



Secretary of State Audit Report

Department of Transportation: Engineering Services Cost Analysis

Summary

PURPOSE

The purpose of our audit was to determine if the Department of Transportation's (department) methods of obtaining design engineering services for projects has resulted in the lowest possible cost to the state. We shared our findings and recommendations with the department after we completed our initial fieldwork. Subsequently, we performed additional fieldwork to assess the department's progress, within its restructured contracting process, to address the issues we identified. This report will serve to summarize our initial audit results and findings, as well as to report on what the agency has done to address these areas of concern.

BACKGROUND

The national trend in design engineering for highway projects shows an increased use of private sector design engineer consultants. This trend has also occurred in Oregon, where recent legislation has dramatically increased the department's need for consultants to meet design engineering demand.

The Oregon Transportation Investment Act (OTIA) passed by the legislature in 2001, added \$500 million to the department's budget for road construction projects. In 2003, the legislature added an additional \$2.5 billion to fund OTIA projects. According to the department, \$700 million of the \$3 billion total will be spent on design engineering services. However, the department did not receive funding for additional in-house engineering capacity.

RESULTS IN BRIEF

We found the department neither aggressively negotiated price with consultants, nor did it have the cost information necessary to establish strong negotiating positions.

When we compared consultant and departmental design engineering costs for a variety of projects, we found in-house design engineering services were about 20 percent less expensive.

Further, the department was losing engineering expertise at an alarming rate.

Our follow-up found that although department management demonstrated an awareness of the improvements needed, actual implementation of negotiation and evaluation process improvements has been slow.

RECOMMENDATIONS

We recommend the Department of Transportation implement the necessary processes to ensure negotiation of best price, including the following:

- Implementation of processes to ensure evaluation of consultant overhead and direct labor, and negotiation of contract price.
- Designation of sufficient staff to review and analyze consultant labor and overhead rates, and to prepare cost estimates.
- Modify information gathering and reporting systems to capture cost information in categories necessary for the negotiation of best price.

AGENCY'S RESPONSE

The Department of Transportation agrees with the recommendations. The department's response to the recommendations begins on page 8.

Background

Out-sourcing of Highway Design Engineering a National Trend

The national trend in design engineering for highway projects shows an increased use of private sector design engineer consultants.¹ We surveyed 16 state transportation departments and found that 12 had increased their use of consultants over the last five years. State transportation officials cited peak workloads and consultant expertise as the most common reasons to use consultants, while noting higher costs and potential fraud as the most common areas of concern.

Legislation Results in Increased Reliance on Consultants in Oregon

Recent legislation has dramatically increased the department's need for consultants to meet design engineering demand. The Oregon Transportation Investment Act (OTIA), passed by the legislature in 2001, added \$500 million to the department's budget for road construction projects. In 2003, the legislature added an additional \$2.5 billion to fund OTIA projects. According to the department, \$700 million of the \$3 billion total will be spent on design engineering services. However, this package did not provide funding for additional in-house engineering capacity.

Department Restructures to Align With Increased Consultant Use

The department is restructuring its internal processes to align with

¹ Design engineers provide the plans for the construction of highway projects. There are a number of design engineering specialties, each employed according to the planning requirements for the project.

the increased use of engineering consultants. This reorganization is ongoing and the affected processes are still in a state of change.

Traditionally, engineers in the department's Technical Services Branch were responsible for contract administration of outsourced design work, and for in-house design. While this arrangement worked for a smaller level of outsourcing, the department found it was not conducive for outsourcing on a massive scale.

In response to this shift towards out-sourcing, the department re-located its in-house design engineering function out to departmental regions around the state. A new unit, the Alternative Delivery Unit, was created to provide contract administration services, including price negotiation and evaluation of consultant proposals for design engineering contracts.

Audit Results

The purpose of our audit was to determine if the department's methods of obtaining design engineering services for projects has resulted in the lowest possible cost to the state.

We determined the department's contracting practices did not ensure the lowest possible cost to the state for design engineering services. We found the department could more aggressively negotiate to ensure a fair and reasonable price. We also found the department did not have the information necessary to establish strong negotiation positions.

We further found that as a result of the shift in emphasis to a primarily contracted service delivery model the department was losing engineering expertise at an alarming rate. A core-engineering competency is needed to monitor consultants and make informed

decisions regarding quality and price.

