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# Use of Contract Services by State DOTs

KENNETH E. COOK

## Pressures To Contract Out Government Services

Both the U.S. Congress and the state legislatures have approved substantial increases in highway funds. The expanded state transportation programs that have resulted from the increased availability of highway funds are being accomplished through the greater use of private contractor and consultant services.

State highway agencies have a long history of using contractors to construct new facilities or to reconstruct and expand existing roads and highways. The cyclical nature of highway projects, along with their size, location, and characteristics, has made it inefficient for states to maintain the needed construction crews and equipment. From the beginning state transportation agencies have made limited use of "force-account" construction activities using their own employees.

In contrast to the common practice of contracting out construction activities, in which materials and performance are comparatively easy to define, schedule, and measure, most states have limited the contracting out of maintenance and operations activities. In addition, the U.S. Congress has been reluctant to provide federal-aid funds for maintenance and operations because it is difficult to measure performance and cost-effectiveness.

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nance and operations because it is difficult to measure performance and cost-effectiveness.

However, faced with larger construction and maintenance programs, combined with an inability to substantially increase the number of state transportation employees, state departments of transportation are turning to private contractors to perform engineering, maintenance operations, and even management functions, in addition to the traditionally contracted construction activities.

## Activities Contracted Out by the States

To determine the extent of the use of contractors and consultants to perform

state highway activities, the Transportation Research Board surveyed the states in the summer of 1984. More than 40 state transportation agencies responded. The replies indicate that every major activity relating to preconstruction and project development, planning, construction, traffic, safety, operations and maintenance, and administration is being contracted out by at least one state.

In the areas of preconstruction and project development, most of the state agencies use contractors for part of their work in location and surveys, environmental analysis, and geotechnical and right-of-way appraisal and acquisition. Although the range is 72 to 89 percent for that portion of the activities that is contracted out, no state contracts out any one of these activities in its entirety. Two-thirds of the states contract out photogrammetry and mapping activities, and eight states report that none of this work is accomplished internally.

In most state transportation agencies, planning activities have been curtailed, and the proportion of studies contracted out was reported to be less than half except for rail, air, and waterway planning studies. Only about one-third of the states let contracts for comprehensive planning studies, impact studies, traffic counts, or transit studies.

In construction, more than one-half of the states contract out, in part, project inspection and materials testing. Forty-two percent let contracts, in part, for

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project management and supervision, and two-thirds of the states use contractors for roadside development and landscaping. Based on the responses, it appears that some states let total "turn-key" contracts using private contractors to design and manage the entire construction and inspection of projects.

Most states do their own traffic and operations studies. Only 22 percent contract out any traffic counts, and only one-third use contractors for TSM studies. In contrast, because of the requirement for specialized crews and equipment, almost 80 percent use contractors for lighting, sign, and signal installations; a substantial number of states do not have in-house crews to do such work. However, two-thirds of the states maintain their traffic-control devices, and only one-third contracts out part of the maintenance.

Most states do not contract out a significant number of administrative activities, although about one-third do use outside contractors to perform management audits and to provide data-processing services. Not surprisingly, three-fourths of the state transportation agencies utilize outside sources to provide training programs.

#### **Contracting for Maintenance Activities**

The TRB survey did not include an analysis of state highway maintenance activities because a separate study was conducted under the National Coopera-

tive Highway Research Program on the contracting out of maintenance. The NCHRP study, which will be published as a *Synthesis* report in the near future, has found that at least one state contracts out each of 35 maintenance activities that were listed on the survey. The reasons given for the use of contractor services and the methods of and the problems with contracting out do not differ significantly from those found in our survey of other state DOT activities.

#### **Reasons for Using Contractor Services**

No general pattern emerged from the survey responses regarding activities for which state agencies use contractors. Some states indicated extensive use of contracting in all areas; some indicated they are extremely restrictive in their use of services outside of the agency. Although the greatest use of contractors is in design and construction, it is evident that maintenance, traffic and operations, planning, and safety activities are increasingly being let to private contractors.

The main reasons given by the states for the use of contractors, in the order of their importance, are:

1. To respond to increased or peak work loads without increasing the number of staff.
2. To obtain specially trained professionals and specialized equipment.

3. To replace mandated staff reductions.

4. To make use of all available funds.

5. To reduce costs.

6. To provide opportunities for private contractors.

7. To improve agency credibility with the public and to respond to the desire for less government.

Problems associated with the recruitment of state personnel and the prohibitions against contracting out because of union contracts were noted as not being significant.

