An Audit Report on

Management Controls at the Texas Department of Transportation

Office of the State Auditor
Lawrence F. Alwin, CPA

November 1994

Report No. 95-021

Key Points Of Report

An Audit Report on Management Controls at the Texas Department of Transportation

November 1994

Key Findings

- The Department could potentially save $6.2 million per year in preliminary and construction engineering activities. Savings could be achieved by reducing the amount of preliminary and construction engineering costs at the districts.

- The efficiency of overall maintenance operations can be measured more effectively for evaluation purposes by management. There are potential cost savings of $5.9 million which can be achieved by reducing cost per unit.

- Some districts are not performing efficiently in administrative functions. In addition, district and division managers do not have comparative information to evaluate the efficiency of administrative functions. Increased efficiencies could result in potential cost savings of over $900,000 per year.

- District internal auditors are not used effectively to encourage efficiency, ensure that controls are in place, and ensure that data is accurately and consistently generated and recorded at the district level. This creates "ad hoc" audit functions because managers cannot be assured that adequate controls are in place to ensure the quality of both processes and information.

- Contractors' monthly assessment is not linked to the contract awarding process. Contractors who receive poor performance ratings can subsequently contract with the Department for future construction projects.

Contact:
Leo Paterra, Audit Manager (479-4715)

This management control audit was conducted in accordance with Government Code, Section 321.0133.

Table of Contents

Table of Contents, continued

Table of Contents, concluded

Executive Summary

The Texas Department of Transportation (Department) underwent a major reorganization due to the retirement of 1,370 employees at the beginning of fiscal year 1994. A new executive director, with his senior management team, took over Department operations on October 1, 1993. Although the Department has begun many initiatives to increase efficiency of operations, to ensure adequate oversight and allocation of resources, management controls over the evaluation of operations should be strengthened.

Review of district operational efficiency in construction, maintenance, and administrative functions indicated an opportunity for potential cost savings of over $13 million. The actual cost savings realized by the Department could be less or greater.

Management Does Not Have All The Information Needed To Manage Preconstruction Activities

Our evaluation of preliminary and construction engineering activities yielded a potential cost savings of $6.2 million and indicates that evaluation of preconstruction activities should be strengthened. Savings can be achieved by reducing preliminary and construction engineering costs at the districts. District information as it relates to preconstruction activities should be identified, compared, and used to evaluate performance.

There is not a process to assess the accuracy of construction design work. Since reasons for changes to the plans are not tracked, the Department cannot assess the work of those preparing the plans for subsequent construction. Problems with a project's design can result in higher costs due to changes during construction.

The Department has a schedule to determine what construction projects will be awarded each month. However, they do not have the information or a process to track how well they met the schedule. Since districts schedule their preconstruction work around this date, the Department may not be able to plan or adjust resources when unforeseen events delay a project.

The Department has begun an effort, called *Retooling TxDOT*, which is identifying business functions, processes, and activities. Plans to compare information needs with existing systems are to be a part of this effort, as well as the development of deliverables to address information gaps.

Accountability Can Be Improved Through The Evaluation Of Maintenance Operations

Although evaluation tools exist within the maintenance function at the Department, they can be expanded to enhance accountability at the district level. By comparing the costs of a selected maintenance activity in a district with similar districts, $5.9 million in potential cost savings were identified.

Opportunities for improvement in maintenance evaluation exist relating to review of equipment usage, analysis of employee classifications, and allocation of maintenance overhead. In addition, there is an opportunity for the Department to enhance evaluation and planning through improved management of district maintenance budgets.

Increased Efficiencies Are Possible In District Administrative Functions

The district administrative functions of voucher processing, accounting, human resources, warehousing, and purchasing were evaluated to identify over $900,000 in potential savings. While over $20 million per year is spent on employee salaries and benefits for these functions, managers do not have the information needed to evaluate the efficiency of these functions.

Certain activities, such as sending hard copies of vouchers to Austin for filing and sending vendor warrants to districts for mailing, can be eliminated in order to reduce processing costs.

The Department May Not Effectively Use The Independent Assessment Capability Of The District Internal Audit And Construction Review Functions To Evaluate Performance

The role of district internal auditors is largely determined by the district engineer and varies from district to district. Changes to workload, automation, and control environment have created opportunities to increase the efficiency and effectiveness of district internal auditors. More clearly defining the role of district internal audit should eliminate "ad hoc" audit functions that might be created to ensure that controls are in place.

The monthly assessment of contractor performance is not linked to the contract awarding process. Contractors with poor performance ratings can contract with the Department for future construction projects. In addition, some contractors are assessed liquidating damages in more than one district or for more than one project. Liquidating damages may result in additional work days which can cause delays in project completion. This may contribute to traffic delays and inconveniences to the traveling public.

The Department Needs To Improve Management Of Information Resources Over Two Systems

Management of information resources over two systems can be strengthened. The Department has not completed the plan for the future operation of the Registration and Title System. Also, the Department has spent a total of $320,000 on the Bid Analysis Management System, although the specific benefits of the system are unknown.

The Monitoring Process For Texas Transportation Plan Should Be Improved; Adequate Progress Has Been Made On 1989 Strategic Mobility Plan Recommendations

Although the Department is making adequate progress in developing the Texas Transportation Plan, formal procedures to ensure the quality and accuracy of the data of the technical components are minimal. Quality is necessary to provide the Department with a document that they can build upon for future plans.

The Department has made significant progress in implementing the recommendations contained in the State Auditor's Office review of the 1989 Strategic Mobility Plan (SAO Report Number 2-017). Procedures to review the mathematical accuracy and completeness of the data need improvement. The Strategic Mobility Plan is no longer used by the Department, although some of the information has been incorporated into the Department's Strategic Plan.

Summary Of Management's Responses

The results of this audit will be used as input to ongoing cost reduction and efficiency initiatives. As recommended, the Department will use the presented methodology to refine their methods and assumptions as necessary for practical utilization. The Department feels the methodology is already being used in different areas throughout the Department.

As reflected in the Department's detailed response, cost controls and performance measures must factor in the many differences and variables of the organization. Without the consideration of differences and variables, the cost comparisons may be less meaningful.

Summary Of Audit Objectives And Audit Scope

The objective of this audit was to evaluate the existing management control systems within the Department of Transportation and to identify opportunities for improvement.

The scope of the audit included consideration of the Department's construction, maintenance, and administrative operations; management of information resources; construction contract monitoring; role of internal audit; and planning processes.

This page is intentionally blank.

Section 1:

Strengthen Management Controls Over Evaluation Of Department Functions

The Department can strengthen management controls over the evaluation of operations to ensure adequate oversight and allocation of resources. While the Department is working toward increasing efficiency and accountability, our review found over $13 million in potential cost savings. The considerable variances between the cost of performing the same functions within similar "peer" districts suggest operational inefficiencies and potential cost savings, which are detailed later in this report.

The Department's work focuses on both efficiency and effectiveness (Figure 1 discusses each) and could result in a performance measurement process using both internal and external "best performance" standards as part of a benchmarking process.

We used available Department information to target areas for potential savings through greater efficiency. While focusing on efficiency, we did note related effectiveness factors when appropriate.

Figure 1

EFFICIENT/EFFECTIVE

While the efficiency of a process often focuses on cost and effectiveness with quality, in practice the two are interrelated. For example, the construction design process for a freeway can be efficient - completed on time and within budget - but if design errors create delays and cost overruns during construction, the design process was not effective.

The types of questions asked for each are:

Efficiency:

- Can employee productivity increase?
- Can the cost of materials and inventory be reduced?
- Can administrative costs be reduced?

Effectiveness:

- Are quality standards maintained?
- What are the exception/error rates?

Section 1-A:

Evaluation Of The Efficiency Of Key Functions Identified Total Potential Savings Of Over $13 Million

Selected district construction, maintenance, and administrative functions were evaluated to identify over $13 million in potential cost savings. Because these are recurring savings, this would amount to $26 million in potential cost savings for the biennium.

The savings identified were the result of a conservative methodology, based on comparing districts to a peer group weighted average or median standard rather than a "best performance" standard. We identified potential savings by

The savings presented in this report are considered potential savings since our methodology identified practices which indicate below average performance, but did not identify the specific changes which should be made.

The actual cost savings realized by each district could be less or could even be greater. We compared each district with the average performance in its peer group, not the best performance in the peer group.

comparing workloads among districts within the same Department peer groups (Figure 2). We used available Department information to develop evaluation techniques which are currently not used.

A workload standard based on the best performance of more efficient districts or external entities could increase savings. The process of comparing performance to best performance is called "benchmarking," which is a measurement process that results in comparative performance measures. Examples of best performance can occur both internally and externally.

Figure 2

DISTRICT PEER GROUPS

Metro	Urban	Rural
Austin	Beaumont	Abilene
Dallas	Corpus Christi	Amarillo
Ft. Worth	El Paso	Atlanta
Houston	Lubbock	Brownwood
San Antonio	Pharr	Bryan
	Tyler	Childress
	Waco	Lufkin
		Odessa
		Paris
		San Angelo
		Wichita Falls
		Yoakum

Source: Based on peer groups as outlined in standard district organization chart.
Since we used fiscal year 1993 data, the Laredo district, which officially began operation as of 9/1/93, is not included. The Laredo district is in the rural group.

The Departmental peer groupings of districts (metropolitan, urban, and rural as presented in Figure 2) provide a ready-made basis for internal identification of best performance. These groupings also provide a means to ensure that evaluative information is reported consistently across the districts -- critical for valid comparisons. The identification of internal best performance then provides a basis for comparing that standard to external performers.

Without collecting information to measure performance, against internal or external standards, it is difficult to evaluate the efficiency of various functions. Although information is available for some functions and informal sharing of information occurs, the detailed comparative information needed is not readily accessible. We accumulated information from various Department sources, including information systems and questionnaires, to perform our evaluation.

The potential savings identified are listed below by type, amount, and related report section for the functions evaluated.

▸ Construction:	$6.2 million	Section 2
▸ Maintenance:	$5.9 million	Section 3
▸ Administration:	$.9 million	Section 4

WE FOCUSED ON DISTRICTS

Although districts were the focus, the methodologies applied to selected district construction, maintenance, and administrative functions can also be applied at the division level as well. For example:

- The cost of division support could be compared to the cost of district service delivery.
- The performance of the division voucher processing, human resource, warehouse, purchasing etc., functions could be evaluated and compared to similar district operations.

The following presentation focuses on potential savings and provides a tool to be further developed and used to make informed decisions about resource allocation, in terms of workload, for these functions. The savings presented in this report are considered potential since our methodology identified district practices which indicate below average district performance for the selected functions reviewed but did not identify the specific changes which should be made. Although fiscal year 1993 data was used to identify potential savings, a review of fiscal year 1994 information through April 1994 indicated that wide variances in the functions reviewed continued.

Section 1-B:

The Department Is Working To Find Cost Savings Through Increased Efficiency And Has Made A Commitment To Operate Like A Business With Increased Accountability

To move towards the Department's goals of increased accountability and efficiency, committees have been formed and directives issued to "jump start" the process of evaluating Department functions. Current initiatives, to be completed by the end of the year, emphasize this commitment:

- A District Efficiency Task Force is focusing on the construction, maintenance, and administrative functions.
- An executive directive ordered a 20 percent reduction in travel expenditures and the elimination of nonessential meetings.
- The *Budget Efficiency Effort* has developed action plans and completion dates for recommending actions, policies, and procedures to optimize the:
  - size, equipment types, location, and use of all major equipment
  - management of warehouse and roadway material inventories
  - management of overtime

The Department's work will be difficult. The evaluative linkages needed to take advantage of the potential for increased accountability and efficiency through peer comparisons have not been developed. Although the considerable data generated by 25 districts should provide the information necessary to evaluate performance, this has not been the practice in the past.

Comparative data has generally not been developed or used to compare district operations in terms of efficiency. Historical practice seems to have defined district "autonomy" as also extending to the sharing, and use of, comparative information.

Current leadership is addressing the need for accountability, including the use and sharing of comparative information. Autonomy is more appropriately defined in terms of decision-making, rather than accountability. Although the retirement of the Department's key executive managers and over half of the district engineers reduced the Department's historical knowledge base, this change provides an opportunity for the introduction of new ideas and perspectives.

Recommendations:

1. Continue the Department's commitment to both the elimination of inefficient practices and the longer term development of a comprehensive evaluation process. Use the methodology developed by the State Auditor's Office as a starting point for an evaluation process. Refine the methods and assumptions, as necessary, for the functions reviewed and include other functions not reviewed in the evaluation.