We compared consultant and departmental design engineering costs for a variety of projects. Our testing showed in-house design engineering services were about 20 percent less expensive than consultants for the 12 cost comparisons we performed.

More Aggressive Negotiation Needed

Federal regulations require the department initially select consultants based on quality. However, the same regulations require negotiation of price to ensure a "fair and reasonable" price was obtained. Similarly, state laws require that compensation paid to consultants be reasonable and fair.²

Even though profit, direct labor rates, estimated staff hours and type of staff, some consultant overhead rates, and total price can and should be negotiated, we found through our contract file review and staff interviews little evidence that negotiation had occurred. In fact, we typically noted evidence to the contrary, such as:

- "Not to exceed" contract dollar amounts that matched the estimated project dollar amount furnished by the consultant;
- A near standardized 10.5 percent profit fee that was awarded on contracts;
- Limited documentation to indicate overhead and direct labor rates were evaluated and negotiated when allowed; and
- Limited documentation to support the department's use of cost estimates, or full cost information, in contract negotiations of project price.

² ORS Chapter 279.057 (6)

“Not to Exceed” Contract Amounts Matched Contractor Estimates

We reviewed files for work order contracts granted under five different Agreement to Agree contracts.³ We noted the “not to exceed” dollar amount on the contracts matched the amount on the “Summary of Estimate of Services” furnished by the consultants. We also did not find any evidence in the contract files to suggest negotiation of a maximum price had occurred.

Standardized 10.5 Percent Profit Fee Used

The department was criticized by the Federal Highway Department for not negotiating the profit fee on consultant contracts. When we tested the contracts we used in our cost comparisons, we found the prime contractor for 10 of these 12 work order contracts received a 10.5 percent profit figure.

Evaluation and Negotiation of Direct Labor and Overhead Rates Could Be Improved

The rates used to reimburse consultants for direct labor and overhead were critical factors in determining the total project price. Direct labor and overhead rates influenced more than 82 percent of the total project price for the work order contracts in the cost comparisons we performed. These rates were established in the Agreement to Agree contracts and were applied to every direct labor hour worked on the projects.

³ The department enters into both Agreement to Agree (ATA) and work-order contracts. ATA contracts set the rates, such as salary, overhead, and profit that will be paid to a consultant under a work order contract. A work order contract is entered into once a specific project is identified.

However, we found little evidence the department evaluated or negotiated consultant direct labor rates.

In addition, federal regulations require the department accept an overhead rate audited by another government entity, or by a Certified Public Accountant in accordance with federal standards. If an audit has not been performed, federal guidelines recommend that states evaluate and negotiate the overhead rate.

We found little evidence to consistently demonstrate the department either accepted an audited rate, or evaluated and negotiated an overhead rate with the consultant. Only one of the four consultants whose Agreement to Agree contract files we reviewed had documentation to assure us the department had accepted an audited overhead rate. The contract files of the other three consultants contained inadequate documentation to support that a department-accepted, audited overhead rate was used, or that an overhead rate was evaluated and negotiated with the consultant.

Department staff also told us they were behind in performing evaluations of consultant overhead rates. One department document we reviewed contained a footnote stating the department had completed only three of the 17 audits of consultant overhead rates the department identified as needing to be done.

In summary, department employees responsible for negotiating the Agreement to Agree contracts did not have the direct labor and overhead rate evaluations needed to assist them in the negotiation process.

Cost Estimates and Cost Information Needed

Federal regulations require government agencies prepare and

provide cost estimates to the contracting officer before commencing negotiations. These regulations apply to each proposed contract or contract modification expected to exceed \$100,000.

The National State Auditors Association’s recommended practices for contracting stress the importance of cost information when comparing in-house and contracted services. These recommended practices include preparation of cost/benefit analyses to determine if contracting for services is more or less expensive than using agency staff.

Full cost information, which includes all department costs to prepare, negotiate, and monitor contracts, can be used to estimate the cost of contracting a project. This information would be useful when comparing in-house cost estimates to consultant proposed costs. Such comparisons would strengthen the department’s negotiating position.

