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

November 1998

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Key Points of Report

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

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Overall Conclusion

The Texas Department of Transportation's (Department) materials and supplies inventory records do not accurately represent the quantity and the dollar value of items in its inventory. This inaccuracy is attributed to a lack of accountability for inventory management. While the Department has well-defined policies and procedures, they are inconsistently applied and enforced among districts and individual maintenance sections. However, the Department does provide adequate physical security to minimize the risk of theft and abuse, and it effectively manages its equipment inventory.

Consolidation of district warehouses and reduction of inventory levels create an opportunity for a one-time savings of \$18.2 million over the next biennium with subsequent annual savings of \$5.3 million. The consolidation would also increase the efficiency of inventory management through various service improvements.

Key Facts and Findings

- Over 27 percent of the Department's inventory records do not accurately represent the quantity and dollar value of items in its warehouses. This represents approximately \$5.9 million of inventory that is misplaced, misclassified, or overstocked.
- The Department is not effective in holding district management accountable for the accuracy of its inventory. This lack of accountability is evidenced by inconsistent performance of annual physical inventories, unreliable reporting of road sign inventory, and inconsistent use of performance measurement data. Achieving established performance goals for surplus inventory would save approximately \$5.4 million.
- The Department has opportunities for cost savings and service improvements by consolidating warehouses (\$5.3 million in annual savings) and reducing inventory levels (\$7.6 million in a one-time savings).
- The Department has comprehensive policies and procedures and uses them (along with the equipment information system) to ensure that equipment is adequately managed, maintained, and protected from waste and abuse.

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This audit was conducted in accordance with Government Code, Sections 321.0133 and 321.0134.

Executive Summary

The Texas Department of Transportation's (Department) materials and supplies inventory does not accurately represent the quantity and the dollar value of items in its inventory. Over 27 percent of the Department's inventory records contain errors resulting in approximately \$5.9 million of inventory that is either misplaced, misclassified, or overstocked.

The high inventory error rate is attributed to a lack of accountability for inventory management. This lack of emphasis in effective inventory management is evidenced by inconsistent performance of annual physical inventories, inconsistent and unreliable reporting of road sign inventory, and inconsistent use of performance measurement data. Achieving established performance goals for surplus inventory alone would save the Department approximately \$5.4 million.

Inventory inaccuracy leads to an increased risk that supply levels will be mismanaged. If inventory records indicate the availability of materials and supplies when, in actuality, they do not exist or cannot be located, the risk of delays in maintaining the State's highway systems is increased. There also is a risk that the State's money will not be spent wisely because the Department may not accurately anticipate inventory needs and use the most cost-effective method of purchase, or it may overstock an inventory item.

The Department has the opportunity to achieve an annual cost savings of \$5.3 million through the consolidation of district warehouses. Additionally, consolidation would reduce the Department's total inventory by \$7.6 million. This results in a total cost savings of \$18.2 million over the next

biennium. This consolidation would also increase the efficiency of inventory management through various service improvements.

Despite the inaccuracies of records and management problems relating to materials and supplies inventory, the Department does provide adequate physical security to minimize the risk of theft and abuse.

In addition, the Department has comprehensive policies and procedures and uses them accurately (along with the existing equipment information system) to ensure that equipment is adequately managed, maintained, and protected from waste and abuse.

Summary of Management's Responses

Department management generally agrees with this report's findings and recommendations. Specific responses are included at the end of each section of this report.

Summary of Objectives, Scope, and Methodology

Our objectives were to determine if management controls for selected segments of the Department's inventories and fixed assets were adequate and if related performance goals were routinely and accurately measured.

The scope of the audit included materials and supplies inventory and equipment at 9 of the 25 districts and 1 of the 4 regional supply centers. We visited 124 maintenance sections. We reviewed the inventory records for the fiscal year ending August 31, 1998.

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Inventory Records for Materials and Supplies Are Inaccurate and Inventory Management Lacks Accountability

The Texas Department of Transportation's (Department) materials and supplies inventory records do not accurately represent the quantity and the dollar value of items in its inventory. Over 27 percent of the Department's inventory records contain errors resulting in approximately \$5.9 million of inventory that is either misplaced, misclassified, or overstocked. The Department's goal is to achieve an inventory error rate of 5 percent or less.