2. Start identifying the information and processes needed to develop the Department's best performance standards to be used to evaluate the maintenance, construction, administrative, and other functions. This information should be used as the basis for comparing district performance to those standards. Whether the Department uses peer groups or all districts depends on the function being evaluated. Figure 3 below depicts that process.

Figure 3

EVALUATION MODEL: INFORMATION AND PROCESSES TO MEASURE: ▸ EFFICIENCY ▸ EFFECTIVENESS	
DEPARTMENT/DIVISION	**DISTRICT**
1. Develop evaluation policies/procedures. 2. Determine benchmark, best performance, standards: • internal • external 3. Establish the evaluation process.	
4. Gather/enter data from external sources.	4. Gather/enter data at each district.
	5. Submit data to division.
6. Develop/report comparative information and distribute to districts.	
7. Evaluate and recommend action.	
8. Make adjustments (resource allocation and other) among districts.	8. Make adjustments (resource allocation and other) within each district.

Management's Response (1 & 2):

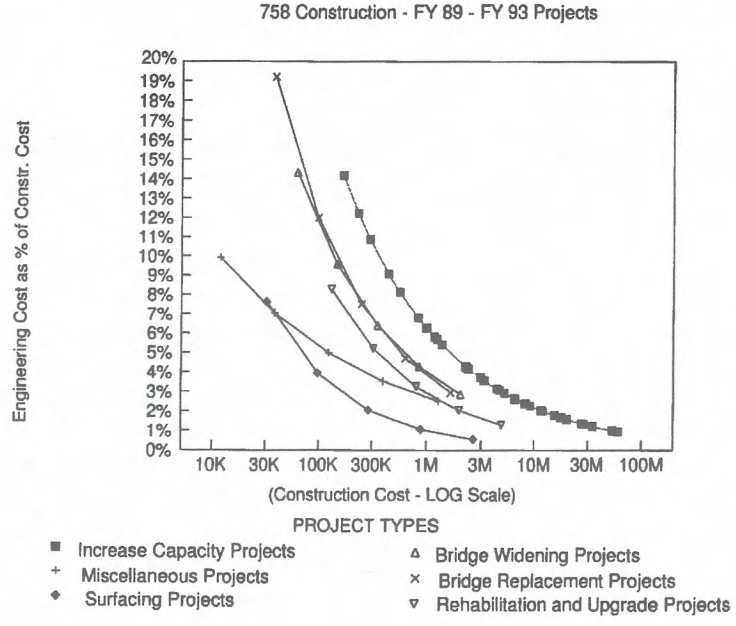
We whole-heartedly agree with the direction of the recommendations. We are looking into all areas of operations by developing Continuous Improvement methods that return the greatest benefit in the least possible time. The Budget and Finance Division is using these methods on the three current Budget Efficiency Action Teams. Subsequent to the end of SAO's field work, the Budget Efficiency Action Teams began to follow up on the SAO's work. Internal and external benchmarks are also being used to compare TxDOT's equipment replacement criteria with other states and private businesses. Other external comparisons are being attempted with other states' commodity specifications.

To underscore the commitment of TxDOT to these efforts, a formal performance goal has been established: "Maximize the budget efficiency studies to provide cost reduction for TxDOT and develop a routine process to review efficiency on a continuing basis."

Additionally, under the Intermodal Surface Transportation Efficiency Act, TxDOT is developing more substantive measures which are results oriented. For example, improved congestion index in urban areas, pavement performance scores, bridge ratings, public perceptions, etc. Many of these new and progressive programs will be in full implementation in the next three to five years and will be able to give legislative, executive, and administrative decision-makers support capability that heretofore have not been available. These measures will help in managing and allocating resources. Also, it should be noted that the House Appropriations Subcommittee chaired by Representative Henry Cuellar used TxDOT's budget measures as an example of good performance measures during fiscal year 1994.

While we agree with the direction of the recommendations, we have found that the use of simple average type standards is misleading. For example, we have recognized that historically, preliminary engineering costs per million dollars of construction decreases as construction cost increases and varies with project complexity or type. The following chart illustrates these relationships.

PRELIMINARY ENGINEERING COST as % of CONSTR. COST



Section 2:

Management Does Not Have All The Information Needed To Manage Preconstruction Activities

Evaluation of the Department's construction operations should be strengthened. Our evaluation of preliminary and construction engineering activities yielded a potential cost savings of $6.2 million. Additional information and evaluation processes are needed in the various phases of preliminary and construction engineering. Comparative information is needed to compare and evaluate district performance as it relates to preconstruction activities. There is not a process to assess the accuracy of construction design work. If designs are not accurate, they can result in increased construction costs. In addition, information to assess how well the Department is meeting its schedule for awarding of construction contracts is not available.

Appropriate methods of evaluation would include processes or systems that would indicate to management the status of a project. These procedures could help identify where problems may exist so that corrective action can be taken. Without a process to evaluate construction activities, the Department may not be able to adequately plan, improve, and allocate resources. Additional tools and closer monitoring is necessary for preconstruction because delay factors in this stage can be barriers to timely project completion.

The Department has initiated an effort, called *Retooling TxDOT*, which is identifying business functions, processes, and activities. Plans to compare information needs with existing systems are to be a part of this effort, as well as the development of deliverables to address information gaps.

Section 2-A:

Reduction Of Costs In Preliminary And Construction Engineering Generates A Potential Savings Of $6.2 Million

Figure 4

Preliminary and Construction Engineering Potential Savings ($ in millions)		
Peer Group	Potential Savings	% Preliminary and Construction Engineering to Construction
Metro	$.5	9.5% - 11.4%
Urban	$3.9	5.8% - 15.3%
Rural	$1.8	9.3% - 16.8%
TOTAL	$6.2	

Source: Calculations based on data from TxDOT Budget and FTE Reports

The Department could potentially save $6.2 million per year ($12.4 million for the biennium) by reducing costs in preliminary and construction engineering activities. Potential savings were identified in one metropolitan, four urban, and four rural districts. Savings could be achieved by reducing the amount of preliminary and construction engineering costs in those districts.

Only districts exceeding the following criteria as compared to the peer group weighted average were identified for potential cost savings:

- construction cost per full-time equivalent preliminary and construction engineering employee

- preliminary and construction engineering expenditures to construction contract expenditures

Figure 4 (on the previous page) shows the amount of potential savings in each peer group. The percentage of preliminary and engineering costs to construction costs ranged from 5.8 to 16.8 percent statewide, generating total savings of $6.2 million if these costs were reduced. Savings are possible for all three peer groups: the urban group is highest due to four districts being identified for potential savings. Two of these districts had savings in excess of $1 million each.

The costs incurred with the preliminary and construction engineering phases of a project should be related to the amount of construction contracting activity in a district. The expenditures for preliminary and construction engineering should be less in a district with a lower amount of actual highway construction than for a similar district with greater highway construction. However, we found that in some districts, preliminary and construction engineering costs did not appear to be related to highway construction costs.

Major Activities in Construction Operations	
Preliminary Engineering	• Prepare detail plans and specifications • Determine initial feasibility • Design of project
Right-of-Way	• Ensure clear title • Arrange for land acquisition
Contract Award	• Conduct bidding • Contract award (letting)
Construction Engineering	• Ensure quality of construction • Supervise and inspect project • Process plan changes and contract modifications
Source: TxDOT Sunset Self-Evaluation	

Although preliminary engineering work is conducted several years prior to actual construction, we used fiscal year 1993 expenditures in this analysis. This appeared appropriate after determining that the percentage of construction expenditures for 1993 was comparable to the average percentage of construction expenditures for the last five years.

This analysis allowed for evaluation of the cost of designing and managing construction projects at a high level. It should also be conducted for the more detailed activities that are performed, such as design, right-of-way, and project supervision. This will yield more specific results, identifying the exact areas within each district that can be more efficient.

Section 2-B:

There Is A Lack Of Comparative Information For Management To Evaluate District Performance

Although significant quantities of data exist in separate automated systems supporting construction activities, such as bidding, letting (award), and payment of construction contracts, it is not in a format which allows for comparability among districts. Without comparable information, it is difficult to hold districts and divisions accountable and to properly allocate resources.

In the absence of a standardized reporting system, districts have developed ad hoc systems and reports to determine the status of projects for which they are responsible. However, this data is not recorded consistently across the State, contributing to difficulties in comparison. While these systems may meet the individual district needs, they do not record and report consistent and comparable information for use by the Department or another district.

In addition, there are some instances where the information on construction is not available. Some examples include:

- the number of projects where planning and design is done, but which are never constructed and why
- the number of projects delayed and the reasons for the delays
- the quality of construction to planned and unplanned maintenance

Section 2-C:

Evaluative Information Regarding Construction Project Design Is Needed

The Department lacks the evaluative information needed to assess the accuracy of the construction design work. Without evaluative information on the accuracy of plans and estimates, the Department cannot adequately assess the work of Department personnel and consultants who perform design work for subsequent construction. The Department does not track reasons for changes to the plans (change orders). Without information on design problems, personnel designing construction projects cannot make corrections in future project designs. Design problems can result in higher costs due to changes during the construction phase.

Plans for highway construction are developed by Department employees and consultant contractors. These plans provide the specifications for building the proposed project and are used by the contractor community to bid on and construct the project.

Examples of change orders

- items not in original plans
- mistakes in original plans
- site condition that was not anticipated
- condition to benefit future projects

Throughout the course of a project there are changes to the original design. These changes are commonly referred to as "change orders." Some change orders are made appropriately for convenience or safety reasons. Others are made due to errors in the original design of the project. Change orders cost the Department in terms of time and dollar resources. There were approximately $32 million in change orders on projects completed during fiscal year 1993. Forty percent of this amount, $12.8 million, may be attributable to design problems. Change orders totaled 2.24 percent of construction expenditures for 1993.

Section 2-D:

Improve Tracking Of Dates For Letting Construction Contracts

The Department does not have the information or a process to compare the actual date a construction project is let (awarded) to an estimated letting date (the month and year in which a contract for a construction project is awarded). We were unable to evaluate how well the Department is meeting their letting dates due to a lack of useful information.

Since districts often plan their workload and track internal completion dates for design and right-of-way acquisition by the letting date for construction contracts, this date is important in evaluating district performance. Without an estimated letting date, the Department may not be able to plan or adjust resources when other events, such as a delay in obtaining right-of-way, postpone the entire project.

Various circumstances can cause a delay in a project's letting date. These include delays in environmental clearance, right-of-way acquisition, and funding. In order to use all available funds, the Department must have additional projects ready when others are unexpectedly delayed.

A current attempt by the Department to obtain additional information regarding delays in the preliminary construction phase is underway. Beginning September 1, 1994, districts are required to provide information for use in determining areas where plan preparation and review procedures can be improved. The information is designed to determine why delays in the process occur.

In addition, the Department has developed a 12-month letting schedule that should assist them in tracking estimated dates to actual dates for the award of construction contracts.

Recommendation:

1. Identify information to track the efficiency and quality of construction operations. Use this information in developing an evaluation process to identify the best performance standard for operation within each district. Ensure the efficiency and effectiveness of construction operations by holding districts accountable for their performance. Implementation of this system will allow the Department to assess performance and provide quality feedback to improve operations. Adjustments can be made to resources, allowing for more efficient operations and cost savings.

   Analysis of construction operations should be expanded to include all activities within the construction function. This should include the more detailed phases within preliminary and construction engineering, such as right-of-way, design, and contractor support. In addition, support operations for construction at both the district and division level should be evaluated in terms of the amount of resources required.

Management's Response:

The identification, management and control of preliminary engineering (Preconstruction) activities have been a significant accountability issue since the mid-1980's. Currently, engineers in the districts are beginning to use project management systems in the personal computer (PC) environment to make more informed decisions. When fully implemented, the department's Preliminary Engineering Management System (PEMS) will provide the information for project management, district management, and division managers to make better decisions concerning cash flow, timely project deliveries and affordable engineering costs. From October 1994 through February 1995, 200 engineering offices will receive PEMS training and software.

TxDOT's accounting system accumulates all project costs related to a unique identifier, the Control-Section Job number (CSJ). Accuracy in charging is stressed by TxDOT managers and all charges during a project's life for both preliminary and construction engineering are collected under the CSJ. Comparative information regarding preliminary engineering costs for various types of projects are available in the department's Preliminary Engineering Efficiency Report (PEER). Cost comparisons can be made not only within peer groups, but also within specific project types. This information is also split out by district to provide a basis for performance comparison.