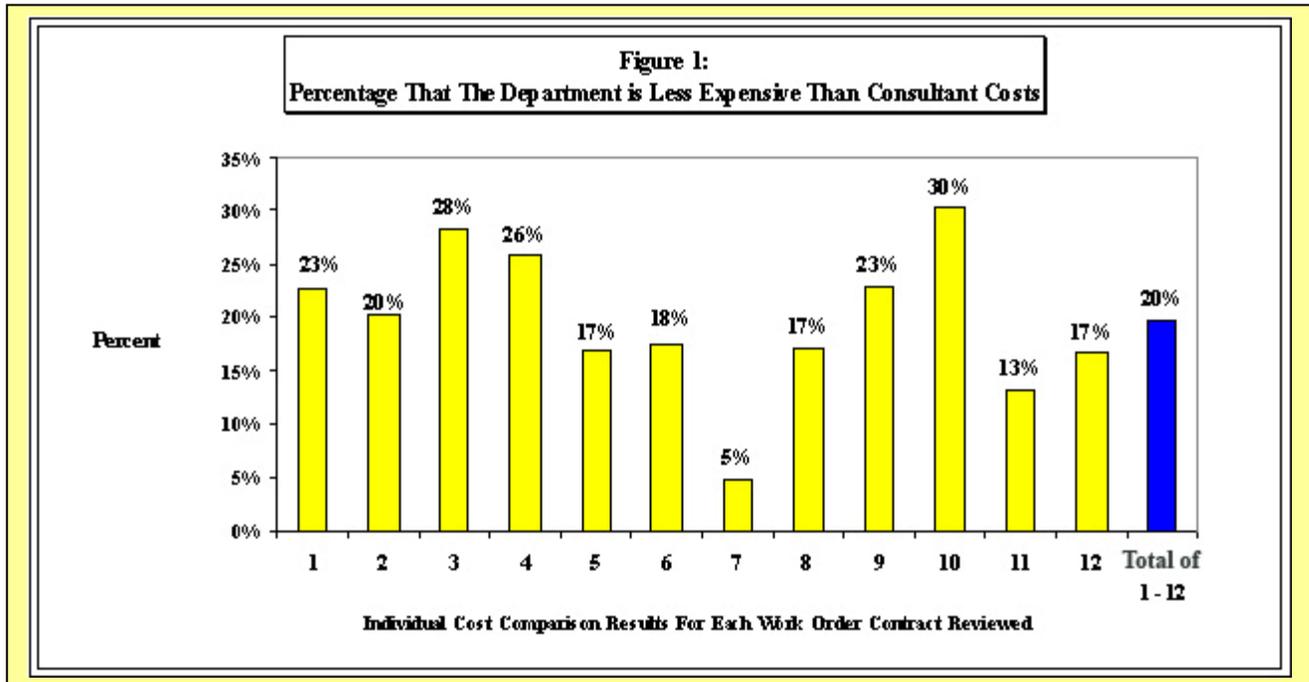
During our file review of the work order contracts relating to five Agreement to Agree contracts, we found no evidence that in-house cost estimates and full cost information related to contracting were prepared or used to negotiate contract prices.

Cost Comparisons Indicate Consultants Were 20 Percent More Expensive

For the period of our review (July of 2000 to June of 2003), the department entered into approximately 400 design engineering work order contracts with a value of approximately \$54 million. For 12 of these contracts, we compared consultant paid invoices to estimated in-house costs and concluded consultant costs were approximately 20 percent (\$284,000) higher. The consultant invoices we reviewed totaled approximately \$1.4 million.

As shown in Figure 1, cost differences varied by work order contract, ranging from a low of

approximately 5 percent to a high of about 30 percent.



