



US Department  
of Transportation

Federal Highway  
Administration

# Memorandum

---

Information: Procurement Information  
for ITS Projects

Date: MAY 01 1997

Associate Administrator for Safety  
and System Applications  
Associate Administrator for Program  
Development

Reply to: HTV-3

Regional Administrators

This memorandum provides information about Federal Highway Administration (FHWA) procurement methods which can be successfully used for Intelligent Transportation Systems (ITS) projects. Through the involvement of your Regional Mobility Specialists, this information has been cooperatively developed by the Office of Traffic Management and ITS Applications and the Office of Engineering. The attached material has been prepared in response to specific questions which have been raised in determining whether a given procurement process is appropriate for a particular ITS project.

This material is an overview of the Federal procurement requirements focusing on the design-build procurement method and it provides information on how the method can be utilized as an effective strategy to develop and deploy ITS infrastructure. Previous FHWA memorandums have encouraged State and local agencies to use and evaluate promising innovative contracting practices under Special Experiment Project number 14 (SEP-14). The intent of SEP-14 is to evaluate innovative contracting techniques which have the potential to improve the quality and efficiency of design and construction projects.

As the deployment of ITS projects continues, the need for additional information on successful procurement procedures is anticipated. Therefore, a subsequent initiative has just started in which representatives from our offices will be working with a group of individuals from the regions and divisions to develop additional procurement information on these case examples. This activity will address these and other procurement options and procedures to ensure compliance with Federal procurement regulations. Furthermore, as a part of the FY 97 ITS Professional Capacity Building program efforts, procurement training is also being developed.

Please share this information with your planning, design, operations, and ITS staff, as well as States, applicable local agencies, and metropolitan planning offices within your area. Should there be questions or comments regarding this memorandum, your ITS specialist may contact the ITS Program Delivery Team member for your region.

Thomas J. Ptak

Dennis C. Judycki

Attachment

FHWA: HTV-3 JOBENBERGER :ctaylor:62221:03/17/97

cc: HOA-3 HSR-1 HPD-1

HST-1 HTV-1(2)

HVH-1 (Lynch) HNG-1 (Eller) HCC-10 HVH-1 (Jones)

HNG-22 (Steinke/Daves/Yakowenko)

HTV-3 (Berman/Rupert/Wilbur/Obenberger)

Reader file Copy, Room 3401/3408

Official file Copy, Room 3408

F:\HTV\PDWEST\CORRES\SEP14DOC.JO

### Do ITS projects need to follow the competitive bidding process for procurement?

Section 112 of Title 23 requires competitive bidding. for all construction contracts. Construction is defined in 23 USC 101 as: . **(bold text added for emphasis)**

- The term “construction” means the supervising, inspecting, actual building, and **all expenses incidental to the construction or reconstruction of a highway**, including bond costs and other costs relating to the issuance in accordance with section 122 of bonds or other debt financing instruments, locating, surveying, and mapping (including the establishment of temporary and permanent geodetic markers in accordance with specifications of the National Oceanic and Atmospheric Administration in the Department of Commerce) resurfacing, restoration, and rehabilitation, acquisition of rights-of-way, relocation assistance, elimination of hazards of railway grade crossings, elimination of roadside obstacles, acquisition of replacement housing sites, acquisition and rehabilitation, relocation, and construction of replacement housing, **and improvements which directly facilitate and control traffic flow**, such as grade separation of intersections, widening of lanes, channelization of **traffic, traffic control systems**, and passenger loading and unloading areas. *The term also includes capital improvements which directly facilitate an effective vehicle weight enforcement program, such as scales (fixed and portable), scale pits, scale installation, and scale houses and also includes costs incurred by the State in performing Federal-aid project related audits which directly benefit the Federal-aid highway program.*

In simple terms, if an ITS project meets the above definition of construction, then the contract should be bid competitively with award to the lowest responsive bidder meeting the specified conditions of responsibility. The procurement procedures in 23 CFR 635 (competitive sealed bidding) should be followed for highway construction contracts and the procedures of 23 CFR 172 (qualifications-based selection) should be followed for engineering service contracts.