Similar information is also available for construction engineering, but is not monitored to the same extent because construction engineering costs are significantly impacted based on the progress rate of the contractor and are somewhat beyond the control of the district.

Recommendation:

2. Develop a tracking system to analyze the reasons for change orders in construction projects. Use this information to provide feedback to designers of construction projects. Hold Department employees and consultant contractors accountable for the quality of their work.

Management's Response:

We will develop a method to track change orders on a test basis. Depending on the value of the results obtained, we will decide if a permanent tracking system is needed. We plan to have a tracking system implemented by June 1995. Starting in FY 1995, the dollar amount of change orders are being deducted from the district's obligation authority. This should significantly reduce field changes that are not essential.

Recommendation:

3. Use the new 12-month letting schedule to track letting dates. Analyze reasons why projects are not let according to schedule, and use this information to improve the planning process.

Management's Response:

A tracking method will be developed to provide information necessary to compare the actual letting date to the estimated letting date. This will be done on a test basis and is targeted to be implemented by June 1995. In addition, the implementation of the Preliminary Engineering Management System (PEMS) will assist the districts in setting realistic letting dates, monitoring progress toward meeting those dates, and managing resources to meet the scheduled letting date.

Recommendation:

4. Continue the *Retooling TxDOT* effort and implement an ongoing process for determining and optimizing information and the information flow to users and decision makers.

Management's Response:

We have every intention of continuing the Retooling TxDOT effort and implementing an on-going process for determining and optimizing information and information flow.

Section 3:

Accountability Can Be Improved Through The Evaluation Of Maintenance Operations

The Department's evaluation of the maintenance function needs to be strengthened. There are inefficiencies within operations relating to costs per unit of work performed of $5.9 million in potential cost savings. Although evaluation tools exist within the maintenance function at the Department, they can be expanded to enhance accountability at the district level. In total, the Department expended $545 million for maintenance in 1993, approximately 50 percent of which was contracted.

Other opportunities for improvement in evaluation exist relating to review of equipment usage, analysis of employee classifications, and allocation of maintenance overhead. In addition, there is an existing opportunity for the Department to enhance evaluation and planning through the improved management of district maintenance budgets.

Section 3-A:

Potential Savings Of $5.9 Million Could Be Realized With Increased Efficiencies In Maintenance Operations

Analysis of selected maintenance activities resulted in potential cost savings of $5.9 million ($11.8 million for the biennium) through increased efficiencies. Provided that these potential savings could indeed be realized, the Department could use these funds in other types of maintenance work. For example, based on fiscal year 1993 expenditures, the Department could pay for approximately half of the litter pickup in the State with these potential cost savings.

Figure 5

Maintenance Operations Potential Savings

Peer Group	Potential Savings by Maintenance Classification Code
Metro	110 - $174,800 120 - $11,600 212 - $372,300 241 - $137,700 242 - $12,700 511 - $14,200 711 - $184,500 Total - $907,800
Urban	110 - $876,700 120 - $46,900 212 - $511,900 241 - $54,800 242 - $36,700 511 - $39,500 711 - $150,200 Total - $1,716,700
Rural	110 - $534,400 120 - $954,900 212 - $845,700 241 - $346,600 242 - $29,400 511 - $25,500 711 - $576,600 Total - $3,313,100
TOTAL	$5,937,600

Source: Calculations based on Maintenance Management Information System Data

We were able to identify potential cost savings for 7 of 132 maintenance classifications (shown in Figure 5). Our analysis excluded expenditures for overhead and those attributable to contract work. Our methodology consisted of using the Maintenance Management Information System data and comparing the total cost per unit of work performed by district within each of the three peer groups. Using the seven codes selected, we calculated the district fiscal year 1993 total cost per unit of work performed for each function for work performed with state employees. Total cost included labor, materials, equipment, and miscellaneous. Overhead costs were not included in this analysis because the distinction between overhead applied to state employee work and contracted work could not be determined.

The seven maintenance classification codes analyzed represented 32.1 percent of fiscal year 1993 maintenance expenditures for state employee work. The maintenance classifications selected consisted of the following:

- Function 110 Base Removal and Replacement
- Function 120 In Place Repair
- Function 212 Leveling or Overlay with a Maintainer, Drag Box, or Similar Equipment
- Function 241 Potholes, Semi-permanent Repair
- Function 242 Potholes, Permanent Repair
- Function 511 Mowing
- Function 711 Paint and Bead Striping

In addition, the Department could use similar evaluation techniques to enhance the level of accountability in other maintenance classifications.

All districts would be held to the same standards developed for the Department as a whole, but decision-making at the district level could still be maintained.

District local decisions, geography, and weather conditions all impact the evaluation of the maintenance function and can make evaluation difficult. However, the Department is not using available information in a way which enhances accountability at the district level. Several available information sources used by the Department include the following:

- The Maintenance Management Information System is used to track Department and contracted costs, units of work performed, and man hours for work performed with state employees.

- The Maintenance Efficiency and Analysis Report compares cost per unit of work performed by state employees to cost per unit of work performed by contracted services.

- The Maintenance Annual Report summarizes, in chart format, the costs and the amount of work performed for each district and the State as a whole.

- The Maintenance Staffing Report details the number of employees for each district for various categories of employees. Seasonal employees are not included.

Section 3-B:

Other Evaluation Techniques Can Be Used To Evaluate Maintenance Operations

Analysis of equipment usage, employee classifications, and overhead allocations for maintenance should be enhanced and used as part of the evaluation process for maintenance operations.

Potential cost savings could be realized if infrequently used equipment were sold at the Department's carrying value. For example, it appears that there is equipment having significant values with little usage over the past 18 months. We identified 12 pieces of equipment having a cumulative Department value of over $257,000. These 12 units of equipment had a total combined usage of 49 hours since January 7, 1993.

Our methodology involved the examination of a recent Zero Usage Report prepared by the Department. This report is used by the Department's General Services Division to identify equipment within the fleet which has not been used in at least one of the past three years. However, use of the Zero Usage Report may not identify all equipment with limited usage. For example, a piece of equipment may have been used for a few hours in each of the last three years. While this piece of equipment would not appear on the report, it needs to be considered in an analysis of equipment usage. In conducting our analysis, we recognized that some equipment would need to

be on hand for emergency reasons. Therefore, we did not analyze any equipment that appeared to be of this nature unless the number of items seemed unreasonable.

The Department has taken the initiative to examine equipment; such an effort is currently underway in the Department's *Budget Efficiency Effort*. Because of this directive, we limited our review to prevent a duplication of effort.

Employee staffing levels for maintenance should be evaluated to ensure equity among districts. The Houston district appears to have significantly more than the Department's statewide average ratio of maintenance salaried to hourly employees. For 1993 and 1994 (through April 1994), we found that the statewide average ratio of salaried to hourly employees was about one salaried employee for every two hourly employees. However, the Houston district had a ratio of one salaried employee for every 1.08 hourly employees in 1993 and one salaried employee for every 1.17 hourly employees in 1994 year (through April 1994).

This district may be overstaffed with salaried personnel or may need additional hourly personnel. If the district is overstaffed with salaried personnel and could lower its number of salaried employees to just 1 salaried employee for every 1.5 hourly employees, they could reduce the district number of salaried positions by 50 positions. For example, assuming a conservative salary of $20,000 a year for each position, the Department could reduce annual salary costs in this one district by $1.4 million, including benefits. The purpose of this example is to illustrate the potential savings that could be identified by establishing such a standard.

In addition, the Department does not analyze the need for seasonal employees, but delegates this responsibility to the districts. Limited analysis of workloads by month indicated that not all districts needed seasonal employees. Almost all districts hired seasonal employees for maintenance in 1993. One district stated that the number of seasonal employees hired every year is based primarily on the available budget. We identified that the Department had more than 1,000 seasonal employees working in maintenance during June and July 1993. The lack of evaluation with regard to seasonal employees indicates that cost savings might be possible.

Another area where evaluation could be improved relates to the distinction between overhead applied to contracted work and work performed by state employees. The Department cannot adequately compare the cost of maintenance work performed by state employees to the work performed by contractors. The Department tries to make this comparison on the Maintenance Efficiency and Analysis Report, but due to the allocation of overhead between work performed by state employees and contractors, this is not done correctly. The amount of overhead which should be applied to contracted maintenance work is not identified; therefore, overhead is excluded completely from the comparison.

Currently, the Maintenance Management Information System puts all of the overhead in the state employees category. The inclusion of all overhead inflates the cost of work performed by state employees. Because of this recognized concern, the Department does not include overhead when comparing total costs for state employee

work to total costs for contract work on the Maintenance Efficiency and Analysis Report. The problem with this approach is the cost to contract already includes the contractor's overhead, which is built into their contract price. The cost to use state employees does not include overhead incurred by the Department and, thus, the comparison is inaccurate.

Recommendation:

1. Develop an evaluation tool which incorporates efficiency and quality measures. Peer groups should be established for evaluation purposes. An effective evaluation tool which includes both of these measures would identify districts which have a high cost and a lower level of quality. This will assist the Department in identifying those districts who can adjust resources and generate cost savings. This tool should be used to evaluate all maintenance classifications.

Management's Response:

A research project is underway that will recommend a process to evaluate different components of the highway system. When historical information on overall system condition is available, a better comparison of efficiency and effectiveness can be performed. As new information becomes available, we will continue to use it as a management tool.

Management's assessment of district accountability in the maintenance arena is done through evaluating the sufficiency of the roadways in view of budget and human resource allocations.

Recommendation:

2. Maintenance management should integrate the use of the Zero Usage Report and a report on equipment with low usage in the evaluation process as it relates to maintenance. In addition, this information should be shared with all districts to assist them in planning future needs and equipment action plans.

Management's Response:

The four maintenance reports referenced are being used within each district where it can best be used. The executive director has emphasized to our district engineers to dispose of surplus equipment and free investment for appropriate use. Additionally, one of our Budget Efficiency Action Team studies is addressing equipment cost savings opportunities.

Recommendation:

3. Enhance staffing standards to prevent inequities in the ratio of salaried to hourly employees found in the districts. Improvements can be made through future hiring practices and adjustment of current inequities.

   Develop an evaluation methodology which would justify the hiring of a specified number of seasonal employees for each district. The Department should take an active role in monitoring these employee levels and ensuring that this program is used effectively. Work performed, total cost per unit, or other measures of productivity could be useful tools in measuring the levels of seasonal employees needed.

Management's Response:

Hourly and salaried employee levels in Maintenance, as well as seasonal employment, will be evaluated by the recently appointed Optimum Staffing Task Force Team. The results are targeted to be available to use in the hiring of 1995 summer employees.

Recommendation:

4. In order to accurately compare the two types of work, the Department must develop a methodology to identify the overhead which is truly attributable to state employee work and contracted work. The overhead attributable to state employee work should be added to total cost for state employee work. Also, the State's overhead for monitoring contracted work should be included in the total cost for using contracted services for the comparison on the Maintenance Efficiency and Analysis Report.

Management's Response:

Work is in progress at this time to address this recommendation. Implementation is scheduled for the second quarter of FY 95.

Section 3-C:

Emphasize The Importance Of Continually Monitoring Routine Maintenance Projects Throughout The Year

The Department's maintenance function is operating in an environment where maintenance managers face the possibility of losing excess maintenance funds at year end if the funds are not spent. Any unused maintenance funds at the end of the fiscal year are transferred to the Department's highway construction function. This

condition of "use or lose" funds occurs in many agencies and is, therefore, not isolated to the Department.

In the past, maintenance funds were budgeted to the districts based in part on historical cost. Therefore, if a district did not use all available maintenance funds in a fiscal year, their budget for the next fiscal year was reduced. The effect on districts can include spending funds to avoid losing the current dollars or being forced to spend the following year's funds on projects not completed in the current year. Spending funds at the end of a fiscal year to avoid losing them may not be the most appropriate use of these funds for the Department as a whole.

This arrangement can create a budgeting and funds monitoring problem for personnel responsible for planning routine maintenance projects. Unpredictable factors, such as weather, combined with an increasing use of private contractors and the time required to contract out a project, impact the Department's ability to schedule and complete maintenance projects within a given year.