Inventory inaccuracies lead to an increased risk that inventory supply levels will be mismanaged:

- There is an increased risk that maintenance projects will be delayed because records indicate the availability of materials and supplies when, in actuality, they do not exist or cannot be located.
- There is a risk that the State's money will not be spent wisely because the Department may not accurately anticipate inventory needs and use the most cost-effective method of purchase.
- There is a risk that inefficient and costly overstocking of inventory items will occur.

The high inventory error rate is attributed to management's failure to emphasize the importance for maintaining accurate inventory records. The Department has well-defined policies and procedures; however, they are inconsistently applied and enforced among districts and maintenance sections. This inconsistency is evidenced by the wide range in error rates among the different maintenance sections (from a low of 12 percent in Bryan to a high of 40 percent in Corpus Christi).

The Department's mission is ". . . to provide safe, effective and efficient movement of people and goods." To successfully achieve this mission, the Department must evaluate all aspects of its operations including inventory management.

The lack of accountability for inventory management contributes to the Department's high inventory error rate. Management does not emphasize the importance of maintaining accurate inventory records. The Department has well-defined policies and procedures; however, they are inconsistently applied and enforced among districts and maintenance sections.

The majority of the maintenance sections we visited within each district were organized and most inventory items were properly labeled and identified. Nevertheless, each district had some maintenance sections that were not organized; inventory was scattered in different locations and not properly identified or labeled with an inventory number. The percentage of inventory items in error at the maintenance sections we visited ranged from 0 to 73 percent.

All of the information necessary for good management of inventory is available through the Department's inventory information system. However, reports available from this system are not consistently used to manage the inventory process. In addition, it appears that those employees responsible for inventory management in the districts are not held accountable for the accuracy of the inventory.

Additionally, the Department's organizational structure and the nature of its operations contribute to the need for enhanced accountability and consistent application and enforcement of policies and procedures. The Department's primary functions of planning, designing, constructing, and maintaining the State's transportation system are accomplished through 25 separate districts and 18 divisions. The districts are geographically located throughout the State, and the divisions are located in Austin. This is a highly complex and decentralized organization where each of the individual districts are organized, staffed, and managed differently. See Appendix 2 for additional information on the organizational structure.

The lack of emphasis on the importance of inventory management is manifested in the following:

- Inconsistent performance of annual physical inventories
- Inconsistent and unreliable reporting of the road sign inventory
- Inconsistent use of maintenance section performance data

Section 1-A:

Inconsistent Performance of Annual Physical Inventories

The districts perform annual physical inventories of materials and supplies, but the information gathered is not consistently used to correct deficiencies or manage the inventory process. The Department requires all districts and regional supply centers to perform annual physical inventories. Various departmental manuals document specific guidance for performing inventories.

However, at one district, the same maintenance sections had significant differences between the counted inventories and the amounts on record for each of the last three years. Our test results verified that significant problems with the inventories at these sections still exist. District management was not using the results of the annual physical inventory to address this recurring problem.

Our testing also revealed that, although one district performed its annual physical inventory, the district did not summarize errors and adjust the inventory information system to reflect actual results. We found no evidence of management's review of the physical inventory results.

Additionally, annual inventories are calculated on the net value of errors. The net value of errors is determined by offsetting the overages and shortages of inventory items identified during actual physical counts. Potentially significant dollar value discrepancies, in the form of shortages and overages, can cancel each other and skew the results. Consequently, inventory management problems may not be detected and

