPaper XE® - Ohio DOT</a> <a href="#">Ohio DOT - Bid Express</a> <a href="#">Certified Producers and Suppliers</a>	X				X	Expedite	BE	09/22/2004				X		Online bidding only - May 11, 2005	11/28/2005	
Oklahoma	<a href="#">OkDOT Contracts &amp; Proposals Information</a> <a href="#">Oklahoma DOT - Bid Express</a> <a href="#">Materials/Sources Index</a>	X	X	X	X		Expedite	BE	04/22/2004		X			X	Webcast at (password required) <a href="http://www.okagchwy.com/">http://www.okagchwy.com/</a>	11/29/2005	
Oregon	<a href="#">ODOT Construction - (Highway &amp; Bridge Contracts)</a> <a href="#">Qualified Products</a>		X											X		12/05/2005	
Pennsylvania	<a href="#">PennDOT ECMS Frameset</a> <a href="#">New Product Evaluation Program</a> <a href="#">Approved Bridge and Structure Products</a>			X	X		ECMS or Expedite	ECMS	01/01/2005					X	Has a number of approved product listings, Bridges, low-volume roads,	03/24/2006	
Puerto Rico	<a href="#">Departamento de Transportación y Obras Públicas</a>		X											X	Web page in Spanish only	07/01/2005	
Rhode Island	<a href="#">RIDOT Current Bid Opportunities</a> <a href="#">RI Dep't of Administration - Division of Purchasing</a>		X	X			Quest							X	Bidder Q&A, Bidding info thru www.purchasing.ri.gov. No QPL found	04/03/2006	
South Carolina	<a href="#">Doing Business with SCDOT - Construction Extranet</a> <a href="#">South Carolina DOT - Bid Express</a> <a href="#">Approval Sheets &amp; Policies for Construction Materials</a>	X				X	Expedite	BE	03/12/2002					X	Some bid tab history on Bid Express, but data incomplete. EE not provided	04/20/2006	
South Dakota	<a href="#">SDDOT / Operations / Bid Letting / EBS Lettings</a> <a href="#">Approved Products List</a>	X				X	SDEBS	USERTrust	01/18/2006				X		Informational copies of electronic plans are available. SD to implement Internet-based system January 2006.	01/17/2006	
Tennessee	<a href="#">Construction Division - Tennessee DOT</a> <a href="#">Tennessee DOT - Bid Express</a> <a href="#">QPL</a>	X	X	X	X		Expedite	BE	06/03/2005					X		04/19/2006	
Texas	<a href="#">TxDOT Contractor Services - Letting Information</a> <a href="#">TxDOT Contractor Services - Plan Information</a> <a href="#">Material Producer List</a>	X	X				Excel Spreadsheet							X	Publishes engineers estimate at advertisement.	04/19/2006	

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			Paper	Disk/CD	Internet	Internet Only	Bid Preparation	Internet Bid Submittal		Real-Time Bid Results	Audio WebCast	Video WebCast	Electronic	Paper			
Utah	<a href="#">UDOT: Bid On Projects Product Listings</a>					X	UDOT EBS	USERTrust	01/07/2003				X		30 min	Only registered users may view structural drawings online.	04/19/2006
Vermont	<a href="#">VAOT - Electronic Bidding</a> <a href="#">Vermont DOT - Bid Express</a> <a href="#">Materials and Research</a>	X	X	X			Expedite	BE	06/06/2003					X			04/18/2006
Virginia	<a href="#">VDOT Business: Construction Division</a> <a href="#">Virginia Department of Transportation: Falcon/SVP</a> <a href="#">Virginia DOT - Bid Express</a> <a href="#">New Products</a>	X				X	Expedite	BE	02/11/2002	X			X	X			03/09/2005
Washington	<a href="#">WSDOT - Contract Ad and Award</a> <a href="#">Builder's Exchange - Washington State DOT</a> <a href="#">QPL</a>		X	X			Ebids							X		EBS Files on CD only	04/17/2006
West Virginia	<a href="#">WV DOT - Lettings</a> <a href="#">Source/Product Listing</a>		X	X			Expedite				X			X			04/05/2006
Wisconsin	<a href="#">Construction - Wisconsin DOT</a> <a href="#">Wisconsin DOT: Home Page - Bid Express</a> <a href="#">Materials Reporting System</a> <a href="#">Erosion Control Products</a>	X	X	X			Expedite	BE	08/26/2002					X		Bid info on secured area of web site	04/04/2006
Wyoming	<a href="#">Wyoming DOT Contractor Information</a> <a href="#">Approved Suppliers</a>		X	X			Expedite						X	X			04/04/2006
		33	49	27	21	12	47	30	29	9	9	5	18	52			

NOTE: Internet bonding by Surety 2000 or Surepath [www.surety2000.com](http://www.surety2000.com)  
[www.insurevision.com](http://www.insurevision.com)

Abbreviations  
 BE = Bid Express  
 EE= Engineer's Estimate  
 EBS=Electronic Bidding System.  
 ALB = Apparent Low Bidder  
 PCC = Portland Cement Concrete