
Secretary of State

State of Oregon

OREGON DEPARTMENT OF TRANSPORTATION

Highway Construction



Audits Division

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Auditing for a Better Oregon

Senator Gene Timms and
Representative Jim Welsh, Co-Chairs
Legislative Audit Committee

Dear Committee Members:

At the September 1997 and November 1997 meetings of the Legislative Audit Committee, the Oregon Audits Division presented the results of its audit survey at the Oregon Department of Transportation (ODOT). The survey summarized the views and concerns of ODOT stakeholders and identified potential audit issues. Based on input from committee members, the Audits Division began work on five of the proposed projects.

This report, one of the five projects, provides information regarding the construction phase of the highway construction process. Overall, we found that ODOT complies with key requirements in awarding and managing construction contracts. The report reviews ODOT's success in controlling construction costs overruns, and provides recommendations for improving the development and management of contracts.

We received the full cooperation of ODOT management and staff. Their assistance was crucial to our completing this report.

OREGON AUDITS DIVISION

John N. Lattimer
Director

Fieldwork Completion Date:
May 28, 1998

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SUMMARY

PURPOSE

At the September 1997 and November 1997 meetings of the Legislative Audit Committee, the Oregon Audits Division presented the results of its audit survey at the Oregon Department of Transportation (ODOT). The survey summarized the views and concerns of ODOT stakeholders and identified potential audit issues. Based on input from committee members the Audits Division began work on five of the proposed projects. This report, one of the five projects, is a review of ODOT's highway construction contract award and management processes.

BACKGROUND

ODOT's highway construction, which consists of a wide variety of projects including pavement resurfacings, bridge repairs, road widenings and realignments, and building new interchanges and overpasses, is accomplished through contracting. Contracts are awarded to the lowest responsible bidder as required by Oregon law. ODOT budgeted \$887 million for highway construction for the 1995-97 biennium. \$579 million of this amount was for payments to contractors. ODOT awarded 295 contracts for \$544 million during the biennium.

There were 236 highway construction projects completed during the 1995-97 biennium. The total contract award was \$354 million and the total final amount paid to the contractors was \$378 million.

RESULTS IN BRIEF

- We found that all highway construction contracts let during the 1995-97 biennium were subject to competitive bidding and that the number of bidders, on average, was similar for projects of all sizes. A review of the projects completed during the 1995-97 biennium showed that the contract award, as a percentage of the ODOT estimate, declined as the number of bidders increased.
- Our analyses of costs for the contracts completed during the 1995-97 biennium showed that the average final amount paid to contractors in excess of the bid amount was 6.62 percent, which compared favorably with the reported results of some other states. We also found that final payments in excess of contract award amounts, on average, were higher for

ODOT's Region 1 (Portland headquarters) than other ODOT regions and were also higher for large projects.

- In our review of contract time we found that specified completion dates are only a general guideline. Over half of the projects were completed later than the initial specified completion date. Completion dates are frequently amended and charges to contractors for failure to meet those dates are relatively small.
- We reviewed the projects for the four ODOT project managers with the highest average excess payments and found that the elevated averages were the result of circumstances outside the project managers' control.
- We reviewed 20 completed contracts in detail and found that 47 percent of the contract cost increases could be attributed to design errors and omissions, contract specification problems, estimation errors, and extra work not originally identified in the design phase.

RECOMMENDATIONS

In our recommendations to the Oregon Department of Transportation (ODOT), we recommended that ODOT continue to require the use of project development teams and emphasize the importance of avoiding cost increases that do not add value to a project. In addition, we recommended that ODOT begin recording the causes of contract cost increases using distinct categories. This information should then be evaluated and communicated to the appropriate staff in order to better control future contract cost increases. Furthermore, we recommended that ODOT consider contractors' past performance when awarding highway construction contracts. ODOT should also consider using the prequalification process to establish contractors' capacity limits for performing highway construction.

AGENCY RESPONSE

In its response, which is included in this report, the Oregon Department of Transportation generally concurred with our recommendations.

INTRODUCTION

BACKGROUND

The Oregon Department of Transportation (ODOT) was established in 1969 under the provisions of Oregon Revised Statute (ORS) 184.615 with the transfer of duties, functions, and powers of the State Highway Department and other transportation related agencies. The department was reorganized in 1973 and 1993 by legislative action. Oversight responsibility is vested in a five-member Transportation Commission appointed by the Governor. The Commission, subject to approval by the Oregon Senate, appoints ODOT's director.