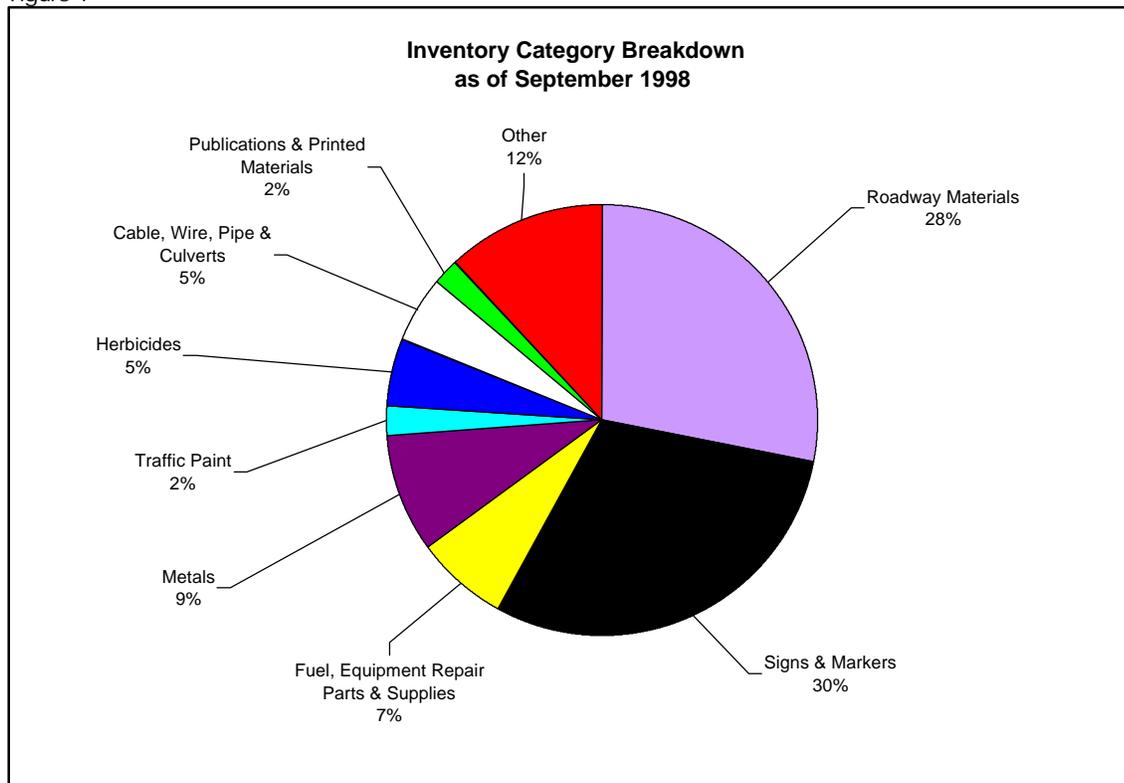
addressed. The risk that maintenance projects are delayed, or that state and federal funds are not used as intended, will continue to exist.

Section 1-B:

Inconsistent and Unreliable Reporting of Road Sign Inventory

The Department cannot accurately measure 11 percent of the \$25.5 million in its signs and markers inventory. Signs and markers make up almost one-third of the Department's entire inventory as shown in the Inventory Category Breakdown (Figure 1).

Figure 1



Source: Texas Department of Transportation, Materials and Supply Management System

These signs and markers are lumped together and recorded on the inventory information system in square feet. However, these items do not lend themselves to be measured in square feet and should be described (such as stop, yield, hazard) and labeled with unique inventory numbers which are already established in the system.

As a result, an increased risk exists that the inventory information system will be overstating or understating the level of inventory for signs and markers. In addition, since management is not able to rely on the inventory information, management may not make correct decisions about which signs need to be ordered and which signs have a surplus that could be shared with other maintenance sections.

Section 1-C:

Inconsistent Use of Maintenance Section Performance Data

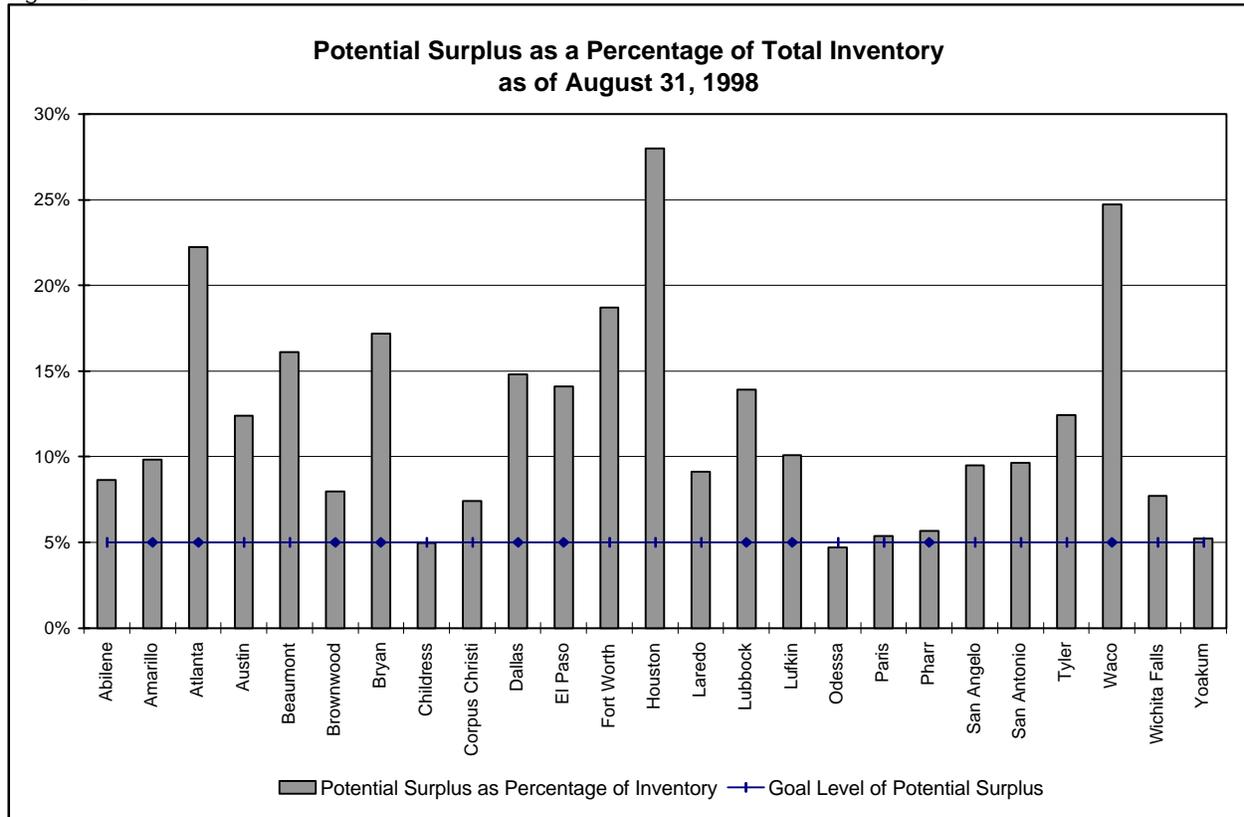
The Department does not use all available inventory performance information to effectively manage its inventory. All needed performance data is collected in the system but is reported only at the district level and not at the individual maintenance section level. Measuring inventory management performance only at the district level enables the results of non-performing sections to go undetected because their performance is averaged with other sections. Consequently, the Department is not managing towards performance goals at the maintenance sections level.

Performance among the maintenance sections tested varied widely. The percentage of inventory items in error at these maintenance sections ranged from 0 to 73 percent. The failure to fully utilize the current performance goals system inhibits management's ability to identify these variances.

One of the Department's performance measures is potential surplus. This value should be as low as possible for an efficient inventory management system. The report used to analyze this performance measure indicates how much potential surplus each district has but, by only analyzing this data at the district level, management cannot identify which maintenance section contributes the most to the surplus. Therefore, it makes it harder for the district to reduce its surplus inventory levels. Figure 2 shows each districts' potential surplus as a percentage of the total inventory.

Potential Surplus is the dollar value of inventory that has not been used in the last 12 months.

Figure 2



Source: Texas Department of Transportation, Inventory Management Summary Report

At the end of fiscal year 1998, the Department had potential surplus inventory totaling \$9.6 million. This amount represents 11 percent of the Department's total inventory as of the same date. The Department has set a goal for potential surplus of 5 percent of the Department's total inventory (\$4.2 million) based on the \$83.6 million in total inventory at the end of fiscal year 1998. If the Department improves performance management, a reduction of potential surplus to the set goal would save approximately \$5.4 million.

Analysis of detailed performance measures at the maintenance section level would provide management with necessary information to detect those sections that do not perform as expected. The Department cannot hold the maintenance section staff accountable for performance variance without this level of analysis. To ensure accountability for inventory management, these measures should be tied to the evaluation of maintenance section staff.

Recommendations:

We recommend that the Department implement the following improvements to strengthen its existing inventory management controls:

1. Develop a risk-based annual plan to perform the spot inventories at maintenance sections currently required under Department procedures. This plan should include risk factors such as the results of annual inventories, personnel turnover, and frequent inventory adjustments. Results of spot inventories should be formally communicated to Area and District Engineers.
2. Enforce the Department's policy for the performance of annual physical inventories. District management should develop a corrective action plan for maintenance sections with high error rates.
3. Calculate the errors found during physical inventories so that overages and shortages do not offset. Use this information to identify maintenance sections with weaknesses in their inventory management.
4. Clarify the inventory policies and procedures in which:
 - Signs can be lumped together and recorded on the inventory information system in square feet.
 - Signs must have unique inventory numbers.