The two most common responses by the states to the survey query on what factors prevent or impede the use of contractors were: (a) adequate in-house staff, and (b) concern that the contractors might not perform the required activities adequately or when needed. Other replies included: (a) the savings were not sufficient to warrant contracting out, and (b) there was no way to adequately specify the work to be done or to measure the quality or quantity of the contractor's work.

The lack of available contractors, potential bid rigging, contractor torts and negligence, the costs of the bidding process, and the supervision of contractors do not appear to be major reasons for not using contractor services. Because most states make provisions in contracts to deal with emergency situations or have state forces available if needed, in most cases



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the inability of contractors to handle emergencies did not appear to be a substantial concern. No pattern emerged among the states regarding the activities that are routinely not let to private contractors or consultants.

### **Problems Encountered in the Use of Contractors**

A number of common problems related to the use of contractors and consultants were reported by the states. First, a loss of direct control over the activity was frequently indicated. Performing the job with state forces gives the department direct control over manpower, materials, and timing of activities. The use of contractors can result in conflicts between the contractors and the department over the priority of activities. The major recourse has been to assess liquidated damages if the work is not completed by the specified date. When contractors are used, the ability to change schedules and alter work plans is limited.

The second major problem voiced was that the contracting-out process takes too long and therefore it is difficult to get jobs started and completed on schedule. Additional time is required to develop a request for a proposal and to award the contract. More time is needed for the contractor to schedule the job along with his other work and to handle change orders because of contract requirements that do not apply when state forces are employed.

The survey respondents expressed their uncertainty about the quality of work delivered by the contractor. Also mentioned were problems in auditing the actual labor and materials used by a contractor in a project. It was reported that projects are frequently delayed because it is necessary for the agency to

educate and train the contractor's employees before they are sufficiently competent to perform the contracted activities. Other problems indicated in the responses to the survey are:

- Disputes arise regarding contract interpretation.
- Changes in the contract are costly.
- Federal and state requirements for contractor selection and contract administration are too complex.
- It is difficult to get contractors to correct problems after they have been paid.
- The contractor's profit orientation may impede performance quality.
- Contractors may not have sufficient personnel, equipment, and incentive to meet specifications and required performance.
- Overhead charges and salary ranges are high compared with those of state DOTs.
- Lack of adequate scoping and definition of work at the outset results in numerous supplemental agreements.
- There is the danger of selecting "favored" contractors when bids are not solely based on price, and the danger of poor performance quality when the lowest bid price is the sole criterion.

### **Legal Problems Arising From Contracting for Services**

Two legal issues have surfaced in many states regarding the use of contractors to perform services. The first issue is state liability for torts, negligence, and non-performance by the contractors. The states attempt to avoid such liability by including in all contracts a "hold harmless clause" under which the state will not be held liable for the actions of the contractor and the contractor will have to defend his actions at his own cost. In addition, contractors are required to carry public liability and property damage insurance. Despite both devices, many lawsuits, using the "deep packets" theory, name the states as codefendants in legal actions against the contractors, and, in some cases, the states have been ordered to pay judgments in excess of the contractor's ability to pay. When the issue is nonperformance, the state DOT will generally have the contract completed by another contractor or by state forces, and the primary contractor will be billed for damages.

The second legal problem arises in the use of contractors to perform jobs that were formerly performed by state forces or could reasonably be performed by state forces. Collective-bargaining agreements may prevent contracting out in such instances if the practice results in laying off state personnel or prevents laid-off employees from being recalled. Such agreements prevent using the threat of contracting out as leverage in bargaining.

### **Handling Emergency Situations**

Although most activities that are contracted out are not the type that might jeopardize the public health, safety, or welfare, contract provisions set forth the methods by which emergency con-



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tingencies will be handled. Usually emergencies are met by the state issuing extra work orders and supplemental agreements. However, when there is a danger to the driving public, state forces, which can be expeditiously dispatched, may be called on. In such cases, the contractor will be billed for such services. By establishing strict contractor prequalification procedures for bidders on contracts, the state DOTs attempt to prevent emergencies that result from noncompliance by the contractor.