The department's mission is to develop and maintain an integrated, balanced, statewide transportation system that moves people, goods and services safely and efficiently throughout the state. The state highway system totals about 8,177 miles. During the 1995-97 biennium, the department employed approximately 4,400 people and had an operating budget of \$1.55 billion. The amount budgeted for highway construction for the biennium was \$887 million. \$579 million of this amount was for payments to contractors.

Highway construction includes a wide variety of projects such as: pavement resurfacings, bridge repairs, road widenings and realignments, and new interchanges and overpasses. The most costly projects are known as modernization projects; these add capacity to the highway system either by building new facilities, adding lanes, or adding and widening exits. Pavement preservation projects are major road resurfacing projects. Both types of projects are contracted.

ODOT awarded 295 contracts for highway construction projects from July 1, 1995, through June 30, 1997. The total award amount was \$544,451,263. During the same period, 236 highway construction projects were completed. The total contract award was \$354,462,600 and the total final amount paid to the contractors was \$377,942,638 for these projects. The 236 projects had been awarded to 83 primary contractors. Approximately

80 percent of the total contract amount went to 21 of the contractors.

CONTRACT AWARD PROCESS

ODOT uses a two-step process, as required by state law, to award highway construction contracts. The first step is prequalification of bidders. Only prequalified bidders may be awarded a contract. To prequalify, an applicant completes a standard questionnaire reporting information on the firm's financial position, equipment inventory and condition, key employees, references for past projects, and the intended bonding company. ODOT staff review the applications for completeness. They do not investigate the applicant's past performance or capabilities. ODOT relies on a contractor's ability to obtain a performance bond as evidence that the contractor meets ODOT's requirements. Some projects which are highly technical in nature require a special prequalification.

The second step is the award of the contract. ODOT provides prospective bidders with plans and specifications for the individual projects. ODOT engineers estimate the cost of a project based on a detailed analysis of site conditions, specified materials and processes, and other factors. This estimate is not shown to the public before bidding; it is used by ODOT to assess the reasonableness of the bids received. Bidders are responsible for examining the site and bidding documents to gain an understanding of the conditions to be encountered in performing the work and all requirements of the contract. Contractors submit their bids for a project to ODOT and the contract is awarded to the lowest responsible bidder as required by Oregon law. ODOT may elect to rebid the project if all of the contractor bids are higher than the project estimate prepared by ODOT. Concurrence from the Federal Highway Administration is required prior to awarding the contract for certain federal-aid projects. The successful bidder must provide a performance bond in the amount of the contract prior to ODOT's execution of the contract.

A Notice to Proceed is issued by ODOT within five calendar days after the contract is executed, otherwise the

contractor may apply for an adjustment of the allowed contract time.

CONSTRUCTION MANAGEMENT

The contractor is expected to complete the construction work according to the plans, specifications, and terms of the contract. The contractor and the ODOT project manager assigned to the project are expected to maintain regular communication to ensure consistent interpretation of contract requirements. Change orders are used when adjustments to the specified work are required. Change orders may be needed for adjusting material specifications and quantities, correcting design errors or omissions, performing extra work, providing more time for the contractor to complete the project, and other reasons. Change orders may increase, decrease, or have no effect on the total amount paid to a contractor.

Contracts specify how much time the contractor has to complete the work, and require the contractor to pay liquidated damages to the state when the contract work is not completed on time. The allowable time can be extended by ODOT when delays occur that are not the contractor's fault or when extra work is ordered.

The project manager and staff monitor the contract work with on-site inspections and tests to ensure that the materials used and work performed conform to contract requirements. Throughout the construction period, samples of materials, such as pavement mixtures, are also sent to the ODOT Materials Testing Laboratory in Salem for additional testing.

The contractor is paid monthly based on the value of work accomplished. When the contractor has completed the construction work, ODOT conducts a final inspection. When the work is found to be complete and satisfactory, and the contractor has cleaned up the site, the project is considered complete. ODOT then prepares a final estimate of the quantities of the various contract items of work actually performed. The estimate and the terms of the contract and all supplemental agreements are used to determine the total amount earned by the contractor. A

final payment is made to the contractor in the amount of the total amount earned less the sum of the previous payments made to the contractor.