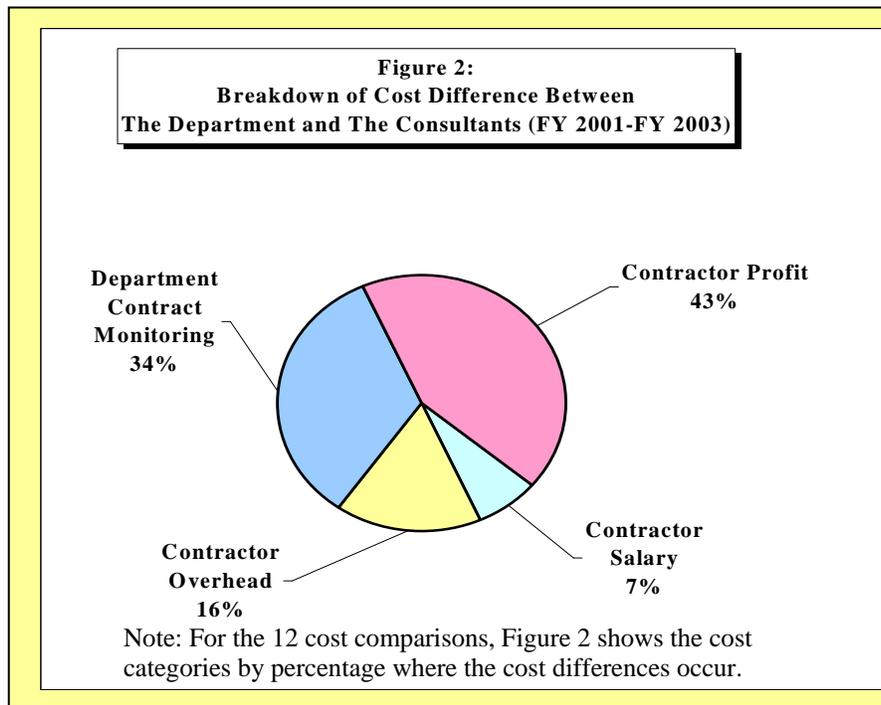
Note: For each of the 12 comparisons performed, the department would have been the less expensive option.

Cost Difference Breakdown

As shown in Figure 2, contractor profit comprised approximately 43 percent of the cost difference we found between in-house and contracted services. The department's contract monitoring costs, higher contractor salaries, and higher contractor overhead costs accounted for the remaining 57 percent.

Contract monitoring amounted to approximately 34 percent of the overall cost difference. The purpose of contract monitoring is to ensure consultants comply with contract terms.

Differences in salaries and overhead made up 23 percent of the cost difference. Indirect labor and expenses, such as medical and retirement plans, holiday pay, training, facilities, and supplies, made up consultant overhead.



Change in Emphasis Impacts Improvement Needs

The areas we identified as needing improvement are further impacted by the shift from the department's historical emphasis on in-house delivery of engineering services to the greater use of outsourcing.

In response to this changing environment requiring increased use of contracting, we found the department did not have the processes in place to ensure negotiation of best price.

In following up our initial fieldwork, we found that implementation of the processes needed to ensure best price has been slow. We noted little evidence of negotiations with consultants and very limited use of in-house cost estimates. We also found indications that the evaluation and use of consultant overhead rates, though better, could be further improved.

Processes to Ensure Best Price Limited

We found the department lacked the necessary processes to ensure the negotiation of best price.

Identifying and evaluating consultant overhead and direct labor rates for reasonableness, preparing in-house cost estimates, capturing significant costs associated with contracting, and using the evaluative and cost information in negotiations, are all important processes for ensuring best price.

We found the department did have a process for evaluating consultant overhead rates; however, the process was understaffed. Department staff also indicated the work performed in this area was primarily self-directed.

Further, during our audit, staff responsible for evaluating consultant overhead rates went from two to one. After we completed our fieldwork, this last individual was assigned other duties, leaving no one available to review overhead rates. In contrast, local Federal Highway Administration officials told us Washington State's Department of Transportation had six staff dedicated to this function.

The department also did not have processes in place to analyze the reasonableness of consultant direct labor rates, or to ensure in-house cost estimates were prepared for comparison to contractor proposals.

Further, the department's information gathering and reporting system did not align with its increased use of outsourcing. Specifically, the system does not capture all significant costs associated with contracting that could be used to evaluate contractor proposals and to strengthen contract negotiations.

Follow-up Finds Slow Implementation of Negotiation and Evaluation Process Improvements

The department's implementation of contract negotiation and evaluation process improvements has been slow. Although department management demonstrated an awareness of needed improvements and developed procedures for process improvements, actual implementation of the procedures has been limited.

We reviewed contract files for four Agreements to Agree and seven work order contracts, and found little evidence that negotiations with the consultants occurred. In some cases, we did find evidence to suggest a negotiation may have occurred, but the underlying documentation to

support a negotiation was not available.