Ensure that all districts enforce this policy at the maintenance sections. The Department should strive to reduce the need to record sign inventories in square feet.
5. Apply specific inventory management measures at the maintenance section level to effectively monitor and evaluate the performance of these sections.

Management's Response:

1. *Concur: Results of annual inventories will be formally communicated to the District Engineers or their designated representatives. Spot inventories are conducted using a sampling technique which selects 50 percent of the sample from items with high demand, 25 percent from items with high value and the remaining 25 percent randomly selected.*

Additionally, complete inventories will be accomplished upon the change of warehouse managers.
2. *Concur. District Engineers are required to insure that all accounts conduct a complete inventory at least annually. Districts will be required to develop plans to insure that inventory discrepancies are researched and corrective action taken and also that a follow-up inventory is conducted on all accounts failing to meet established minimum standards.*
3. *Concur. Currently, the Department's performance measure of inventory accuracy is based on the absolute errors, not the net errors, so that overages and shortages do not offset. These results are maintained on each individual stock account. Additionally, with programming changes, the Department will*

begin tracking dollar value of overages and dollar value of shortages separately, which will be available at all management levels.

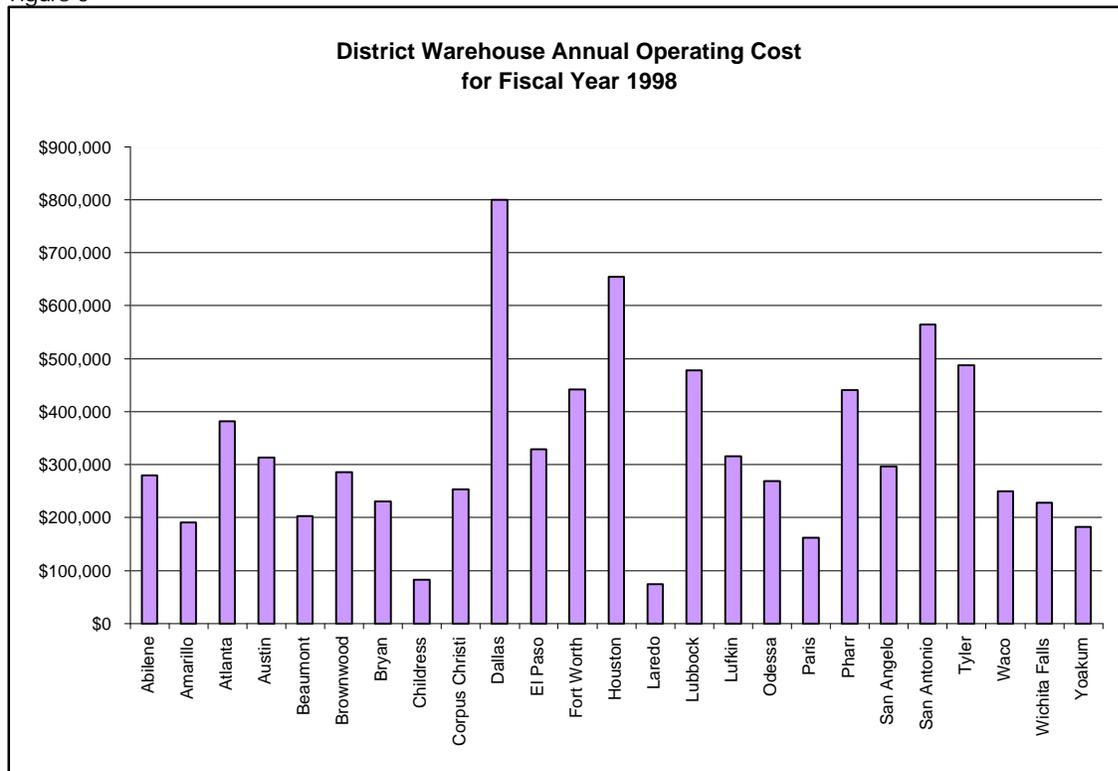
4. *Concur: Standardized policies and procedures will be enacted to insure uniformity in the manner in which signs are maintained in inventory.*
5. *Concur: Performance measures and standards will be available and applicable to all stock accounts, including maintenance sections.*

Section 2:

Opportunities for Cost Savings and Service Improvements Exist

Consolidating district warehouses and reducing inventory levels create an opportunity for a cost savings of \$18.3 million over the next biennium, in addition to improving service and increasing efficiency. The 25 district warehouses could be consolidated into as few as 5 regional supply centers strategically located throughout the State. This consolidation could save up to \$5.3 million annually (see Appendix 4). Operating costs for the district warehouses for fiscal year 1998 range from a low of \$74,000 to a high of \$800,000 as shown in Figure 3. The average cost for fiscal year 1998 is approximately \$328,000.