### **Pricing, Measures of Performance, and Penalties**

The decision on the form of pricing to be used for contract services depends on the type of work to be performed. When the units of performance can be easily measured, unit price or hourly rates are most often used. When it is difficult to identify work units and quality of performance, lump-sum and cost-plus pricing are used, or contracts may be set at a fixed price and include a detailed expense system by which the contractor is paid for direct labor, fringe benefits, overhead, and profit. Actual material costs are paid and equipment rental is set at a specified price. Even gross income taxes for the contractors are sometimes included as reimbursable costs. When performance units are not available, state DOTs hold meetings and training programs for contractors to provide them with a clear understanding of the procedures and the contract specifications. Many contracts require final inspection and acceptance by the state before payment. If the activity does not meet the requirements, the contractors must do the work again or accept a lower price based on poor quality of performance.

The states employ a number of procedures to prevent poor performance or nonperformance of work before or after the contract has been completed or while the work is being carried out. Before contracts are let, many states require a screening process and approval of bidders. The past performance of the bidders is reviewed, and those with poor performance records are eliminated from the bidding. Positive incentives for quality work and timely performance are provided by bonuses stipulated in the contracts.

Some of the states use review committees that monitor progress of the work and meet with the contractor when necessary. Contractors are graded on performance; many contracts provide for termination rights by the state should the contractor fail to fulfill his obligations.

Most contractors include a liquidated-damages provision for failure to meet time schedules. In some cases, the contractor may be assessed 5 percent of the total contract amount for each late day. In addition, performance bonds may be required whereby the bondsman is responsible for fulfilling the obligations of the contract should the contractor fail to do so. Most contracts also provide for holding a "set-off" or "retainage," which is a portion of the contract funds, until the project is accepted by the agency. Contracts may also provide for back charges for errors and deficiencies and graduated penalties for or reconstruction of unacceptable work.

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### **Bidding and Contractor Supervision**

According to the survey responses, the state DOTs are divided with respect to the use of prequalification requirements for contractors and permitting contractors to bid alternatives to the specifications set forth in the requests for proposals. Most prequalification requirements are related to construction contracts to ensure that the contractor has the personnel, the equipment, and the financial resources necessary to perform the contract. Prequalification lists are also used to exclude bidders with whom the department has had contract problems in the past. Prequalification is generally not required for service and consultant contractors, although most states maintain a list of contractors that are interested in such contracts.

Most of the states do not have a formal process for permitting the contractors to bid alternative materials, methods, and processes in proposals. A few states include a value-engineering provision in their requests for proposals or specify acceptable alternative specifications. A separate list of bid items for each alternative is provided and the alternatives may include a life-cycle cost analysis.

Consultant and service contracts that do not have readily measurable performance units are generally negotiated rather than awarded on the basis of lowest bid price. Such service contracts are based on the ability and the past performance of a bidder and the price is either fixed or negotiated.

Few states employ a formal process for evaluating the possibility of collusion between bidders. Four or five DOTs use the Federal Highway Administration's Bid Analysis Management System computer software package. Many contracts include a noncollusion affidavit.



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Cost estimates for construction and maintenance bids are always evaluated by DOT staffs. Cost estimates and parameters are established before the bid opening. Bids in excess of or below the parameters are given close scrutiny, and individual bidders or all bids may be rejected.

In awarding noncompetitive consultant and service contracts, there is always the danger of favoritism. Some of the states set up committees to award service contracts with the expectation that a committee will be less biased than an individual.

The state agencies can experience control over the contractor: (a) at the bid and contract-award stage; (b) during performance of the contract; and (c) after completion of the contract. The agencies inspect and monitor the contractor's performance and the quality and quantity of materials that are used. Project engineers and inspector technicians monitor all phases of the contractor's activity. In addition, the contractor is required to submit periodic performance reports. Consultant and other service contracts also are monitored by agency staff.

Contracts include provisions for warranties regarding performance and durability of the product, which are subject to final inspection and acceptance before the hold-back funds are paid. Bid, performance, and payment bonds are used to ensure that the contractor will fulfill his obligations. Equipment warranties, insurance against bankruptcy, and contractor guarantees regarding future work performance are techniques used by the states to assure the quality of the product after the contract has been completed.