Further, department staff told us contract files were not periodically reviewed to assess the completeness and accuracy of the contract negotiation process.

We were also told one contract administrator was preparing in-house cost estimates using the department's historical data. However, the contract administrator told us that he had prepared only two cost estimates for individual work order contracts as of October 2005.

We did find improvements in the evaluation of consultant overhead rates. The number of staff dedicated to this task increased from zero to three. However, the "best practices" we identified, and comments from department staff, suggest this function may still not have the resources needed to adequately perform this task. Additionally, department staff explained the department does not have a process in place to ensure consistent and current consultant overhead rates are maintained for department-wide use.

Other Matters

State Needs to Maintain Adequate Engineering Expertise

The Federal Highway Administration recommends state transportation departments maintain competencies in engineering. These competencies ensure transportation departments have the in-house expertise needed to monitor consultants and make informed decisions regarding the quality and price of consultant services.

Experienced department engineers are actively recruited by private sector design engineering firms. We found the department

was losing experienced staff to these firms and noted a number of instances in which former department engineers are now working for consultants.

For instance, five out of seven bridge unit managers left the department to work for consultants between September 2003 and January 2004. Also, four of the original 12 contract administrators for the work order contracts in our cost comparisons left the department to work for consultants. Department officials expressed concern and awareness of the potential consequences of lost expertise.

Department managers stated that they intend to respond to the loss of engineering expertise with salary increases, a new engineering classification system, improved career paths, and by re-starting the department's Graduate Engineering Program.

Recommendations

We recommend the department implement the necessary processes to ensure negotiation of best price, including the following:

- Review the local market conditions for direct labor rates and incorporate this information into contract negotiations;
- Utilize either current overhead rate audits performed according to Federal guidelines and accepted by the department, or overhead rates evaluated by the department and negotiated with the consultant;
- Centrally compile, regularly update, and make available consultant overhead rates to all internal users;
- Designate sufficient staff to review and analyze consultant direct labor and overhead rates;
- Designate sufficient staff to prepare in-house cost estimates,

using historical cost information;

- Compare in-house cost estimates to consultant proposals for each project. Consider in-house contract negotiation, preparation, and monitoring costs when evaluating comparisons. Use this information in contract negotiations;
- Modify information gathering and reporting systems to capture cost information in categories necessary for the negotiation of best price;
- Ensure all contract files have a complete record of negotiations, including initial negotiation positions, discussions with consultants, and final negotiation results; and
- Periodically sample and review contract files to assess the completeness and correctness of the negotiation process.

Agency's Response:

The department agrees with the audit recommendations. The department's response to the recommendations begins on page 8.

Objectives, Scope and Methodology

The objective of our audit was to determine if the Oregon Department of Transportation's methods of obtaining design engineering services for projects results in the lowest possible cost to the state.

To carry out this objective, we conducted interviews with, and received cost data from, department staff including: contract administrators, the cost allocation unit, the Procurement Office, Financial Services, and the Office of Project Delivery. We met with members of the Federal Highway Administration, and with representatives of design

engineering firms. We surveyed 16 states, including Oregon, regarding their use of consultants. We reviewed five Agreement to Agree contract files, and their associated work order contracts, for four different consultants. We researched pertinent federal and state laws, state administrative rules, and departmental policies and procedures.

We noted the department has two options for obtaining design engineering services, either to use in-house engineering resources, or to use private sector design engineering firms. Our analysis of engineering costs entailed a comparison of these two service provision options.

We selected a sample of 12 from a total of approximately 400 design projects produced by consultants from July of 2000 through June of 2003.

We selected the projects we reviewed at random, although certain considerations did apply. For instance, we chose projects within the technical capabilities of both the department and consultants using similar staffing. We also wanted projects performed by a variety of contractors, and we wanted to include several types of projects in our review, such as geohydro, environmental, roadway, and bridge projects.

We calculated consultants' costs for these projects by using invoices they submitted to the department. Using the consultants' breakdowns of staff hours, staff positions, and reimbursable expenses, we calculated an estimated cost to provide the service in-house.

In general, we used the full cost of services in our cost comparisons. For example, we identified costs such as contract monitoring and captured them as part of our testing process.