Management's review of project status, expenditures, and available funds is critical to ensure that routine maintenance goals are met. In performing this review, maintenance managers must emphasize the importance of planning and budgeting maintenance needs throughout the year.

Recommendation:

Emphasize the importance of planning and monitoring routine maintenance projects and the status of expenditures throughout the year. Consider budgeting maintenance operations on a basis other than historical cost. If determined to be necessary, develop a process which would be considered the minimum acceptable level of monitoring performed by districts.

Management's Response:

Districts do monitor their budgets throughout the fiscal year and, monthly, they provide expenditure projections by month to our Budget and Finance Division for cash forecasting purposes.

Budgets are allocated based on needs. Needs are determined by using as much data as possible including: district requests, inventory, pavement conditions and historical expenditures. The operating budget for fiscal year 1995 and the Legislative Appropriations Requests for fiscal year 1996 and fiscal year 1997 started at the lowest department levels with evaluations and review by the district/division, the Senior Management Team, the Executive Director, and the Commission.

Section 4:

Increased Efficiencies Are Possible In District Administrative Functions

Selected district administrative functions were evaluated to identify over $900,000 ($1.8 million for the biennium) in potential savings. This is a conservative estimate of the potential savings possible if the productivity of district voucher processing, human resources, accounting, warehouse, and purchasing functions were increased. Over $20 million per year is spent on employee salaries and benefits for these functions, yet managers do not have the information needed to evaluate the efficiency of these functions.

The following presentation focuses on potential savings and provides a tool to be further developed and used to make informed decisions about resource allocation, in terms of workload. Although our presentation discusses voucher processing as a separate process and the other administrative functions collectively, the functions reviewed are interrelated. For example, a large number of small dollar purchase orders would increase the workload and cost of both the purchasing and the voucher processing functions.

A weighted peer average was calculated for district voucher processing, accounting, human resources, warehouse, and purchasing functions. This approach provided a conservative standard by which to evaluate staffing and recognizes that administrative processes are fairly standard, therefore, measuring and reporting performance can be routinized. For example, while an increased workload may be created by a flurry of retirements or end of the year activities, the processes involved are standard, and the need for staffing adjustments can be identified as either short- or long-term.

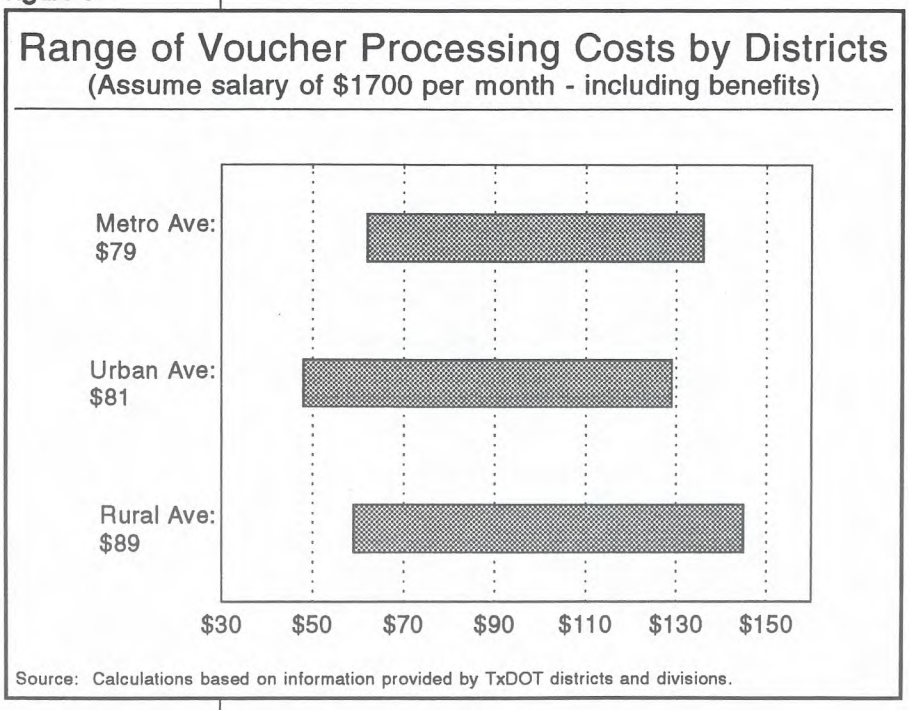
Section 4-A:

Increased Efficiency, To Reduce The Cost Of Processing Vouchers, Could Save $490,000 Per Year

The wide range in fiscal year 1993 district voucher processing costs, from $48 to $145 a voucher, is a clear indication that certain districts are not performing efficiently. District size did not seem to be the primary factor in determining efficiency. Although most metropolitan (larger) districts were among the more efficient, they were not necessarily the most efficient. Three urban districts and one rural district appear to be more productive, based on processing costs, than any metropolitan district.

Five rural districts process vouchers for less than the average metropolitan district processing cost. Conversely, at least one district in each grouping had processing costs close to $130 per voucher. Figure 6 (on the following page) includes costs by district. The three lines in Figure 6 show the range of costs by district peer group.

Figure 6



Our calculations assumed a standard salary of $1,700 per month and include employee benefits. Using the weighted average for each grouping (metropolitan, urban, and rural) as a peer standard, only those districts processing both a fewer number and dollar amount of vouchers per employee in fiscal year 1993 were considered inefficient. To verify our analysis, we compared the number of items processed by district, as reported by the Department's Voucher Processing Section, to our results. A similar number of inefficient district voucher processing functions were identified using this alternative source of information.

Our conservative approach identified potential cost savings by comparing productivity to peer averages. Actual cost savings could be more or less. Holding all districts to the standard created by more productive districts would increase the potential for cost savings.

Figure 7

POTENTIAL SAVINGS IF INEFFICIENT DISTRICTS BROUGHT UP TO VARIOUS EFFICIENCY RANGES	
Average Cost to Process a Voucher	Potential salary savings with benefits
$100	$83,800
$90	$218,900
$80	$356,400
$70	$491,100
Source: Calculations based on data provided by Districts and Divisions.	

Figure 7 shows the potential savings if inefficient districts reduced their processing costs to $100, $90, $80, and $70 per voucher. Ten districts were identified as inefficient, including a minimum of two districts from each peer grouping.

We could not determine if centralizing voucher processing at the division level would be more efficient. There is no evidence to suggest that the division level voucher processing unit processes similar categories of vouchers more efficiently than many of the districts.

As discussed in Section 1, the eventual solution is the creation of an evaluation system with workload data for key functions, including voucher processing. Productivity could then be measured

and action taken as necessary. In the short term, certain measures could be taken immediately to reduce processing costs.

- Districts could stop sending copies of the more than 35,000 vouchers, plus supporting documentation, processed annually to Austin. Currently, districts keep copies in their files, with Austin also keeping copies. Since the voucher is generated from the automated system, it can be accessed from Austin; a hard copy is unnecessary in Austin.

- Vendor warrants could be sent directly from Austin, rather than sent to the districts for mailing. Since payment is noted in the automated system, the practice of attaching a hard copy of the warrant notice to the voucher file copy is unnecessary in the districts.

Simple efficiencies can yield savings. Using the voucher example above, if we assume that 20 vouchers an hour can be copied and prepared for mailing, the annual salary cost is over $25,000. This does not include savings attributable to mailing and equipment costs.

Section 4-B:

The Cost Of Selected Administrative Functions Could Be Reduced By Staffing To Peer Average Staffing Patterns

We compared the workload for human resources, purchasing, warehouse, and accounting (non-voucher) functions against a weighted peer group standard among districts. Figure 8 (on the following page) shows the wide range of district productivity in terms of the workload measures for each function. As with voucher processing in Section 4-A, the wide variance pattern of employee and performance ranges seems to indicate significant opportunities for increased efficiency.

Savings of over $417,000 could result from bringing these four administrative functions up to the weighted peer average within each peer group. The ranges are presented in the Figure 8. Bringing them up to a higher best performance standard could provide further savings.

Figure 8

WORKLOAD RANGES FOR FOUR ADMINISTRATIVE FUNCTIONS

	PEER GROUP	EMPLOYEE RANGES (A)	RANGES BY MEASURE USED (B)
HUMAN RESOURCES		Range	District FTEs/Employee
	▸ Metro	2.9 - 6.0	112 - 351
	▸ Urban	1.0 - 7.0	63 - 446
	▸ Rural	1.0 - 5.0	74 - 227
WAREHOUSE		Range	Transactions/Employee
	▸ Metro	5.4 - 17.4	2,047 - 4,385
	▸ Urban	2.8 - 9.0	1,763 - 6,149
	▸ Rural	1.5 - 5.0	2,120 - 11,105
PURCHASING		Range	Purchase Orders/Employee
	▸ Metro	4.3 - 12.0	655 - 2,128
	▸ Urban	2.3 - 7.0	1,132 - 2,714
	▸ Rural	2.0 - 5.7	876 - 3,589
ACCOUNTING		Range	District FTEs/Employee
	▸ Metro	3.0 - 15.0	110 - 218
	▸ Urban	0.5 - 5.6	80 - 811
	▸ Rural	1.0 - 4.0	77 - 338

(A) Range of Employees: The range of employees in each function by peer group. For example, in the metropolitan peer group the district with the lowest number of human resources employees had 2.9 employee equivalents, and the district with the highest number had six.

(B) Ranges by Measure Used: The range of the measure used to evaluate each function by peer group. For example, in the metropolitan peer group for human resources the measure used was total district FTEs per human resources employee. The metropolitan peer group with the lowest number had 112 total district FTEs to one human resources employee. The district with the highest had a ratio of one human resources employee per 351 total district FTEs.

Source: Data provided by the districts and reports from the purchasing, voucher processing, warehouse, and budget divisions.

Potential savings were calculated by a collective consideration of the four functions. This collective presentation accounts for district differences in the assignment of functional responsibilities. Our interview and questionnaire responses indicated that the line between functions may not be consistently drawn, with responsibility for certain tasks varying by district.

Section 4-C:

Department Managers Do Not Have The Information Needed To Evaluate The Efficiency Of District Administrative Functions

Without comparative information, district and division managers cannot compare district performance among districts or to an external standard. Hence, it is difficult to evaluate the efficiency of administrative functions. Although information is

available for some functions (see Figure 9) and informal sharing of information occurs, the detailed comparative information needed is generally not available.

Figure 9

SOME EVALUATIVE INFORMATION IS SENT TO DISTRICTS.

- Districts are sent information about warehouse performance. We compared transaction data from this report to the number of employees per district.
- The Department's Voucher Processing Division sent out timing reports during fiscal year 1993. When reprogramming for the new Uniform Statewide Accounting System is completed, they will continue the mailings.

Our approach indicates opportunities for savings. Some districts are clearly performing at a more efficient level. Expanding and improving our approach could provide the information and the basis for a process to allocate resources for administrative units and to improve accountability. This approach, and the types of information used, could provide the best performance standards and comparative information which are essential to functional evaluation. As discussed in Section 1-B, the Department has indicated a commitment to this course of action.

Recommendations:

The audit process has included the sharing of information with members of the teams supporting the Department's efficiency initiatives. Our recommendations complement their work and could be performed concurrently to achieve timely cost savings through greater efficiency. District expertise should be used in implementing the recommendations. Specific steps could include the following:

1. Create a comprehensive evaluation system for the organizational units reporting to the District Director of Administration. This system would include performance standards to determine both efficiency and effectiveness, with district workload and staffing information an integral part of the system. This information can be used to both evaluate and allocate resources. Include the following:

    - Each district should account for all FTEs reporting to a Director of Administration in terms of the percent of time spent by function.
    - Within each district peer group, establish the workload standard to be used for evaluation. This should be a two-stage process. First, establish a process for determining district "best performance" standards. This could be within peer groupings.
    - When that process is in place, and data accuracy has been determined, establish a process for determining best performance external standards. Based on the standards to be used, develop the data collection and reporting methodology necessary to report district

performance. The data should include the FTE information discussed above.

2. Expand this process to related division functions to provide performance options. For example, a decision to centralize voucher processing should only be made if division/district performance data indicates it would be cost effective. This would allow considerations of other options as well. For example, more efficient districts could also assume the processing responsibilities of less efficient districts.

Management's Response (1 & 2):

The department has recently appointed a team of division and district employees, the Optimum Staffing Task Force, to evaluate staffing levels in all areas of TxDOT to optimize efficiency. The four areas addressed in the report will be part of the overall study. The initial recommendations of the task force should be complete by April 1, 1995.