SCOPE AND METHODOLOGY

The objective of our audit was to review the effectiveness of ODOT's cost and time controls during the construction phase of highway construction projects. We had the following specific objectives:

- Identify opportunities to improve the cost and time-effectiveness of the department's management of highway construction projects.
- Determine compliance with key laws, regulations, and ODOT policies and procedures pertinent to our overall audit objective.

To accomplish our audit objectives, we reviewed applicable federal and state laws, regulations, policies and procedures. We also interviewed ODOT personnel. In addition, we conducted a survey of the ODOT project managers.

We obtained and read reports of similar audits from other states, the United States General Accounting Office, and ODOT's Audit and Review Services Section.

We analyzed bid and contract cost and time information for the 236 projects completed during the period July 1, 1995, through June 30, 1997, using information from ODOT's Contract Payment System (CPS) and TRNS*PORT system. Using this analysis, we selected 20 projects for a detailed review of the project files. Most of the 20 projects selected were projects that had significant cost or time overruns, and/or a large number of change orders.

We also analyzed bid information for the 295 projects that had contracts awarded from July 1, 1995, through June 30, 1997, using information maintained by ODOT.

We conducted this audit in accordance with generally accepted government auditing standards. We limited our review to those areas specified in this section of the report.

AUDIT RESULTS

CONTRACTS ARE COMPETITIVELY AWARDED

For highway construction work, Oregon Revised Statute (ORS) 279.029 requires competitive bidding and contract award to the lowest bidder. Our analysis of the 295 contracts awarded by ODOT during the period July 1, 1995 through June 30, 1997 indicates that all were subject to competitive bidding and that the number of bidders was similar for projects of all sizes.

Table 1
Average Number of Bidders
Contracts Awarded 7/1/95 – 6/30/97

Project Size	Number of Projects	Average Contract Award	Average Number of Bidders
Less than \$500,000	112	\$251,617	3.91
\$500,000 to \$1 million	73	\$638,258	4.12
\$1 million to \$5 million	84	\$2,167,028	4.26
Above \$5 million	26	\$11,063,346	4.85

We also analyzed the 236 projects completed from July 1, 1995 through June 30, 1997 to determine if differences between the contract award amount and the estimate prepared by ODOT were associated with the number of bidding contractors. Table 2 shows that the award, as a percentage of the ODOT estimate, declined as the number of bidders increased. Larger contracts were associated with more bidders and bids significantly below ODOT estimates.

Table 2
 Number of Bidders and Differences
 Between Estimated and Awarded Contract Amounts
 Projects Completed 7/1/95 – 6/30/97

Number of Bidders	Number of Contracts	Average Contract Award	Average Award Under ODOT Estimate
1	8	\$ 560,794	- 0.2%
2	26	\$1,013,313	- 16.2%
3	43	\$ 604,392	- 15.4%
4	52	\$1,439,951	- 20.4%
5	40	\$1,347,046	- 21.9%
More than 5	67	\$2,520,627	- 25.9%
Overall	236	\$1,501,960	- 22.5%

ANALYSIS OF LOW BIDDING

It was alleged that some contractors intentionally submit very low bids with the intention of obtaining the work and using change orders to earn a normal profit on a project. We looked for indications that this practice had occurred and resulted in excessive project costs or unusual budget overruns. For all 236 projects completed from July 1, 1995 through June 30, 1997, the average difference between the lowest bid and the average bid was 9.8 percent. To evaluate projects with very low bids, we reviewed the 62 projects that had a low bid that was 15 percent or more below the average bid amount. Of the 62 projects, there were only two (3 percent) in which the final amount paid to the contractor exceeded the average bid amount. For all 236 projects, there were 49 (21 percent) where the final amount paid exceeded the average bid amount. This evidence indicates that very low bids were not associated with excessive project costs.

In another test, we compared the final amounts paid to contractors to the contract award amount. As is shown in Table 3, the average excess for the 62 projects (5.55 percent) was lower than the 6.62 percent average for all 236 projects. This evidence indicates that very low bids were not associated with higher than average final payments in excess of contract award amounts.