Figure 3

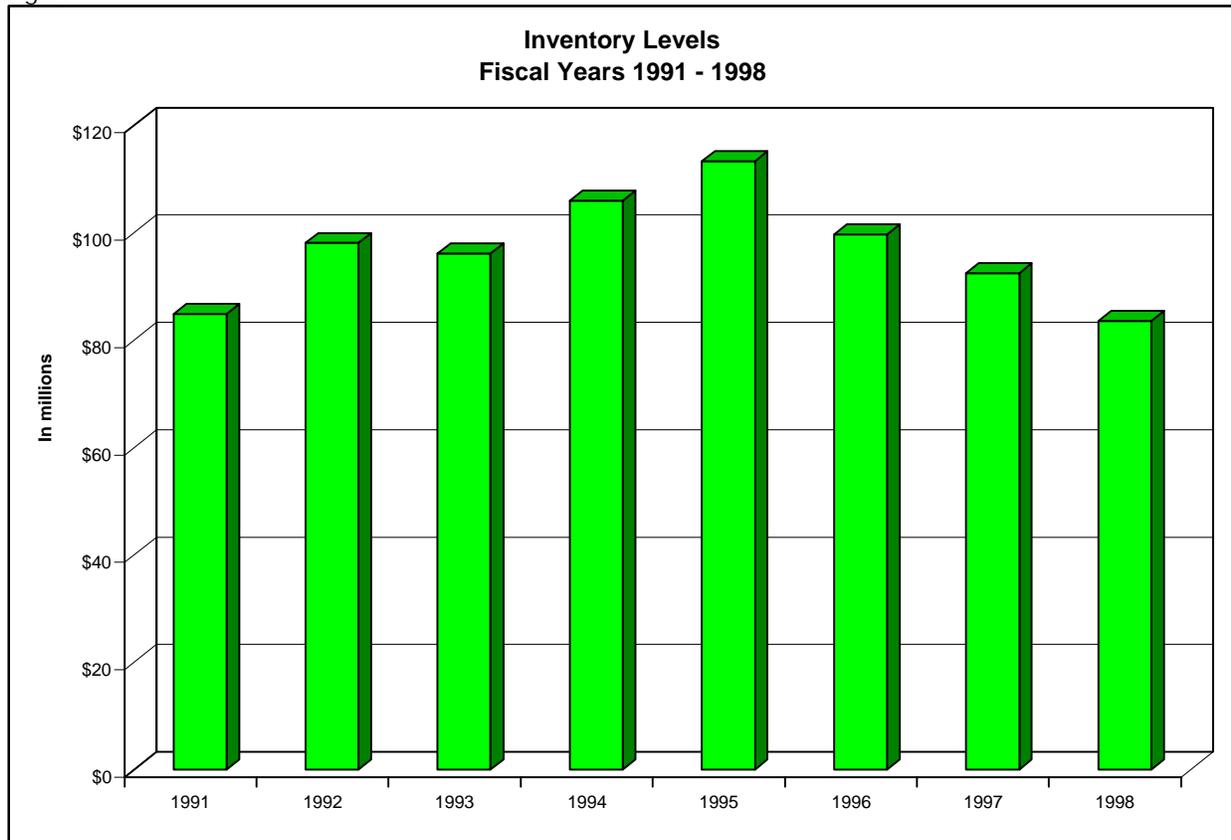


Source: Texas Department of Transportation, Financial Information Management System

Additionally, consolidation would facilitate the continued reduction of total inventory levels that could result in a one-time cost savings of \$7.6 million. The results of the Department's preliminary analysis support this estimate. The consolidation of warehouses will eliminate the need to keep similar items at 25 different locations throughout the State.

As shown in Figure 4, the Department has already reduced its inventory in the last three years from \$113.2 million, in fiscal year 1995, to \$83.6 million, in fiscal year 1998.