Recommendation:

3. Consider mailing vendor warrants directly from Austin, rather than sending them to the districts for mailing.

Management's Response:

This basic idea of sending warrants directly to vendors has been considered in the past, and we will reevaluate the issue.

Recommendation:

4. Consider stopping the practice of mailing copies of vouchers, and supporting documentation, to Austin. Shift the responsibility for voucher accuracy to the districts. District internal reviewers should assume responsibility for ensuring the district control systems will detect and correct errors at the district level.

Management's Response:

This basic idea has been considered in the past prior to the implementation of Uniform Statewide Accounting System (USAS). It seems appropriate to reevaluate the idea again now. Differences in the way we handle vouchers in USAS will have a significant impact on the results of such a review.

Recommendation:

5. Take advantage of the opportunities created by a changing automated and procedural environment to reassess staffing and control patterns. An assessment of the purpose of each function might indicate that responsibilities should be shifted and staffing assignments combined or realigned to increase productivity while ensuring adequate controls and staffing for efficient and effective operations.

Management's Response:

Retooling TxDOT, the implementation phase of the Business and Information Systems Plan (BISP), will review the functions and processes of the department, including responsible organization units. It is anticipated that the department's staffing assessment and control patterns will be analyzed within the study of the human resources area of the department. Human resources is one of fourteen anticipated major areas to be pursued within implementation of the BISP.

At an aggregated, strategic level, the department's Senior Management Team and selected offices are beginning to use information technology to monitor broad efficiency and effectiveness measures through the use of an executive-level decision support system. The system is targeted at strengthening executive-level decision making at both strategic and operational levels, and enhancing the management and control of key department resources.

Section 5:

The Department May Not Effectively Use The Independent Assessment Capability Of The District Internal Audit And Construction Review Functions To Evaluate Performance

Using independent assessments provided by internal auditors and construction contract reviewers is the critical final step in the evaluation cycle. This independent evaluative information provides a basis for measuring performance and taking action, whether directed towards internal or contracted operations.

While the internal audit function addresses controls and performance across the spectrum of district operations, construction contract review is focused on a specific type of purchased service. Both important functions are discussed in more detail below.

Section 5-A:

Use District Internal Auditors To Ensure That The Staff Reductions Created By Increased Automation Are Realized And That The Controls Needed To Ensure Data Integrity Within This New Environment Are Developed[1]

District internal auditors are not used effectively to encourage efficiency, ensure that controls are in place, and ensure that data is accurately and consistently generated and recorded at the district level. Determining opportunities for increased efficiency and effectiveness, in terms of both workload and the control environment, are within the traditional internal audit role.

As more functions are automated and policies change, the Department should consider two levels of risk which district internal auditors should address. The first is that as automation eliminates or shifts workload, unnecessary tasks will be created to generate workload for employees whose tasks have been eliminated or shifted to another department. Three workload reducing examples, two of them created by increased automation, are discussed below.

- Raising the minimum dollar amount of inventory recorded on the small equipment inventory reduced the number of items on the inventory and the time required to inventory. If employees responsible for inventorying are allowed to take the same amount of time to inventory the reduced number of items, the savings are lost.

- Introduction of the Single Entry Screen eliminates the need for maintenance offices to send hard copies of time sheets to accounting employees. If the accounting employees who previously received the maintenance time sheets continue to "audit" those time sheets, the savings are lost.

- The Automated Purchasing System will automatically match purchase orders with receipt documents and may generate vouchers. Since these functions were previously done manually, a reduction in employee workload will also occur.

The second risk is that the control environment will not be modified to adjust to the new automated control environment. While departmental internal auditors participated in the design of the new automated systems, district level processes are needed to ensure that the controls over the automated systems have been properly implemented and that the controls are functioning as intended.

District engineers determine the internal reviewer's role and function within each district. This creates wide variances in their effectiveness. Although some internal reviewers develop and carry out risk-based audit plans, others spend much of their time on "special" projects or responsibilities. These may include tasks such as

---

[1]Note: District internal auditors are called "internal reviewers."

overseeing lunchroom bookkeeping or serving as executive management's administrative aide.

When an internal audit function is not clearly delineated, "ad hoc" audit functions spring up because managers cannot be assured that adequate controls are in place to ensure the quality of both processes and information. This can be costly as presented in the examples below.

- Since controls over voucher processing are not routinely tested in many districts, division level groups, such as voucher processing and purchasing, "audit" vouchers creating multiple layers of auditing.

- Since compliance with district data entry policy/procedures is not tested, information which could be used to determine and evaluate workload is perceived to be unreliable and not used.

Recommendation:

Figure 10 below outlines a comprehensive internal audit function that should be implemented for ensuring data accuracy/consistency and efficiency. Audits in the "ongoing" category are those which are needed to ensure that controls are in place.

Figure 10

INTERNAL AUDIT (REVIEW) RESPONSIBILITIES		
TYPES OF AUDITS	DEPARTMENT INTERNAL AUDIT	DISTRICT INTERNAL REVIEW

Ongoing	Develop audit plans to determine that controls are in place to ensure:
	- accuracy and consistency of data
	- efficient processing
	  • Implement plans at division level.
	  • Communicate/coordinate plans at the district level.
		Implement plans developed by the Department.

Risk-Ranked	Develop a risk-ranked audit plan based on criteria established at the department/ division level. These criteria would include consideration of state/federal initiatives. - Implement plans at division level. - As necessary, request district participation.	Develop a risk-ranked audit plan based on district level criteria. - Implement plans at district level. - Participate, as requested, in Department's audit plan development and audits.
Other	As necessary	As necessary

The process outlined in Figure 10 requires an interactive planning process with an expansion of district contribution/participation in the department level planning/risk ranking process.

The Departmental internal audit currently undergoes a periodic "peer review." This practice should be extended to district internal audit functions. These reviews typically include an assessment of staff qualifications, development of the audit plan, and the quality of the audit work. We are not suggesting that the Departmental internal audit should conduct these reviews, although staff could certainly participate.

Management's Response:

We agree that clearly delineated responsibilities and an interactive planning process will improve the effectiveness and the efficiency of the internal audit/review function. A team of district and division personnel will be formed to:

- *further define the role of district/division internal review analyst*
- *develop a planning process that includes management, district/division internal review, and internal audit.*

A second team will address extending peer review to the district/division level. The work of both teams is targeted for completion by June 1995.

District Engineers do have significant flexibility in setting the agenda of the internal review analyst. We believe this flexibility is necessary for the maximum effectiveness of the internal review function. District internal review is a tool intended to help the district engineer to achieve his/her goals. The recommended actions will contribute to more effective utilization of this management tool.

Section 5-B:

The Department Does Not Have A Process In Place To Ensure Substandard Contractors Are Not Contracted For Future Projects

The Department is not using contractor's performance assessment as a true evaluation tool. Although contractors are evaluated on a monthly basis, the assessment is not linked to the contract awarding process. Therefore, contractors who receive poor performance ratings can subsequently contract with the Department for future construction projects. The Department paid $1.4 billion to private contractors for the construction of roadways in fiscal year 1993.

In order to ensure that the Department continues to receive the quality of services intended, a mechanism should be in place to prevent substandard contractors from future construction projects. Presently, the contractor's performance assessment is only used to monitor performance on current contracts. The assessment should be used as an evaluation tool in awarding future contracts.

The Project Manager assesses a contractor's performance on a scale of 0-10 in eight different categories. These ratings are averaged, and an overall rating is given. If the overall rating is marginal or poor, the Area Engineer is required to document why the rating was given. However, the Department does not keep track of the contractors that continually receive poor ratings. The assessment is only used to inform the contractor of his status.

In addition, the assessment compares the estimated percent complete to the estimated time elapsed. This allows the Department to assess if a contractor will exceed the allowed working days specified in the contract.

A contractor is allowed a specific amount of days to complete a contract. If a contractor is in excess of the allowed days, a liquidated damages dollar rate is charged for each day. The Department had a total of $2,562,300 in liquidated damages on projects completed from September 1992 until April 1994. The Department does not track reasons for liquidating damages.

During our analysis of liquidated damages charges by the Department, we noted the following:

- Thirty-seven contractors were assessed liquidated damages in more than one district. Of the 37, six contractors have liquidated damages in four or five districts. This resulted in liquidated damages of $1,296,800 and $314,900, respectively.

- Fourteen contractors were assessed liquidated damages in excess of the allowed working days by 50 or more days. Of the 14, two contractors were over 100 days. This resulted in liquidated damages of $721,500 and $128,800, respectively.

Entering into contracts with contractors that have poor performance ratings could result in substandard construction that, over time, could be costly for the State to correct. Projects with contractors in lengthy or recurring liquidated damages may result in additional days. These additional days can cause delays in project completion. This may contribute to traffic delays and inconveniences to the traveling public.

Recommendation:

The Department should use the contractor's performance assessment as an evaluation tool that links to the contracting process. Therefore, the Department would be able to ensure that the quality of services intended will be received. This could be accomplished by the following:

- An overall performance assessment of the contractor. The assessment should be one of the factors for calculating the bidding capacity of the contractor.

- A contractor that is in liquidated damages should not be allowed to bid on other contracts.

Management's Response:

Every project is administered and inspected to assure that the contractor's performance, materials, and end products comply with the plans and specifications. This is the procedure for precluding being given substandard work by contractors. Overrun of contract time is not a measure of standard or substandard work. Establishing the allowed working days is not a precise science since construction work has many variables that are beyond the control of the department or the contractor. Contract time may be and is extended when the department adds work to a contract and for impediments to performing the work that are beyond the control of the contractor.

Auditor's Follow-up Comment:

We agree that TxDOT procedures do allow for the correction of substandard work by a contractor. However, the Department should use the contractor's performance evaluation as a tool to assist in identifying those contractors whose work does not comply with specifications on its first attempt. Re-working portions of a construction project costs both the contractor and the State. By considering the performance of a contractor in the bidding process, the Department may avoid situations where work has to be redone to meet specifications.

Section 6:

The Department Needs To Improve Management of Information Resources Over Two Systems

Management of information resources over two systems can be strengthened. Management of information resources is essential for the safeguarding of assets. An evaluation of information needs, cost, and quality assists the Department in ensuring that processes are efficient and effective and that resources are not wasted.

The Department has not completed the plan for the future operation of the Registration and Title System. Also, the Department has spent a total of $320,000 on the Bid Analysis Management System, although the specific benefits of the system are unknown.

Section 6-A:

The Department Needs To Complete The Plan For Future Operation Of The Registration And Title System

The Department has not completed its plan for the future operation of the Registration and Title System. The system will manage registration revenue, title fees, and sales

taxes for vehicles, which account for over $2 billion a year. Without adequate planning for the continuous operation of the Registration and Title System, the Department cannot ensure that the system will be properly supported.

In the past, the Registration and Title System project encountered several problems and setbacks. For example, the project started in September 1986 with an original completion date of December 1991. The new completion date is now November 1995. The major contributor for the delays was the project's lack of proper project management and technical expertise.

The Department has contracted with a consultant to develop a Project Management Plan for the Registration and Title System. Once the contract is completed in November 1995, the project is scheduled to revert back to the Department. However, based on past history with this system, the Department may lack the required expertise and training for ongoing system operation. The Department must determine what resources will be needed to maintain and support the system and who will provide these resources.

Recommendation:

Finalize the plan for the future operation of the Registration and Title System. The decision as to who will provide the ongoing operation of the system must be determined. If the system will be maintained in-house, the Department needs to determine the resources needed and train its employees to support the system. If the system will be outsourced, the Department needs to determine who will provide the support.

Management's Response:

Between now and full implementation of the Registration and Title System (RTS) in November of 1995, the Assistant Executive Director for Motorist Services will be working with the Deputy Executive Director for Administrative Services and the divisions and offices referenced above, to determine if RTS should be managed in-house or if out-sourcing for a manager (who would coordinate with the divisions) is the best course of action to take. The detailed action plan will be in place by November 1995 when the current consultant contract expires.

Section 6-B:

The Bid Analysis Management System Is Not Being Fully Used By The Department

The Department is only using one of five modules of the Bid Analysis Management System. Annual base and licensing fees have been paid at a total cost of $320,000 since 1986.

Although the Department has licensed all five of the modules, an evaluation has not been done to determine the specific benefits of the system or each module. Therefore, the Department does not know if the system is the most efficient and effective tool for construction programs.