Table 3
 Construction Contract Comparison:
 Bids 15% or More Below Average Bid
 Projects Completed 7/1/95 – 6/30/97

	Low Bid of 15% or More Below Average Bid	All Projects
Number of Projects	62	236
Average Bid	\$1,024,422	\$1,665,218
Average Low Bid	\$816,959	\$1,501,960
Average Final Payment	\$862,295	\$1,601,452
Average Final Payment Over Low Bid	5.55%	6.62%

**OVERALL CONTRACT
 COST ANALYSIS**

Our report compares construction contract awards to the final amounts paid to contractors. ODOT uses a different performance measure. ODOT compares the total cost of a project to the amount authorized. Construction authorization equals the contract award amount, plus a contingency margin equal to four and one-half percent of the contract award amount, plus an authorized amount for construction engineering costs. Most projects also have authorized amounts for anticipated items; work items that may be performed but are not bid items included in the awarded contract. The winning bidder often performs anticipated item work and thus receives payments in excess of the contract award but within the authorized construction amount.

The average final payment to contractors in excess of the contract award for all 236 projects was 6.62 percent. This compares favorably with the average of 10 percent for highway construction projects completed for the state of Washington, as determined in a recent performance audit of that state's Department of Transportation (DOT). That report gives averages for some other states: 8.8 percent for Minnesota; 9 percent for Florida; and 7 percent for Wisconsin. A performance audit of the Arizona DOT shows an average there of 6.3 percent.

Cost analysis by ODOT region showed that the average contract excess was highest for Region 1, which consists primarily of the Portland metropolitan area. This result can be attributed to more complex projects, traffic impacts, right-of-way issues, and other factors associated with working in urban areas. Table 4 shows these results.

Table 4
Construction Contract Cost Comparison by Region
Projects Completed 7/1/95 – 6/30/97

Region Headquarters	ODOT Region	Number of Projects	Average Contract Award	Average Contract Cost Excess
Portland	1	62	\$1,373,112	10.08%
Salem	2	50	\$1,418,875	4.21%
Roseburg	3	43	\$1,731,681	6.08%
Bend	4	34	\$1,871,201	5.69%
La Grande	5	47	\$1,283,037	6.23%
Overall		236	\$1,501,960	6.62%

We also performed an analysis of project cost by project size. We found that the larger projects, on average, had larger contract excesses. This may be due to the greater complexity, with more construction uncertainty, of the larger projects. Table 5 shows these results.

Table 5
Construction Contract Cost Comparison by Project Size
Projects Completed 7/1/95 – 6/30/97

Project Size	Number of Projects	Average Contract Award	Average Contract Cost Excess	Range
Over \$10 million	8	\$10,735,597	10.69%	0.50 to 22.93%
\$5 to \$10 million	16	\$6,055,744	9.15%	– 6.06 to 47.79%
\$1 to \$5 million	65	\$1,815,144	4.43%	– 14.59 to 59.81%
Less than \$1 million	147	\$365,317	0.37%	– 57.14 to 63.73%
Overall	236	\$1,501,960	6.62%	– 57.14 to 63.73%

**CONTRACT TIME
COMPLETION ANALYSIS**

Each contract has a specified completion date. This date is contained in the initial solicitation of bids. It may, however, be amended at various points during the lifetime of the project. For instance, if ODOT makes changes to plan specifications prior to bid opening, opening may be delayed, which may result in extending the specified completion date. More often, on-site conditions during construction will delay the project. These could involve an expanded scope of work, site conditions which were unanticipated, or unseasonable weather. ODOT will amend the specified completion date for cause. Contracts contain a clause allowing the state to charge liquidated damages for each day past the specified completion date. These charges are not intended as a penalty but, rather, are intended to reimburse ODOT for its additional costs.

Our analysis indicated that 55 percent of the 236 projects completed during the 1995-97 biennium were completed past the original specified completion date. Table 6 supports the premise that the larger complex projects are more prone to time delays than the smaller projects. The average days beyond the original specified completion date increase steadily as project size increases. Of the 20 projects analyzed in depth, we noted that liquidated damages were assessed on six projects (30 percent) for completion after the amended completion date. We noted that ODOT reversed these charges for two of the projects. Liquidated damages collected totaled \$17,450 for the 20 projects.