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### **Use of Cost Comparisons**

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The responses to the survey query on cost comparisons indicated that more than two-thirds of the states do not use or only occasionally use cost comparisons of the use of state forces and the use of contractors to perform work. The two principal reasons given for not doing so are (a) cost is not a major factor in contracting out and (b) the cost data for internal operations, especially overhead charges, are not sufficiently accurate to permit meaningful comparisons. When cost comparisons are used, they are primarily direct labor comparisons used to justify labor or overtime. Cost comparisons are more common for construction, maintenance, and materials testing activities and less common for bridge design, planning, and traffic operations. Cost comparisons include those on direct labor, fringe benefits, and equipment rental charges. Overhead, utilities, insurance, support services, and capital depreciation are generally not included.

Contractor costs are compared on the basis of bid price or on labor, material, and overhead costs. Bid management, supervision and inspection of the contractor's work by state forces, and overhead costs not eliminated by contracting out the activity are generally not included in cost comparisons.

### **Contracting for Peak Work Loads and Special Capabilities**

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During the past decade, state departments of transportation have had to reduce the size of their staffs. Now, even

though increased federal-aid and state revenues have been made available for transportation programs, the departments are taking a conservative approach toward increasing the size of their staffs.

Most of the responding state DOTs indicated that they are satisfied with maintaining in-house staffing at current levels. They recognize that special skill and knowledge disciplines might be handled better by consultants than by in-house staff, who could not be fully utilized because of limited career progression. The use of consultants was also seen as desirable in handling peak work loads instead of increasing and then having to reduce the size of state staffs.

Concern was expressed by the respondents over using contractors to replace state employees to reduce the total number of DOT staff. Concern was voiced that the increased use of consultants might also result in the loss of staff engineering and design skills and that the staff would become planning and management oriented, depending on consultants for technical services.

There was also concern that if contractors replaced state employees, the ability of the department to respond to emergency and quick turnaround projects would be severely limited. With fewer state employees, department operations would have to be better planned and more orderly executed. But this would also result in less flexibility.

Skepticism was indicated by the responding states on whether expanding the contracting out of services would be more efficient and lower the costs of services. A substantially expanded need for supervision of contractors and con-



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sultants would result, and bid-management costs, bonding expenses, profits, and taxes would have to be included as part of the contracting costs. Because contractors are not equally competent, there could be increased inconsistency in the quality and levels of service on different segments of the system. Also, because the contractor most likely has other contracts, the project priorities of the contractor may not be the same as those of the state. Sequencing and coordination of multiple projects within a system would become increasingly difficult.

### **Summary of Findings**

The use of contractors to perform state transportation construction, operation, and maintenance activities has increased. The expansion of these services has resulted from political pressures to reduce the number of government em-

ployees as well as an increase in available resources for rebuilding and rehabilitating a deteriorating transportation infrastructure. Almost every type of activity, with the exception of policy formulation and management decision making, is being, at least in part, contracted out by one or more states.

In the past, contracting of services has been used to meet peak work loads, to secure special services, and to make use of available resources. Cost reduction has not played a major role, and thus accurate cost comparisons of state and contractor costs are not available. Whether a state DOT contracts out an activity is closely related to the in-

stitutional history and local constraints. There is no discernible national pattern of which activities might be done better by contractors than by in-house staff.

The responses by the states to TRB's survey indicate that a complex and thorough process is needed for the contracting of services. The controls for contracted-out projects have to be much more stringent than those for in-house projects because of the separate and arms-length management position used with the contractor compared to a management continuum of staff activities.

Convenience and necessity have dictated the use of contractors and consultants by state transportation agencies. Officials expect that unless there are major political decisions to the contrary, the current level of state employees will remain relatively constant, and consultants and contractors will continue to be used as they have been in the past.

### **CALL FOR ARTICLES**

Professionals in the transportation field are invited to submit to the Editor of *TRNews* topical articles on innovative or state-of-the-art aspects of the various modes of transportation. Articles that highlight the role played by research are especially desired. Feature articles should be 1,500 to 3,000 words in length and accompanied by appropriate, high-quality illustrations.

Letters to the Editor are encouraged that offer commentary on feature articles or responses to point-of-view articles, or in general discuss issues

related to transportation research or to TRB activities. Comments are also welcome on the changes that have been taking place in format, design, and contents, since the change in editorship of *TRNews* beginning with the January-February 1984 issue.

All articles and letters received will be reviewed by the Editorial Board of *TRNews* for suitability for publication. For further guidelines, see Information for Contributors on the inside back cover.

—Nancy A. Ackerman, Editor