Contracts that do not meet the definition of highway construction may be procured by State’s using their own procurement procedures in accordance with 49 CFR 18 (DOT’s implementation of the “Common Rule” for Grant’s and Cooperative Agreements to States and Local Governments) In accordance with 49 CFR 18.36(a), States are to use the same procedures for procuring goods and services with Federal funds that they use for procurement with their own funds. Exceptions to this general rule for FHWA funded highway construction, as defined above, and for engineering and design services related to highway construction are in 49 CFR 18.36(j) and (t), respectively.

## **What type of ITS projects are considered to satisfy the definition of construction?**

Given that the definition of construction includes traffic control systems and other improvements which directly facilitate and control traffic flow, a single broad statement is not sufficient to describe what type of ITS projects do or do not satisfy this definition. References to specific ITS components such as incident management, traffic signal and freeway management systems are even too broad, given this definition. Given the complexity and size of these systems, they are typically developed and implemented incrementally under a number of different projects.

These systems differ greatly in size and complexity resulting in unique ITS projects and contracting approaches to meet the needs and characteristics of each State and local agency. An understanding of the proposed field hardware, system software, communication infrastructure and computer hardware is needed for each project to determine if it meets the definition of construction.

*-Freeway Management and Traffic Signal Systems:* The physical installation of field hardware and devices for these systems would typically be considered as project improvements that meet the definition of construction. Changeable message signs, ramp meters, traffic signals, controller cabinets, lane use control signs and loops are examples of field hardware and devices which would typically be included with projects to implement these systems which could meet the definition of construction. However, the procurement of portable message signs, field device and communication system interfaces, operating system software development and computer hardware, are examples of improvements which individually do not meet the definition of construction.

Communication devices which are wireless or require only limited installation in concept, could be examples of types of improvements which may not meet the definition of construction. A closer evaluation of the actual project is needed to determine if the proposed improvements meet the definition of a construction project. The installation of towers to support wireless communication, direct bury conduit and hardwire interconnect between signals, field devices or systems, are improvements which would meet the definition of construction.

*-Incident Management Systems:* Incident Management Systems typically utilize the information and data generated by the traffic management subsystem functions. The coordination and pre-planned incident management activities such as service patrol, route diversion, \*911 systems, computer aided dispatch systems, radio systems and special events are examples of improvements which would not meet the definition of construction. For example, a project for the installation of the field hardware and devices to provide detection and verification capabilities could meet the definition of construction.

*Other Systems* : Weather and traveler information systems are examples of systems, when implemented as individual contracts, are examples of projects which would not meet the definition of construction.

Specific questions regarding the application of the definition of construction to ITS projects should be directed to the appropriate program delivery team in the Office of Traffic Management and ITS Applications (HTV-3).

### **What type of ITS projects would normally be considered research or planning contracts?**

Early Deployment Planning projects are planning studies and, therefore, considered examples of ITS Program initiatives which would not be included under the definition of hi&way construction. The ITS Program Operational Test projects have been considered an extension of the research program which evaluated the application and performance of technologies in a limited real-world test environment. Some of these tests which utilized the innovative contracting design-build method, were not considered construction activities and did not have to follow the SEP-14 process. The Early Deployment and ITS Program Operational Test projects are generally considered to be research or planning type contracts. A State could use its own procedures to procure the required professional engineering services determined necessary to successfully complete these contracts.

### **What type of ITS projects would normally be considered engineering or design services contracts?**

There are a number of options available for State's to utilize contracts to obtain the engineering services necessary to develop and implement ITS projects. These non-construction projects could involve traditional planning, research, design, traffic management software development, operations, maintenance and evaluation services contracts. Other non-traditional services types of contracts which State's have successfully utilized to assist in developing and implementing ITS projects have involved retaining a system integrator and/or a system manager.

The responsibilities of a system integrator typically involve the integration of the traffic management system software with the traffic monitoring and control equipment required for a particular system. The traffic management system software also involves the development of all central facility software along with the selection, procurement, configuration and installation of all hardware needed to provide the functionality of whatever system is being implemented. The integrator is usually required to also specify, procure, install, integrate; and test the central computer system and related field hardware to provide the required functionality. This is to ensure that the software, traffic monitoring and control equipment development work is coordinated with the other related concurrent system development work that other contractors may be performing related to installing field equipment, communications infrastructure and

traffic control center equipment.