Table 6
 Completion Time by Project Size
 Projects Completed 7/1/95 – 6/30/97

Total Project Costs	Number of Contracts	Contracts Completed On or Before Initial Specified Date	Contracts Completed Past Initial Specified Date	Extremes of Range		Average Days Late Excluding Extremes
				Days Early	Days Late	
Over \$10 million	8	1	7	0	306	130
\$5 to \$10 million	16	5	11	188	787	127
\$1 to \$5 million	65	24	41	134	434	61
Less than \$1 million	147	76	71	149	532	22
Overall	236	106	130	188	787	42

PROJECT MANAGEMENT

We analyzed the 236 completed projects to determine whether construction cost results were associated with individual ODOT project managers. We restricted our analysis to the 10 project managers who were responsible for at least 10 projects.

For the 10 project managers, we found that the average contract cost excess ranged from one percent to 18 percent. Four project managers had the highest cost averages: 18, 15 and 10 (two project managers) percent. These four project managers were responsible for a total of 52 completed projects, and our review of costs showed that 25 of the 52 contracts (48 percent) were completed at or below the contract award (bid) amount. In addition, our review showed that the cost excess from a single large project accounted for most of the total excess for each of the four project managers. These cost excesses resulted primarily from:

- Incomplete ODOT plans and specifications. Examples include missing project plan details, and underestimated quantities of embankment materials.
- Unforeseen site conditions. In one case a bridge required redesign because a Native American burial site was discovered when work for the bridge footing was begun.

- Scope increases that were initiated by ODOT. Examples include the addition of a storm sewer system, and the addition of site provisions for a future intersection.
- Unanticipated mudslides and rockfalls.

The increased costs were the result of overruns in a single large project, and were the result of circumstances outside of the control of the project managers.

DETAILED REVIEW OF SELECTED PROJECTS

In addition to the analyses above, we judgmentally selected for detailed review 20 projects from the 236 projects completed from July 1, 1995, through June 30, 1997. To identify potential areas for improvement, we intentionally selected projects with significant contract cost excesses or time overruns, and/or a large number of change orders. The results of our review follow.

CHANGE ORDERS WERE PROPERLY AUTHORIZED

We reviewed all 663 change orders that were approved for the 20 projects. All had evidence that they were allowable and were reviewed and authorized in accordance with ODOT's policies and procedures.

PERFORMANCE BONDS WERE OBTAINED

We determined that performance bonds were purchased by contractors as required (in the amount of the contract and prior to ODOT giving the contractor a Notice to Proceed) for all 20 projects.

**PROJECT DESIGN PROBLEMS
CAN CAUSE SIGNIFICANT
CONTRACT COST INCREASES**

Our review of the change orders for the 20 projects revealed that a significant portion of contract cost increases could be traced to the design phase. A project's design phase involves preparing comprehensive design and construction documents suitable for competitive bidding. This phase includes a wide variety of activities, such as material analysis, roadway design, environmental permitting, traffic analysis, and developing contract plans and specifications. We determined that at least \$6,851,319 (47 percent) of the \$14,704,784 in total contract cost increases for the 20 projects we reviewed were judged to be the result of design errors and omissions, contract specification problems, estimation errors, and extra work not originally identified in the design phase.

A recent performance audit of the Arizona Department of Transportation reported that 65 percent of the contract cost increases there were related to the design phase. That report also noted that, according to construction industry representatives, 70 to 75 percent of the problems encountered during construction are generated in the design phase. According to ODOT managers, the engineer must weigh the additional cost to create more precise plans against the potential benefit of fewer contract changes.

**BETTER INTERNAL
COMMUNICATION CAN LIMIT
COST INCREASES**

Some of the contract cost increases were the result of conditions and events that were not foreseeable. For example, mudslides, rockfalls, and unusually wet or cold weather increased the cost of some projects. Other cost increases were the result of an increase in the scope of a project (for example, the addition of an exit to a highway) that increases the utility of a project. Avoiding costs that are foreseeable and do not add utility to a project provide an opportunity for savings. We noted some apparent instances of these opportunities while reviewing the 20 projects. One example was the unintentional siting of a temporary materials stockpile on a reportedly well-known Native American encampment site considered to be archeologically significant.

Change orders resulting from this oversight increased project costs by more than \$1 million. Another example was constructing sidewalks that were not in compliance with the Americans with Disabilities Act (ADA) even though construction began about one-and-one-half years after the Act was signed into law. The reconstruction cost was approximately \$200,000 to comply with ADA standards.