The purpose of the Bid Analysis Management System is to provide the Department with a cost-effective and comprehensive solution for managing transportation programs. This management tool was to assist in program planning through construction administration and monitoring of contract bids. According to Department personnel, the benefit of having the system is the new and innovative processes of the system which are updated on an annual basis.

The system contains five modules to meet the needs of construction contracts: cost estimation, proposal and estimates, letting and award, construction administration, and decision support. Currently, the Department is only using the decision support system. The decision support system assists the Department in identifying statistical variations in bidding practices.

The Department does not have the human or computer resources to install or use the remaining modules. However, the Department continues to pay base and license fees at a cost of $60,000 annually to have input regarding generic reports generated by the Bid Analysis Management System. For fiscal year 1995, the annual fee will increase to $95,000.

Recommendation:

Evaluate the Bid Analysis Management System to determine if it is the most efficient and effective tool for the construction program. If the system is not, the Department should not pay the base and licensing fees for the Bid Analysis Management System for fiscal year 1996. This would be a cost savings of $95,000. If the system is efficient and effective, the Department should commit the necessary resources to implement all of the modules.

Management's Response:

This system is an American Association of State Highway and Transportation Officials (AASHTO) joint development effort. The annual base and licensing fees assist in funding this coordinated development effort. An initial evaluation of the information systems support of the construction area was completed in April, 1993. In addition, a high level evaluation has been completed as part of the Retooling TxDOT: Business Information and Systems Plan.

As outlined in our Retooling TxDOT efforts, the detailed analysis referred to by the auditors is scheduled to occur after the evaluation of the business processes in the "Construct Transportation Systems" business area. Any decisions prior to that time would be premature and would place the Department at risk in terms of changing a

system to match current processes and then having to change again to accommodate the needs of the "retooled" processes.

Section 7:

The Texas Transportation Plan Development Process Appears Adequate; However, The Monitoring Process Should Be Improved

Although the Department is making adequate progress in developing the Texas Transportation Plan, the monitoring process should be improved. The Texas Transportation Plan will serve as both the federally required Intermodal Surface Transportation Efficiency Act Long Range Plan and the state-required Statewide Transportation Plan.

The Department has contracted with a consultant to develop the Texas Transportation Plan. Both the Department and the consultant are monitoring the project's status and report that the project is on schedule.

However, the procedures for monitoring the quality of the technical components are minimal. The Department does not have formal procedures to ensure the quality and accuracy of the data within the plan. Also, one element of the project status does not include completion dates and changes in deadlines.

Procedures should be performed to ensure that optimal quality is received to meet state and federal requirements. Quality is necessary to provide the Department with a document that they can build upon for future plans. In addition, if federal requirements are not met, the United States Department of Transportation can withhold future funds until the appropriate corrective action has been taken. Completion dates and changes in deadlines would allow the Department to more accurately assess the status of the project.

Recommendation:

Establish additional procedures for monitoring the quality of technical components, and incorporate completion dates and changes in deadlines when reporting project status of the Texas Transportation Plan.

Management's Response:

We concur with the basic finding. The consultant has in place an internal quality control procedure used to verify data viability. They are documenting sources of data and information and will provide this documentation to TxDOT.

TxDOT will establish more formal procedures to verify data quality and viability. We expect this to be a combination of in-house source review based on section personnel knowledge, use of sources external to the section for verification and possible spot

checking of data. This will begin as soon as practical and before accepting the consultant's report.

TxDOT will also expand its existing, basic, schedule/deadline tracking methodology to better assess consultant progress and assess project status.

It should be noted that the consultant is a well respected and experienced firm which brings established credibility to the quality of its work. It should also be noted that this entire process is new to the Department and is a learning experience to be used to modify and improve future statewide plan procedures.

Section 8:

Overall, Adequate Progress Has Been Made On The 1989 Strategic Mobility Plan Recommendations

Overall, the Department has made significant progress in implementing the recommendations contained in the State Auditor's Office review of the 1989 Strategic Mobility Plan (SAO Report No. 2-017). However, the Department needs to improve review procedures, particularly over the mathematical accuracy and completeness of the data supporting estimates of funding requirements and sources.

The Strategic Mobility Plan is no longer used by the Department. Some of the information has been incorporated into the Department's strategic plan. The strategic plan will align with the Texas Transportation Plan.

Since the information in the plan will be relied upon for other planning documentation and may be used in decision making, the calculations and supporting documentation should be complete and accurate.

Recommendation:

Improve review procedures over the mathematical accuracy and completeness of the data supporting estimates of funding requirements and sources.

Management's Response:

We concur with the recommendation. We will now verify source data with originating district, division or special office and validate source data to the extent possible.

This page is intentionally blank.

Appendix 1:

Objective, Scope, And Methodology

Objective

Our audit objective was to evaluate the existing management control systems within the Department of Transportation and to identify opportunities for improvement.

The evaluation focused on answering the following questions:

- Is the Department productively managing the construction and maintenance process?
- Is the Department administering support services efficiently?
- Does the Department adequately monitor its contracting process?
- Do opportunities exist for greater productivity in non-transportation functions?
- Is the Department planning for future initiatives appropriately?

Scope

The scope of this audit included the consideration of construction, maintenance, and administrative operations; management of information resources; construction contract monitoring; role of internal audit; and planning processes.

The consideration of the Department's construction operations included a review of:

- the process of a project from inception to construction
- information, data, and reports that are used to monitor construction operations
- monitoring methods, procedures, and systems and the use of this information in the decision-making process

The consideration of the Department's maintenance operations included a review of:

- information and data contained in the Maintenance Management Information System
- reports related to equipment usage
- reports used to monitor the amount of maintenance contracting
- the process of budgeting maintenance funds to districts
- review of reports used to monitor maintenance

The consideration of the Department's administrative operations included a review of:

- the procedures and resources to process administrative functions, including voucher processing, accounting, warehousing, purchasing, and human resources
- organizational structure and responsibilities for administrative functions
- existence of policies and processes to evaluate the performance of administrative functions

The consideration of the Department's management of information resources included a review of:

- the process to identify resources needed to achieve the Department's goals for the Registration and Titling System
- feasibility studies and use of reports from the Bid Analysis Management System

The consideration of the Department's construction contract monitoring included a review of:

- the use of monitoring information in the contracting process
- the policies and procedures for monitoring contract performance on construction projects
- compliance with policies and procedures

The consideration of the Department's role of internal audit included a review of:

- reporting relationships between Department and district internal auditors
- roles and responsibilities of internal auditors
- impact of automated changes on control environment

The consideration of the Department's planning processes included a review of:

- the alignment of the Texas Transportation Plan with the Department's strategic plan
- the development of the Texas Transportation Plan
- follow-up on prior recommendations on the Strategic Mobility Plan

Methodology

The methodology used on this audit consisted of collecting information, performing audit tests and procedures, analyzing the information, and evaluating the information against established criteria.

Information collected to accomplish our objectives included the following:

- Interviews with management and staff at the Texas Department of Transportation headquarters and district offices
- Site visits to the following districts -- Atlanta, Austin, Corpus Christi, Houston, Lubbock, Odessa, Pharr, San Angelo, and Waco
- Interviews with individuals from the Federal Highway Administration and other states
- A statewide questionnaire on administrative functions of all districts
- Documentary evidence such as:
  - State and federal statutes and regulations
  - Department of Transportation publications, documents, memoranda, contracts, and audit reports

  - Various management reports
- Enabling legislation
- Agency-generated data from the Financial Information Management System, Maintenance Management Information System, Design and Construction Information System, Human Resource Management System, Contract Information System

Procedures and tests conducted:

- Review of contract monitoring controls
- Examination of construction and maintenance project management techniques
- Assessment of Department planning processes
- Potential cost-savings analysis of the construction, maintenance, and administrative functions (see Appendix 1.1)

Analytical techniques:

- Comparative analysis of construction, maintenance, and administrative operations in districts
- Process review
- Trend analysis

Criteria used:

- State Auditor's Office Accountability Project Methodology general and specific criteria
- State Auditor's Office Management Control Methodology
- Peer group standards and comparisons
- Other standards and criteria developed through research (see Reference List - Appendix 4)

Other Information

Fieldwork was conducted from April 1994 to August 1994. We did not verify or review the accuracy of the data provided by the Department of Transportation. Other than this exception, the audit was performed in accordance with applicable professional standards, including:

- Generally Accepted Government Auditing Standards
- Generally Accepted Auditing Standards

The audit work was performed by the following members of the State Auditor's staff:

- Jeanmarie C. Henderson, CPA (Project Manager)
- Judith A. Anderson, CISA
- Scott Bertrand
- Robin R. Key, CPA
- Robert Launius
- Joanna B. Peavy, CPA
- Lynn Gray Redwine, CPA
- Pamela Spencer
- Janet Tarbell, CPA
- Dorothy J. Turner, CPA
- Frianita R. Wilson
- Leo J. Paterra, CPA (Audit Manager)
- Deborah L. Kerr, Ph.D. (Director)

Appendix 1.1:

Potential Cost-Savings Methodologies

The methodology used to calculate potential cost savings consisted of collecting information and financial data, establishing criteria, performing audit tests and procedures, analyzing the information and financial data, and evaluating the information and financial data against the established criteria.

The savings presented are considered potential savings since our methodology identified practices which indicate below average performance, but did not identify the specific changes which should be made. The actual cost savings realized by each district could be less or could even be greater. We compared each district with the average performance in its peer group, not the highest or lowest performance in the peer group.

The sources of information and methodologies for each functional area analyzed are presented below.

Construction

Sources of information included:

- Budget Monitoring Department Report for fiscal year 1993
- Employee Level Report - Full Time Equivalents, fiscal year 1993
- District and County Statistics (DISCOS), October 1993

Procedures, tests, analysis, and criteria used:

- Obtaining available performance data.
- Grouping districts into standard Department peer groups, including Metropolitan, Urban, and Rural.
- Determining five-year average of construction expenditures for each district.
- Identifying two criteria to measure district performance. The criteria identified were:
  - construction cost per full-time equivalent preliminary and construction engineering employee
  - preliminary and construction engineering expenditures to construction contract expenditures
- Developing peer standards by calculating a weighted average for each peer group.
- Comparing districts within each group to the peer standard.
- Calculating savings within each peer group by bringing those districts identified as not meeting both standards to the weighted average.

Maintenance

Sources of information included:

- Maintenance Management Information System data

Procedures, tests, analysis, and criteria used:

- Selecting the seven maintenance classification codes for analysis based on nature of the expenditures or the dollar amount of expenditures incurred by state employees.
- Obtaining available performance data.
- Grouping districts into standard Department peer groups, including Metropolitan, Urban, and Rural.
- Calculating total cost for each maintenance classification code in each district for work performed by state employees. Total cost included labor, materials, equipment, and miscellaneous. Total cost excludes overhead and contractor payments.
- Identifying criteria to measure district performance. The criteria identified was total cost per unit for each maintenance classification code.
- Developing peer standards by calculating a median for each peer group.
- Comparing districts within each group to the peer standard.
- Calculating savings within each peer group by bringing those districts identified as not meeting the standard to the median.

Administrative

Sources of information included:

- District surveys
- Employee Level Report - Full Time Equivalents, fiscal year 1993
- Fiscal Year 1993 Voucher Totals by District/Division
- Disadvantaged Business Enterprises and Small Business Monitoring Analysis for Fiscal Month/Year, Year-to-Date 1993 by District/Division
- Materials and Supply Management System Performance Records
- Fiscal Year 1993 FTE Allocation Status (without paid overtime)

Procedures, tests, analysis, and criteria used for voucher processing:

- Obtaining available performance data.
- Determining percent of time employees in voucher processing spend processing vouchers and adjusting staff numbers to reflect that percentage.
- Grouping districts into standard Department peer groups, including Metropolitan, Urban, and Rural.
- Identifying two criteria to measure district performance. The criteria identified were:
  - number of vouchers processed per employee
  - voucher dollars processed per employee

- Calculating a cost per voucher processed for each district, using an "assumed" salary.
- Developing peer standards by calculating a weighted average for each peer group.
- Comparing districts within each group to the peer standard.
- Calculating savings within each peer group by bringing those districts identified as not meeting both standards to an average cost of $70, $80, $90, and $100 for processing a voucher.