States have contracted to retain a system manager to work on behalf of and in coordination with that particular agency on particular ITS projects which are being developed. This type of contract typically provides professional staff with special skills and experience and/or the resources that a particular State may not have to successfully facilitate the completion of a particular ITS project. The system manager would then work directly with the system integrator or contractors on different contracts to complete the development or implementation of the ITS projects. If the system manager/system integrator concept involves the procurement of an ITS system which meets the definition of construction, the SEP-14 process must be followed to obtain approval of the design-build procurement method specified for the particular project.

### **Why must the States obtain FHWA's concept approval for the use of the Design-Build process?**

As noted above, FHWA's statutes require that highway construction contracts be awarded competitively to the lowest responsible bidder. A State must use competitive bidding procedures, unless it demonstrates that some other method is more cost effective or an emergency exists. Also, the Brooks Act requires qualifications based selection procedures for engineering service contracts. The procurement of design and construction services under one contract does not fully comply with existing statutes and regulations.

In April 1991, FHWA's Office of Chief Counsel reviewed the design-build concept for compatibility with current Federal laws and regulations. It is their position that Federal-aid funds may participate in design-build contracts when approved by FHWA as an experimental project under SEP-14 and awarded using competitive bidding procedures.

FHWA will consider requests for various types of design-build projects as long as they incorporate some form of competitive bidding in the award process. Some States have awarded design-build contracts on the basis of low bid, while other states have considered cost as well as quality factors, time of completion and other criteria in the award process. While FHWA has not defined the weighting criteria for cost in a State's award procedures, a State must utilize cost as one of the award criteria in order to have a competitive process under SEP-14.

### **Is advanced concept approval necessary for design-build projects?**

Yes, if the proposed projects meet the definition of a construction project, FHWA approval through SEP-14 process is required. The contracting agency should request FHWA's concept approval, as an SEP-14 project, for proposed improvements on the NHS or non-NHS system prior to proceeding with a design-build contract. This request should be made by the agency and

approval, as an SEP-14 project, for proposed improvements on the NHS or non-NHS system prior to proceeding with a design-build contract. This request should be made by the agency and coordinated with the division office as soon as design-build has been selected as the desired procurement method in the project development process. This early submittal is encouraged to allow any review comments from FHWA division, region or headquarters to be included in the appropriate design documents and project procurement documents.

This will also ensure that the procurement schedule will not be impacted and unexpected delays avoided by the approval process. The contracting agency should submit a work plan which includes a brief description of the project and an evaluation plan of the proposed criteria to be used in the contract selection and award process. A guide for preparing SEP-14 work plans is attached.

### **Does “Low Bid” necessarily equate to low quality?**

While 23 USC 112 requires construction projects to be awarded only on the basis of the lowest responsive bid, this does not prohibit a contracting agency from prequalifying potential bidders. Many states have an effective prequalification system. States should also consider prequalification when procuring ITS components. When prequalifying firms for ITS work, a contracting agency may use additional technical criteria such as past experience with a certain type of installation or technical expertise or capacity in a particular installation.

For design-build projects, prequalification criteria should be incorporated into the procurement selection procedures. The identification of prequalification criteria for ITS projects is an important item which should also be included, when the project is a part of a larger roadway construction project.

### **What items must be included as selection criteria in the award of a design-build project?**

While there is no prescribed method for specifying the award criteria in design-build procurement documents, FHWA has told various industry groups that cost will be a factor in all SEP-14 design-build projects. In the early 1990's, numerous highway industry associations and congressional representatives were assured that FHWA was not seeking alternatives to open competitive bidding. Each of the innovative contracting techniques acceptable under SEP-14 guidelines lends itself to competitive bidding. All of the SEP-14 techniques that have been evaluated to date, have incorporated contract time or quality considerations in the determination and selection of the low bid. While many states have used a variety of variables to quantify quality in the ranking criteria and selection process, cost must also be one of the criteria in the design-build selection process.

Low Bid- Under current state law, New Jersey DOT must award contracts to the lowest responsible bidder and qualitative factors may not be considered. (Note: this is not recommended by most proponents of the design-build concept.)