Better communications between ODOT organizational units might have helped avoid some of the contract cost increases. To address this problem, ODOT formally implemented project development teams in 1996. Team members follow a project from the design phase through the construction phase. The composition of these teams vary depending on the size and complexity of the project. With the goal of improving communication, a team may include members from other state agencies, local governments, utilities, and other stakeholders groups in addition to ODOT employees.

Audit Recommendation

We recommend that ODOT continue to require the use of project development teams and emphasize the importance of avoiding costs that do not add value to a project.

EVALUATION OF PROJECT COST INCREASES CAN HELP CONTROL FUTURE COST INCREASES

ODOT should systematically evaluate the causes for highway construction cost increases and use that information to determine cost-saving measures for future projects. In order to efficiently evaluate cost increases, the department needs to record and classify cost increase information, by cause, in the Contract Payment System (CPS). However, while performing the audit, it came to our attention that ODOT does not perform this review. The CPS includes a change order description field but the field is not used consistently. A more organized approach, whereby employees use the CPS to classify contract amendments and change orders according to cause, could provide information for avoiding repeat errors.

Audit Recommendation

We recommend that ODOT begin recording the causes of contract cost increases using distinct categories. This information should then be evaluated and communicated to the appropriate staff in order to better control future contract cost increases.

**PREQUALIFICATION
PROCESS CAN BE
IMPROVED**

ORS 279.037 provides for the disqualification of a bidder when the bidder does not have sufficient financial ability, equipment, or key personnel available to perform the contract, or has repeatedly breached contractual obligations to public and private contracting agencies. ODOT reviews a contractor's prequalification application but does not perform separate inquiries to verify the accuracy of the information in the application, nor does it consider past performance of a contractor in awarding highway construction contracts. ODOT's practice assumes that a contractor's ability to obtain a performance bond sufficiently demonstrates ability to meet ODOT's requirements. Only in the case of repeated contract breaches would a contractor be disqualified from bidding. The manager of the Construction Contracts Unit could recall only one contractor being suspended from bidding as a result of disqualification.

Awarding contracts to the lowest bidder without considering past performance may result in repeat hiring of under-performing contractors. Several of the ODOT construction project managers responding to our survey indicated that they had experience with at least one poorly performing contractor.

At the request of a Representative of the Oregon House of Representatives, ODOT reviewed 10 other states' procedures for contractor prequalification. A report titled "Review of Measures Used by Other States to Determine Eligibility for Construction Prequalification" was prepared by ODOT in December 1997. All 10 states surveyed actively evaluate prequalification applications. Past performance experience with a contractor is considered by seven of the 10 states. Eight of the 10 states determine a contractor's capacity by

setting a limit on total contract amount that a contractor is allowed to work on.

Audit Recommendation

We recommend that ODOT consider contractors' past performance when awarding highway construction contracts. ODOT should also consider using the prequalification process to establish contractors' capacity limits for performing highway construction.

REPORT DISTRIBUTION

This report is a public record and is intended for the information of the governor of the state of Oregon, the Legislative Assembly, the Oregon Department of Transportation, and all other interested parties.

COMMENDATION

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

AUDIT TEAM

Jim Pitts, Audit Administrator
Gary Fredricks, CPA
Chuck Hibner, CPA
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AGENCY'S RESPONSE TO THE AUDIT REPORT



Oregon

John A. Kitzhaber, M.D., Governor

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June 26, 1998

File Code:

Mr. John Lattimer
State Auditor
Secretary of State Audits Division
255 Capitol Street NE, Suite 500
Salem, Oregon 97310

Dear Mr. Lattimer:

I'm pleased with the Audits Division review of ODOT's highway construction contract award and management processes. Your findings indicate that ODOT has performed well in the highway construction contract process, yet you identify some areas for improvement. While we believe that the review is well written and fair in its assessment of construction activities, I'm offering supplementary information on the major findings. I believe this will provide reviewers with additional perspective helpful in understanding the issues. We do generally concur with the recommendations for improvement offered in the review.

Recommendation #1

"We recommend that ODOT continue to require the use of project development teams and emphasize the importance of avoiding costs that do not add value to a project."

Response to Recommendation #1

We are concerned when construction cost overruns do occur and agree that continued use of project teams will help keep costs in check.

Recommendation #2

"We recommend that ODOT begin recording the causes of contract cost increases using distinct categories. This information should then be evaluated and communicated to the appropriate staff in order to better control future contract cost increases."