However, we did not have the information available, or did not

have a suitable methodology, for including all potential cost factors in our comparisons. For instance, we did not have a suitable methodology for capturing the contracting costs borne by the department in creating and negotiating each individual contract. We also did not have the information available to capture costs incurred by consultants for variances in their workload levels. Further, we did not have the information to factor in business taxes, paid by consultants, that could potentially offset the cost of outsourcing design engineering projects. We also were not able to evaluate innovative and other qualitative differences, if any, between contractor and department work.

For several sampled projects, our comparisons did not include all work performed, since some of it was performed outside our audit period. Because we did not base any assumptions or conclusions on total project cost, this factor was not considered relevant to our results.

We determined that the information systems used to capture and report labor hours, calculate labor rates, and determine contractor payments, were of sufficient reliability for our audit. We were not able to determine the reliability of the department's overhead cost allocation system as a whole. We were able to reconcile to a 5 percent difference the total expenses allocated by the cost allocation system and the total expenses included in the department's accounting information system. However, given the complexities of testing the overhead cost classifications of individual expense items, we determined it would not have been cost beneficial for us to perform this work.

We conducted our initial fieldwork from June 2003 to July

2004. We shared our findings and recommendations with department officials in June and September of 2004.

We performed additional fieldwork in September and October of 2005 to assess the department's progress toward addressing issues we identified in our audit. This fieldwork involved interviews with department staff and additional contract file review.

We conducted our audit in accordance with generally accepted government auditing standards.

Agency's Response

Status of actions already taken that address Secretary of State Audit entitled *Department of Transportation: Engineering Services Cost Analysis*

Recommendation: Review the local market conditions for direct labor rates and incorporate this information into contract negotiations.

Response: Implemented. The department has worked with Oregon Bridge Delivery Partners (Bridge Partners) to negotiate salary ranges by categories, salary caps, and cost of living increases. In addition, the department has implemented guidelines for justifying increases in direct labor rates based on the Portland-Salem Consumer Price Index and maintains records of recent contract wage history. As part of pre-award review, the department's Audit Services compares key labor rates to 2005 Zweig White Financial Performance Survey. All of this information is available for use by department staff in negotiating direct labor rates.

Recommendation: Utilize either current overhead rate audits performed according to Federal guidelines and accepted by the department, or overhead rates evaluated by the department and negotiated with the consultant.

Response: Implemented. Department practices have been and continue to be consistent with this recommendation for the OTIA III State Bridge Delivery Program. The department has continually required audits to be conducted in accordance with the cost principles contained in the Federal Acquisition Regulations. The department performs and accepts cognizant audits in accordance with Federal Regulations. Additionally, a pre-award audit for the Agreement to Agree (ATA) with the Bridge Partners was conducted and a negotiated rate was applied to the Bridge Partners' joint venture firms.

The department also implemented a billing rate policy in April 2004 for the Bridge Partners' ATA, which required audited overhead rates from consultants and capped unaudited rates at 150%, as applied to direct labor.

Audit Services performs overhead rate audits in accordance with Federal guidelines and Government Auditing Standards. The department's audit work was recently peer reviewed by the American Association of State Highway and Transportation Officials and found to be in full compliance with these standards. The peer review team looked specifically at the changes made during 2005 and were very complimentary of the improvements, particularly the development of new audit procedures in a relatively short period of time. To provide information for contract negotiations, Audit Services prepares a report recommending an appropriate overhead rate in compliance with Federal guidelines and sends it to the contract officer. In some instances, a full audit may not be necessary, in which case Audit Services might perform a high-level review of potential contractors to provide additional information to contracting officers. Increasingly, the department is challenging overhead rates that do not appear to be fair and reasonable.

Recommendation: Centrally compile, regularly update, and make available consultant overhead rates to all internal users.

Response: In progress. The department maintains a list of overhead rates being used in contract negotiations for the OTIA III program and collects similar data on some personal services consultant contracts. This information is referenced when evaluating and negotiating costs on new contracts. Department units are working with Audit Services to compile direct labor and overhead data on all personal services consultant contracts and to make this data available during cost analysis and negotiations. The initial focus will be placed on architectural and engineering contracts.

Recommendation: Designate sufficient staff to review and analyze consultant direct labor and overhead rates.