Adjusted Bid - North Carolina DOT used the design-build concept for a Congestion Avoidance and Reduction for Automobiles and Trucks (CARAT) project in Charlotte. This design-build project will provide for a freeway traffic management system on I-77 in Charlotte. The procurement process was based on an adjusted bid concept with a qualitative composite scoring formula:

$$\text{Engineer's Estimate} \times \left\{ \left( \frac{\text{Actual cost}}{\text{Engineer's Estimate}} \right) \times \text{cost weight} \right\} + \left\{ \frac{\text{high score}}{\text{actual score}} \times (1 - \text{cost weight}) \right\}$$

The proposal was written to give NC DOT the option to proceed with the construction of additional components to the system depending on the bids that were submitted. The cost weights for each component are:

- 
- Base System ( Construction of a Traffic Operations Center) 33%
- Off-Freeway Surveillance System 60%
- Changeable Message Signs 60%
- Weigh-in-motion system 60%
- Air Quality monitoring system 60%
- Truck Rollover Advisory system 60%

Highest Composite Score: South Carolina DOT is currently proceeding with two bridge replacement design-build contracts and is considering the design-build method on several more projects.

South Carolina's design-build methodology utilized the highest composite score (combination of cost and qualifications) to select the successful proposer. The following criteria were used in the selection process on Enoree River/Reedy Creek project:

- Cost of the project - 55%
- Qualifications of the proposer- 25%
- Time of Completion - 20%

Best Value: Utah DOT has developed a design-build project to rebuild the I-15 corridor through the Salt Lake area prior to the 2002 Olympics. It is believed that the use of the design-build procedure will save approximately three years in the completion of this project. The 26 km corridor project includes the replacement of 125 structures, 10 new structures at existing and new interchanges and an area-wide traffic management system. UDOT utilized a "best value" approach to award this project with cost and other considerations included in the selection process.



**Best Value/Fixed Budget** : UDOT has developed a \$ 1.5 million design-build project to design, furnish and install an interim area-wide traffic operations center to provide initially limited freeway surveillance and traveler information infrastructure on the freeway corridors in the Salt Lake City area. This design-build contract will utilize a procurement selection technique known as “best value - fixed budget” to select the successful offerer. The offerers will be rated on specific criteria and the successful contractor will be selected based on maximum technical score. This technique will attempt to maximize the initial functionality and infrastructure of the system using the entire budget that is available.

INNOVATIVE CONTRACTING PRACTICES  
SPECIAL EXPERIMENTAL PROJECT NO. 14

Innovative contracting practices, proposed to be evaluated under Special Experimental Project No. 14 (SEP 14) must be submitted, by the FHWA division office through the regional office, to Headquarters (HNG-22) for approval. Review comments and recommendations made by the division and by the region should accompany the proposal. Submittals should be made early in the development of the project(s) in order that Headquarter's review comments can be incorporated in the project design and/or documents.

The basic component of an SEP 14 proposal should be a work plan which includes a brief description of the innovation to be evaluated and a proposed evaluation plan. It is recommended that draft special provisions, pertinent to the innovative practice, also be included if available at the time of the submission. The following items should be addressed in the work plan:

Purpose: A brief description of the innovation which is to be evaluated and the expected results.

Scope: A brief discussion as to how the experiment will be conducted, including the number of project(s), a description of the location, existing conditions, etc.

Schedule: An approximate, schedule for the project(s) including: advertisement, letting, award, project completion, and evaluations and reports.

Measures: A brief description of how the innovation is going to be evaluated (i.e., cost savings, time savings, improved quality, etc.).

Reporting: Both an initial and a final report should be prepared for all projects. The need for an intermediate report should be determined based on the complexity of the experiment and the length of time between completion of the work and completion of the experiment. All reports should be forwarded to Headquarters (HNG-22).

The initial report should be prepared approximately at the time of project award and should discuss any industry reaction to the innovation and any identifiable effects on the bids received. A copy of the bid tabulations should be included.

Intermediate reports should be prepared upon completion of the work and/or periodically until completion of the experiment. These reports should discuss the effects on work performance and monitoring, quality, completion time, claims, and other contract administration or legal issues.

The final report should be prepared upon completion of the experiment and should contain an overall evaluation of the innovation. Suggestions for improvements, pitfalls to avoid and a recommendation as to further use of the innovation should be included in the final report.