Response to Recommendation #2

ODOT currently has a process in place to document lessons learned from any project problems, including design, and pass them on to designers and other key personnel. At the completion of all construction projects, the Project Manager writes and distributes a narrative report of project issues – things that worked well and things that need improvement. However, we will look into tracking and analyzing for comparison the specific causes of cost increases.

Form 751-001

June 26, 1998
Mr. John Lattimer

Recommendation #3

“We recommend that ODOT consider contractors’ past performance when awarding highway construction contracts. ODOT should also consider using the prequalification process to establish contractors’ capacity limits for performing highway construction.”

Response to Recommendation #3

While many states set some limits on contractors’ ability to bid jobs, our research shows that these states are no more effective at preventing poor contractors from getting contracts. As an example, the few contractors with which we have difficulty are all pre-qualified in the State of Washington. Washington continues to experience similar problems, despite having a large staff to review and verify pre-qualification applications. I suggest that a past performance review process to screen contractor pre-qualification needs to be cost-beneficial.

ODOT does subscribe to a federal publication listing all debarred contractors and does review that listing before awarding a contract. Also, a contractor’s bonding company looks at the past performance of a contractor prior to issuing a performance bond, which may result in either no bond being issued, or a higher premium to the contractor if past performance has been poor. For these reasons, ODOT has chosen not to add staff to review contractor pre-qualification until we are certain that the added administrative staff will be effective in eliminating the problem. With your comments and information, we will pursue an emphasis on pre-qualification.

In response to national interest to find an effective contractor pre-qualification process, there is currently underway a national study by the Pennsylvania Transportation Institute for quality based pre-qualification. Although they have also struggled with effective measurement in the pre-qualification arena, the findings of this report, when completed, may provide ODOT additional direction for effective pre-qualification. We are closely following this research.

Design Estimate

In the project design area, I would like to caution that the use of the terminology “design error” may cause confusion and overstates what is really an “overestimate” or “underestimate” of a bid item’s quantity or cost. Engineers generally use the term “design error” when a major design element is omitted or a significant design element has to be reworked once the contract is let. Neither was the case in your findings. It’s also important to note that several years ago ODOT decided to reduce the design and specifications review as a way to reduce project delivery times and to reduce preliminary engineering costs. This may lead to modest increases in construction costs, but probably will not increase overall costs because faster delivery will offset this shift in costs.

June 26, 1998
Mr. John Lattimer

Total Project Cost vs. Contractor Payments

ODOT has historically measured construction cost performance by comparing the final construction cost to the original construction authorization. The authorization includes the contractor's bid amount, an amount for contingencies equal to 4.5 percent of the bid amount and an amount for construction engineering. The final cost relative to the total construction authorization has averaged approximately 99 percent in recent years, which we believe is right on target. We feel that looking at the total construction budget gives a more complete picture of cost performance than looking only at the amount paid to the contractor, particularly because some contracts include bonuses for exceeding certain specifications that relate to project quality and time. You may be interested in knowing that given our consistent underruns of overall construction budgets, we have decided to lower the contingency percentage in contracts from 4.5 percent to 3.5 percent. This will free dollars in advance for additional construction work.

I appreciate your research that verifies ODOT is better than most states you reviewed for contractor payments over bid. Regarding the recommendations, we will work closely with the national study, the legislature, the Association of General Contractors and the public to continue to seek improved methods of cost-effective and timely contracting. This review by your office will help direct those efforts.

Thank you for the review of our highway construction program, your recommendations and your findings on positive management of this program.

Sincerely,

Grace Crunican
Director

FACTS ABOUT THE SECRETARY OF STATE AUDITS DIVISION

The mission of the Audits Division is to “Protect the Public Interest and Improve Oregon Government.” The Oregon Constitution provides that the Secretary of State shall be, by virtue of his office, Auditor of Public Accounts. The Audits Division exists to carry out this duty. The division reports to the elected Secretary of State and is independent of the Executive, Legislative, and Judicial branches of Oregon government. The division audits all state officers, agencies, boards, and commissions and oversees audits and financial reporting for local governments.

DIRECTORY OF KEY OFFICIALS

Director

Deputy Director

Deputy Director

John N. Lattimer

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This report is intended to promote
the best possible management of public resources.



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