Response: Implemented. This recommendation is currently included in the Bridge Partners' Program Procedures Manual and is required by the Bridge Partners' ATA contract and provisions required in subcontracts. In addition, the department has made improvements to procurement and audit staffing that will provide more assurance that consultant direct labor and overhead rates are fair and reasonable.

To better support procurement activity at the Region level, the department has moved eight contract officers to Region offices to boost negotiating expertise and support the entire spectrum of procurement activity. The department has also established five teams of contract officers, each with a focus on a specific area of procurement. These teams will strengthen customer support, facilitate communication, promote shared learning, and improve consistency in procurement practices.

Audit Services is now fully staffed with three full-time professional auditors to conduct overhead audits. A new department overhead policy, currently in draft form, recommends that firms having a great deal of work with the department obtain independent overhead audits. Audit Services will be reviewing the work papers and issuing a letter of concurrence (or disagreement) with the independent audit conclusions rather than conducting the fieldwork. This policy shifts a large portion of the audit resource requirements to the consulting firms and is expected to reduce the burden on our current available resources. The department will re-evaluate the adequacy of audit resources after reviewing the effects of this new requirement in the overhead policy.

Adopting the recommended overhead policy will help the department accomplish the goal of conducting audits based on risk. Audit Services reserves the right to audit any consultant, regardless of the amount of work they perform for the department.

Recommendation: Designate sufficient staff to prepare in-house cost estimates, using historical cost information.

Response: In progress. The department and the Bridge Partners have developed a detailed contracting process for the state bridge delivery program of OTIA III. Section 16.5 of the Bridge Partners' Program Procedures Manual, approved by the Department of Justice, describes this process, which requires the maintenance of records of negotiations to clearly identify cost efficiencies gained through the negotiation process. Additionally, the department develops independent cost estimates and approves the scope and fee estimates negotiated by the Bridge Partners. The department is creating a historical record of design fees for the OTIA III program that will be available for agency use in comparing independent cost estimates.

The department will soon begin developing standard process and format for internal cost estimates for design engineering services. Steps included in this process are comparing in-house cost estimates to consultant proposals for each project and using this information in contract negotiation, preparation, and monitoring.

Recommendation: Compare in-house cost estimates to consultant proposals for each project. Consider in-house contract negotiation, preparation, and monitoring costs when evaluating comparisons. Use this information in contract negotiations.

Response: Implemented. The department has implemented this recommendation for services obtained in support of the OTIA III program through the Alternative Delivery Unit and is beginning to apply it to other procurement contracts within the agency. For example, this recommendation will be implemented for work negotiated under a soon-to-be-signed full-service design engineering contract for local agencies. Also, see above response to recommendation to "designate sufficient staff to prepare in-house cost estimates, using historical cost information."

Recommendation: Modify information gathering and reporting systems to capture cost information in categories necessary for the negotiation of best price.

Response: In progress. See response above to recommendation to "centrally compile, regularly update, and make available consultant overhead rates to all internal users."

Recommendation: Ensure all contract files have a complete record of negotiations, including initial negotiation positions, discussions with consultants, and final negotiation results.

Response: Implemented. This recommendation is included in the Bridge Partners' Program Procedures Manual, Section 16.5. The department has records of all negotiations with the Bridge Partners for bridge delivery program management services.

The department has developed a "Record of Negotiations" standard form and associated guidelines. This worksheet provides documentation of negotiation activity and is being implemented in current consultant negotiations. For example, it will be used for each ATA of the full-service design engineering contract for local governments.

OAR 731-146-0030(3)(d) Permanent Files took effect on March 1,2005. This rule requires the record of negotiation be a part of the permanent procurement file. It applies to all procurements entered into on or after March 1, 2005.

Recommendation: Periodically sample and review contract files to assess the completeness and correctness of the negotiation process.

Response: In progress. The department has developed an audit plan for the OTIA III program that includes outsourced services and a full-time quality assurance staff member. The department has recently hired a Procurement Programs Manager who will oversee the program structure of the procurement function. This recommendation will be implemented as staffing is added in various areas of expertise. Program areas to be staffed in the near future include a Contracts Compliance Officer, Risk/Legal Analyst, Oregon Procurement Information Network Coordinator, and Contracts Trainer.



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The courtesies and cooperation extended by the officials and staff of the Oregon Department of Transportation were commendable and much appreciated.

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