Procedures, tests, analysis, and criteria used for other administrative:

- Obtaining available performance data.
- Determining percent of time employees in warehousing, purchasing, and human resources spend in each area and adjusting staff numbers to reflect that percentage.
- Grouping districts into standard Department peer groups, including Metropolitan, Urban, and Rural.
- Identifying one criteria within each administrative function to measure district performance. The criteria identified were:
  - Human Resources - district FTEs per human resource employee
  - Warehouse - transactions per warehouse employee
  - Purchasing - purchase orders per purchasing employee
  - Accounting - district FTEs per accounting employee
- Developing peer standards by calculating a weighted average for each peer group.
- Comparing districts within each group to the peer standard.
- Calculating savings within each peer group by bringing those districts identified as not meeting the standard to the weighted average.

This page is intentionally blank.

Appendix 2:

Department Profile

Mission and Vision

The Department's mission is "to work cooperatively to provide safe, effective, and efficient movement of people and goods."

The Department's stated vision is "to be a progressive state transportation agency recognized and respected by the citizens of Texas:

- Providing comfortable, safe, durable, affordable, and environmentally sensitive transportation systems that work together;
- Ensuring a desirable workplace which creates a diverse team of all kinds of people and professions;
- Using efficient and cost-effective work methods that encourage innovation and creativity; and
- Promoting a high quality of life through partnerships with the citizens of Texas and all branches of government by being receptive, responsible and cooperative."

Background

- 1917 - Texas Legislature created the Texas Highway Department and charged it with granting financial aid to counties for highway construction and maintenance.
- 1975 - Legislature expanded the Department's responsibilities by combining the Texas Mass Transportation Commission and the Texas Highway Department to form the State Department of Highways and Public Transportation.
- 1976 - Governor's Office of Traffic Safety was transferred to the Department by executive order.
- 1979 - All statewide traffic safety programs were combined into one traffic safety unit in the Department by executive order.
- 1991 - Legislature formed the Texas Department of Transportation by merging the State Department of Highways and Public Transportation, the Department of Aviation, and the Texas Motor Vehicle Commission.

Operations

The Department has a work force of approximately 14,000 and is governed by the three-member Texas Transportation Commission appointed by the governor and an executive director selected by the commission.

A major reorganization of the Department occurred October 1, 1993, since 1,370 employees retired due to the retirement incentive program passed by the 73rd Texas Legislature. In the new organization, the executive director is the chief officer, assisted by 2 deputy executive directors, 4 assistant executive directors, and 1 director. The primary function of the Department is to plan, design, construct, and maintain transportation systems.

The Department is organized into 7 functional areas:

- Transportation Planning and Development
- Field Operations
- Multimodal Transportation
- Administrative Services
- Human Resources Management
- Motorist Services
- Staff Services

An internal audit office performs audits of department operations.

The Department conducts its primary activities in 25 geographically located districts throughout Texas to address the needs of the local customers. Each district is managed by a district engineer who oversees the primary work of the Department in the district. Each district is responsible for the plan, design, location, construction, and maintenance of transportation systems in its area. The 7 functional areas at the Department contains 18 divisions and 10 special offices. The divisions provide administrative and technical support for the 25 districts.

For fiscal year 1993, the Department had revenues of $1.7 billion and other financing sources of $1.3 billion. Of the $3 billion, $2 billion, which represents 67 percent, was expended on highway construction and maintenance.

Innovation

- The Department is looking for more efficient and effective ways of doing business through a project called *Retooling TxDOT*.
- The Department has a Continuous Improvement Office which is its approach to total quality management. The continuous improvement efforts recognize external and internal customers' needs and promote continuous teamwork to improve products and services.
- The Department has a "Scrubbing the Budget" initiative referred to as the *Budget Efficiency Effort*. The team is identifying cost savings, starting with equipment.

Figure 11

Texas Department of Transportation

Organization Structure

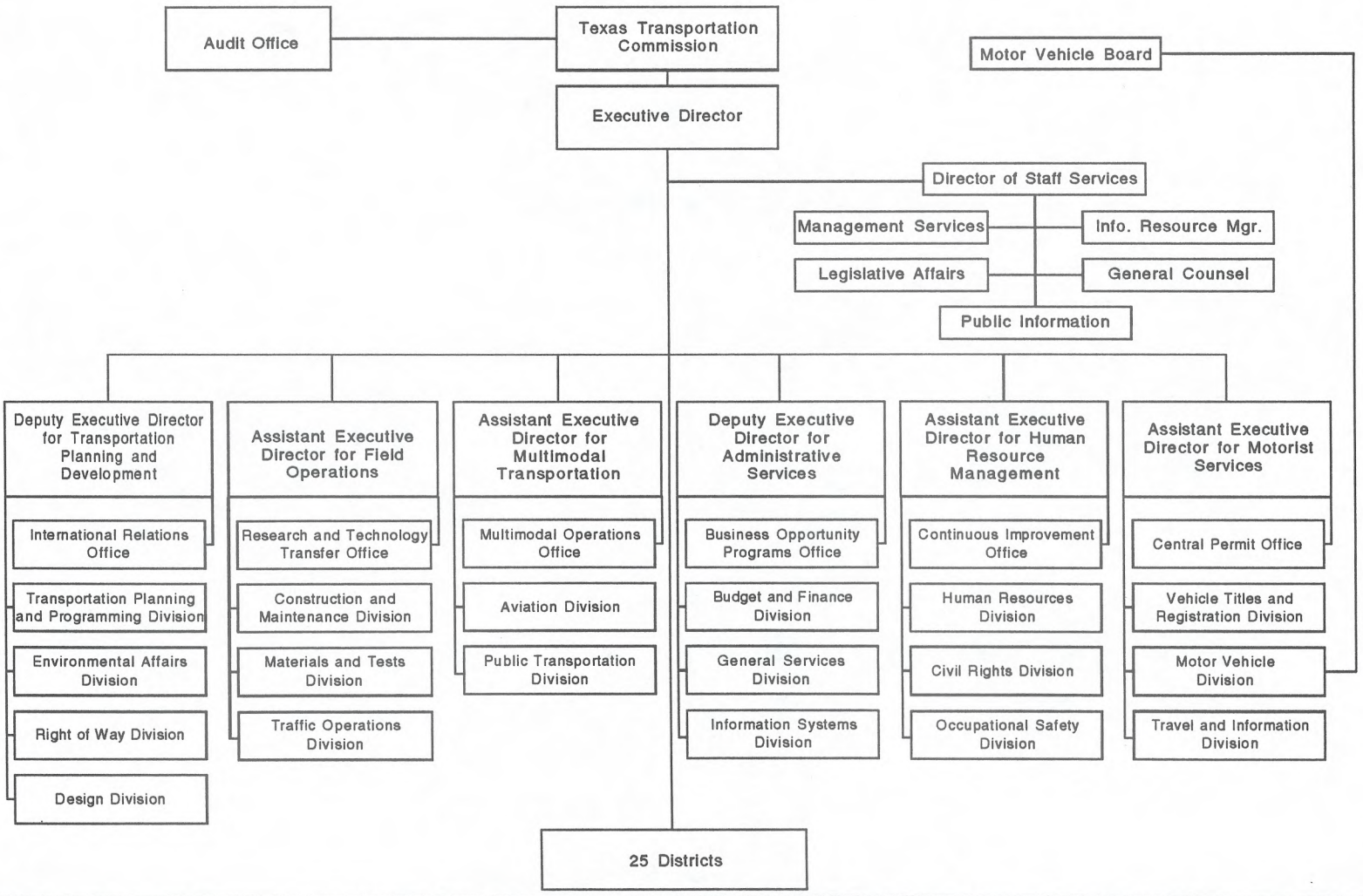


Figure 12

Standard District Structure
District Engineer
Deputy District Engineer
Internal Review
Legal
Public Affairs
Director of Administration
Director of Transportation Planning and Development
Area Engineers
Director of Construction
Director of Maintenance
Director of Transportation Operations
Metropolitan Districts
Austin
Dallas
Fort Worth
Houston
San Antonio
Urban Districts
Beaumont
Corpus Christi
El Paso
Lubbock
Pharr
Tyler
Waco
Rural Districts
Abilene
Amarillo
Atlanta
Brownwood
Bryan
Childress
Laredo
Lufkin
Odessa
Paris
San Angelo
Wichita Falls
Yoakum

Figure 13

Comparison of Appropriated Funds, Budgeted Funds, and Expenditures for FY 1994
Texas Department of Transportation

Goals/Objectives	Total Appropriations	Revised Operating Budget as of 8/31/94	Year-to-Date Cash Expenditures as of 8/31/94 (A)
A. **OPERATIONS AND MAINTENANCE**			
1) Operate and maintain highway system at the highest level of service	$708,856,410	$666,623,297	$545,190,199
2) Achieve reduction in highway accident rates and severity	16,164,523	15,829,540	12,714,091
3) Support maintenance of Gulf Intracoastal Waterway	1,901,041	1,853,163	194,155
4) To increase public use of travel and information services	18,215,491	15,977,002	11,090,650
5) Provide customer oriented regulatory/transportation-related services	48,385,193	39,974,364	32,146,721
TOTAL FOR OPERATIONS AND MAINTENANCE	$793,522,658	$740,257,366	$601,335,816
B. **TRANSPORTATION PROJECTS**			
1) Preserve the state highway system with transportation projects	$2,239,119,006	$2,143,718,143	$1,696,648,411
2) Assume leadership in transportation infrastructure planning decisions	37,816,398	33,573,268	27,114,334
3) Promote aviation safety, economic development, and air transportation	23,409,256	26,199,677	13,960,354
4) Foster and assist the development of public transportation in Texas	54,486,740	62,919,760	34,223,587
TOTAL FOR TRANSPORTATION PROJECTS	$2,354,831,400	$2,266,410,848	$1,771,946,686
C. Section 146, 1993 salary increase	$13,418,851	$231,830	$0
GRAND TOTAL	$3,161,772,909	$3,006,900,044	$2,373,282,502

(A) Does not include accrued expenses incurred after August 31, 1994.

Source: General Appropriations Act, 1994-1995 Biennium, Uniform Statewide Accounting System and Texas Department of Transportation

Figure 14

Year-To-Date Expenditures for FY 1994
Texas Department of Transportation - as of August 31, 1994

Year-To-Date Expenditures as of 8/31/94	Operations and Maintenance	Transportation Projects	Total
DIRECT COSTS:	$560,118,023	$1,701,065,174	$2,261,183,197
INDIRECT COSTS:			
Agency Administrative Costs			
Central Administration	$3,944,313	$6,782,966	$10,727,279
Financial/Personnel	9,309,368	16,009,155	25,318,523
Information Resources Technologies	6,694,075	11,511,683	18,205,758
Operation/Support	21,270,037	36,577,708	57,847,745
Total Agency Administration Costs	$41,217,793	$70,881,512	$112,099,305
YEAR-TO-DATE EXPENDITURES, 8/31/94 *	$601,335,816	$1,771,946,686	$2,373,282,502

Source: General Appropriations Act, 1994-1995 Biennium, Uniform Statewide Accounting System and Texas Department of Transportation

* These figures do not reflect all of fiscal year 1994 expenditures. During September 1994, $260 million was expended. The expenditure amount will get charged back to 1994 appropriated amounts.

Appendix 3:

Detailed Information on Potential Cost Savings

Figure 15

	DISTRICT	$ per FTE (A)	% P/C Engineering to Construction $ (B)	Potential Savings (C)
METRO	Austin	$400,909	11.37%	
	Dallas	$347,911	10.53%	$538,000
	Ft. Worth	$340,003	9.50%	
	Houston	$414,176	10.17%	
	San Antonio	$325,482	9.77%	
	Weighted Average	$374,337	10.26%	
URBAN	Beaumont	$357,681	10.07%	
	Corpus Christi	$324,579	9.72%	
	El Paso	$263,509	13.10%	$847,000
	Lubbock	$265,025	12.75%	$581,000
	Pharr	$618,956	5.84%	
	Tyler	$231,327	15.30%	$1,452,000
	Waco	$197,828	14.85%	$1,014,000
	Weighted Average	$321,530	10.53%	
RURAL	Abilene	$282,244	11.58%	
	Amarillo	$211,492	15.67%	$361,000
	Atlanta	$222,293	16.09%	$622,000
	Brownwood	$230,433	12.48%	
	Bryan	$218,534	15.26%	$356,000
	Childress	$331,213	9.28%	
	Lufkin	$254,617	13.94%	
	Odessa	$190,559	16.81%	$458,000
	Paris	$285,151	12.79%	
	San Angelo	$259,361	13.07%	
	Wichita Falls	$243,104	13.10%	
	Yoakum	$291,933	11.70%	
	Weighted Average	$249,599	13.47%	
	TOTAL			**$6,229,000**

Sources: Texas Department of Transportation Budget and FTE Reports.

COST OF PRELIMINARY AND CONSTRUCTION ENGINEERING

(A) $ per FTE: Construction dollars divided by full-time equivalent employees in preliminary and construction engineering.

(B) % P/C Engineering to Construction $: Preliminary and construction engineering dollars as a percentage of construction dollars.

(C) Districts with potential savings include those whose were:
- below the peer group weighted average dollars per FTE.
- above the peer group weighted average percent preliminary and construction engineering to construction dollars.

Figure 16

	DISTRICT	110	120	212	241
METRO	Austin	12.35	7.26	1.96	5.38
	Dallas	6.81	5.05	2.18	7.14
	Ft. Worth	8.02	1.50	1.55	4.46
	Houston	6.01	27.09	3.88	9.02
	San Antonio	8.39	2.09	1.60	6.72
	Median Cost per Unit	8.02	5.05	1.60	6.72
URBAN	Beaumont	5.20	3.30	0.86	4.32
	Corpus Christi	3.84	3.09	1.56	7.93
	El Paso	2.01	1.07	2.82	10.37
	Lubbock	2.99	0.56	1.30	9.05
	Pharr	7.89	24.57	2.02	5.41
	Tyler	11.93	3.78	2.00	9.17
	Waco	5.17	2.63	1.78	8.18
	Median Cost per Unit	5.17	3.09	1.78	8.18
RURAL	Abilene	4.78	1.29	1.94	9.45
	Amarillo	9.66	4.13	2.29	14.56
	Atlanta	6.72	1.78	1.92	5.09
	Brownwood	8.22	1.06	1.66	5.32
	Bryan	3.23	0.71	1.91	3.70
	Childress	3.92	2.60	1.19	8.12
	Lufkin	2.65	1.16	2.36	2.66
	Odessa	0.61	0.61	1.87	7.88
	Paris	6.20	2.47	1.94	4.41
	San Angelo	8.75	N/A	1.50	26.46
	Wichita Falls	4.86	0.57	1.48	6.83
	Yoakum	7.26	1.71	1.74	5.34
	Median Cost per Unit	5.53	1.29	1.89	6.09

Source: 1993 Maintenance Management Information System Data

	DISTRICT	242	511	711
METRO	Austin	7.39	85.65	0.03
	Dallas	13.03	13.80	0.03
	Ft. Worth	6.86	59.80	0.04
	Houston	9.53	64.37	0.05
	San Antonio	5.14	47.24	0.03
	Median Cost per Unit	7.39	59.80	0.03
URBAN	Beaumont	5.41	139.13	0.03
	Corpus Christi	9.34	34.26	0.03
	El Paso	16.74	33.73	0.04
	Lubbock	12.48	2.99	0.03
	Pharr	7.35	28.28	0.02
	Tyler	2.41	106.10	0.03
	Waco	13.78	18.42	0.03
	Median Cost per Unit	9.34	33.73	0.03
RURAL	Abilene	9.71	31.97	0.02
	Amarillo	19.58	31.20	0.04
	Atlanta	20.62	95.26	0.03
	Brownwood	3.95	1.40	0.02
	Bryan	17.45	63.94	0.02
	Childress	7.16	14.21	0.03
	Lufkin	2.70	36.04	0.04
	Odessa	6.11	26.49	0.02
	Paris	3.68	104.76	0.02
	San Angelo	21.63	15.79	0.03
	Wichita Falls	9.63	24.47	0.03
	Yoakum	6.49	40.44	0.03
	Median Cost per Unit	8.40	31.59	0.03

COST OF SELECTED MAINTENANCE FUNCTIONS

The costs presented are for state employees performing the function. Costs are for each unit of work performed by each district in fiscal year 1993 and include labor, materials, equipment, and miscellaneous expenditures. Cost excludes overhead and contractor payments.

Description of Function and Unit Used:

110 Base Removal and Replacement/square yard
120 In Place Repair/square yard
212 Leveling or Overlay with a Maintainer, Drag Box, or Similar Equipment/square yard
241 Potholes, Semi-permanent Repair/number of potholes
242 Potholes, Permanent Repair/number of potholes
511 Mowing/acre
711 Paint and Bead Striping/linear foot (one foot of four inch wide stripe)

Source: 1993 Maintenance Management Information System Data

Figure 17

	DISTRICT	VOUCHER PROCESSING Number of vouchers processed per employee	VOUCHER PROCESSING Voucher dollars processed per employee
METRO	Austin	219	2,199,852
	Dallas	456	6,086,242
	Ft. Worth	409	4,769,823
	Houston	478	7,592,772
	San Antonio	367	2,993,858
	Weighted Average	378	4,638,465
URBAN	Beaumont	231	1,619,946
	Corpus Christi	373	2,483,559
	El Paso	264	1,184,141
	Lubbock	555	3,642,130
	Pharr	351	2,538,928
	Tyler	506	4,564,663
	Waco	627	4,433,684
	Weighted Average	369	2,550,683
RURAL	Abilene	273	1,981,557
	Amarillo	390	3,333,465
	Atlanta	317	1,705,954
	Brownwood	319	2,173,891
	Bryan	206	2,405,166
	Childress	326	1,452,066
	Lufkin	365	3,304,020
	Odessa	430	1,812,886
	Paris	385	2,561,456
	San Angelo	206	1,338,529
	Wichita Falls	427	2,743,867
	Yoakum	506	3,168,837
	Weighted Average	335	2,281,350
	Source: TxDOT district survey and division reports		

	DISTRICT	VOUCHER PROCESSING Cost per voucher processed	VOUCHER PROCESSING EFFICIENCY BY DISTRICT (FY 1993)
METRO	Austin	$136	Inefficient districts processed both fewer vouchers per employee and fewer voucher dollars per employee in terms of their peer group weighted average. Cost per voucher processed assumed a monthly salary of $1,700 plus benefits.
	Dallas	$65	
	Ft. Worth	$73	
	Houston	$62	
	San Antonio	$81	
	Weighted Average	$79	
URBAN	Beaumont	$129	
	Corpus Christi	$80	
	El Paso	$113	
	Lubbock	$54	
	Pharr	$85	
	Tyler	$59	
	Waco	$48	
	Weighted Average	$81	
RURAL	Abilene	$109	
	Amarillo	$76	
	Atlanta	$94	
	Brownwood	$93	
	Bryan	$144	
	Childress	$91	
	Lufkin	$82	
	Odessa	$69	
	Paris	$77	
	San Angelo	$145	
	Wichita Falls	$70	
	Yoakum	$59	
	Weighted Average	$89	
	Sources: TxDOT district survey and division reports		

Figure 18

	DISTRICT (A)	ACCOUNTING District FTEs per accounting employee	WAREHOUSE Transactions per employee	PURCHASING Purchases per employee
METRO	Austin	218	3309	1415
	Dallas	122	2047	655
	Ft. Worth	110	4385	2128
	Houston	110	2441	1383
	San Antonio	178	3849	1339
	Weighted Average	130	2879	1222
URBAN	Beaumont	811	4473	1132
	Corpus Christi	80	2983	1343
	El Paso	339	4962	1832
	Lubbock	155	6149	1986
	Pharr	171	1982	1290
	Tyler	92	1763	1361
	Waco	87	4873	2714
	Weighted Average	133	3242	1569
RURAL	Abilene	115	5048	879
	Amarillo	137	2120	1573
	Atlanta	338	3813	2017
	Brownwood	77	4833	881
	Bryan	145	3844	3589
	Childress	227	4128	2558
	Lufkin	140	9309	1994
	Odessa	175	11105	2801
	Paris	185	5442	1154
	San Angelo	177	3572	2296
	Wichita Falls	98	6600	2070
	Yoakum	102	5591	1346
	Weighted Average	138	4759	1725

Sources: TxDOT district survey and division reports

	DISTRICT (A)	HUMAN RESOURCES District FTEs per human resource employee	**ADMINISTRATIVE EFFICIENCIES BY DISTRICT (FY 1993)**
METRO	Austin	112	(A) Since the responsibility assignments by administrative function are not always uniform, information for each district should be considered collectively.
	Dallas	183	
	Ft. Worth	164	
	Houston	351	
	San Antonio	307	
	Weighted Average	211	
URBAN	Beaumont	135	
	Corpus Christi	446	
	El Paso	124	
	Lubbock	120	
	Pharr	137	
	Tyler	63	
	Waco	216	
	Weighted Average	130	
RURAL	Abilene	184	
	Amarillo	103	
	Atlanta	124	
	Brownwood	131	
	Bryan	181	
	Childress	227	
	Lufkin	168	
	Odessa	129	
	Paris	74	
	San Angelo	90	
	Wichita Falls	81	
	Yoakum	102	
	Weighted Average	116	
Sources: TxDOT district survey and division reports			

Appendix 4:

Reference List

American Association of State Highway and Transportation Officials. *Information System for Managing Transportation Programs.*

Argenti, Paul A. *The Portable MBA Desk Reference*. 1994.

Diaz, Steven A., Nan Harllee, Gary Maring, and John Rogers. "U.S. Department of Transportation Modal Administration Panel," *ISTEA and Intermodal Planning, Concept, Practice, Vision, Special Report 240*. 1993.

Dye Management Group, Inc. *Regional Issues for the Texas Transportation Plan.* 1994.

Fuller, John W. "The Road to Intermodalism," *ISTEA and Intermodal Planning, Concept, Practice, Vision, Special Report 240*. 1993.

International Business Machines Corporation, and Allied Consultants Incorporated. *Proposal to Provide Project Management Services for the Registration and Title System Project*. 1994.

Kergner, Harold, and Van Nostrand Reinhold. *Project Management.*

Martinez, Robert. "Perspective from the Office of Intermodalism," *ISTEA and Intermodal Planning, Concept, Practice, Vision, Special Report 240*. 1993.

State of Texas. Legislative Budget Board. *Staff Performance Report to the 73rd Legislature*. 1993.

_____. State Auditor's Office. *Interim Briefing Report on the Review of the Strategic Mobility Plan of the State Department of Highways and Public Transportation*. 1990.

_____. State Auditor's Office. *Review of the Maintenance Management Controls*. 1989.

_____. Texas Department of Transportation, Budget and Finance Division. *District and County Statistics*. 1993.

_____. Texas Department of Transportation, *1994-1995 Legislative Appropriations Request.*

_____. Texas Department of Transportation, *1995-1999 Strategic Plan.*

_____. Texas Department of Transportation, *Project Development Plan*. 1994.

_____. Texas Department of Transportation, *Standard Specifications for Construction of Highways, Streets and Bridges*. 1993.

_____. Texas State Department of Highways and Public Transportation. *Bid Analysis Monitoring System Letting and Award System and Contract Administration System Evaluation Report*. 1988.

_____. Texas State Department of Highways and Public Transportation, *Construction Manual*. 1991.

_____. Texas State Department of Highways and Public Transportation, *Self-Evaluation Report to the Sunset Advisory Commission*. 1989.

Copies of this report have been distributed to the following:

Legislative Audit Committee

Honorable James E. "Pete" Laney, Speaker of the House, Chair
Honorable Bob Bullock, Lieutenant Governor, Vice Chair
Senator John Montford, Chair, Senate Finance Committee
Senator Kenneth Armbrister, Chair, Senate State Affairs Committee
Representative Robert Junell, Chair, House Appropriations Committee
Representative Tom Craddick, Chair, House Ways and Means Committee

Governor of Texas

Honorable Ann W. Richards

Legislative Budget Board

Sunset Advisory Commission

Texas Transportation Commission

David Bernsen, Chairman
Ruben R. Cardenas, Member
Anne S. Wynne, Member

Texas Department of Transportation

Wm. G. Burnett, P.E., Executive Director

The State Auditor's Office is an equal opportunity employer and does not discriminate on the basis of race, color, religion, sex, national origin, age, or disability in employment or in the provision of services, programs, or activities.

In compliance with the Americans with Disabilities Act, this document may be requested in alternate formats by contacting Production Services at (512) 479-4700 (Voice), (512) 479-4884 (FAX), or 1-800-RELAY-TX (TDD), or by visiting Two Commodore Plaza, 206 E. Ninth Street, Room 19.100, Austin, Texas 78701. This document is not copyrighted. Readers may make additional copies of this report as needed.