Figure 4



Source: Texas Department of Transportation, Materials and Supply Management System

The potential areas for service improvements and increased efficiency include:

- Streamlining the budget, administrative, and procurement processes
- Reducing the delivery time of inventory items, from the supplier to the maintenance section, by eliminating the need for inventory to be delivered to the district warehouses before it is delivered to the maintenance sections
- Reducing transportation costs to ship inventory to maintenance sections

With consolidation, responsibility for managing inventory will shift from the districts to the General Services Division. The General Services Division manages the

regional supply centers that currently supply the district warehouses. The district warehouses, in turn, supply the maintenance section warehouses. This shift in responsibility will allow the districts to concentrate on building and maintaining roads.

The Department is currently analyzing opportunities for cost savings and service improvements resulting from the consolidation of district warehouses including the development of a pilot program. This pilot will assist in more accurately estimating the cost savings resulting from consolidation.

Recommendation:

We recommend that the Department consolidate district warehouses into five regional supply centers and continue its efforts to reduce inventory levels. The Department should develop an action plan incorporating the results from the pilot program including specific target dates for the consolidation of the district warehouses.

Management's Response:

Concur. The Department will evaluate cost effectiveness and support levels during the pilot test of four districts which have 54 individual stock accounts. If the pilot test proves cost effective, the Department will analyze the statewide support requirements to include the possibility of creating additional Regional Support facilities.

Section 3:

Materials and Supplies Inventory Is Protected From Theft and Abuse

The Department provides adequate physical security to minimize the risk of theft and abuse. Despite the inaccuracy of records and problems with the management of materials and supplies inventory, all the districts we visited had the following physical security controls in place:

- Maintenance section facilities were adequately fenced.
- Pilferable inventory items were stored in a locked area inside the warehouse.
- Warehouses had restricted access to authorized personnel.

Although physical security is only one aspect of inventory management, it is vital to the safeguarding of assets.

Recommendation:

We recommend that the Department continue its efforts to protect inventory from theft and abuse.

Management's Response:

Concur. The Department will continue its efforts to protect inventory from theft and abuse.

Section 4:

Equipment Inventory Is Accurate and Adequately Protected

The problems found with the management of materials and supplies inventory do not exist for equipment inventory management. The Department has comprehensive policies and procedures and uses them, along with the existing equipment information system, to ensure that equipment inventory is adequately managed, maintained, and protected from waste and abuse. All equipment we observed was marked with a Department identification number, was accounted for, and was in good condition. In addition, the Department's information system tracks equipment maintenance history which helps ensure that all equipment receives necessary maintenance.

Recommendation:

We recommend that the Department continue its efforts to effectively manage its equipment and protect it from waste and abuse.

Management's Response:

Concur. The Department will continue its efforts to effectively manage its equipment and protect it from waste and abuse.

Objectives, Scope, and Methodology

Objectives

Our objectives were to determine if:

- The Department's management controls for selected segments of inventories and fixed assets were adequate to ensure that these assets were economically purchased, appropriately recognized and valued, and adequately protected from waste and abuse.
- The Department's progress toward achieving its performance goals and objectives relating to inventories and fixed assets was routinely and accurately measured and if this monitoring feedback was used to improve management of these areas as needed.

Scope

The scope of this audit included materials and equipment inventories at 9 of the 25 districts, and 1 of the 4 regional supply centers. We visited 124 maintenance sections. We reviewed the inventory records for the fiscal year ending August 31, 1998. As part of this review, we analyzed the management controls over inventory, equipment, and the related management information systems (the Materials and Supply Management System and the Equipment Operations System).

Methodology

We collected and analyzed information, and performed selected audit tests and procedures.

Information collected:

- Interviews with management and staff of the Department
- Policies and procedures relating to inventory and equipment
- Internal Audit Office reports
- External reports relating to inventory, equipment, and procurement
- Accounting records for inventories and equipment
- Financial information about the Department from the Uniform Statewide Accounting System (USAS)

Procedures and tests conducted:

- Direct testing of inventory and fixed asset systems
- Financial analysis of expenditures related to inventory and equipment.
- Analysis of USAS data
- Review of documentation relating to Department operations

- Review of performance measures
- Trend analysis of budgets, expenditures, and performance statistics
- Control review
- Process flowcharting of Department operations
- Comparison of strategies and budgeted amounts
- Ratio analysis
- Risk-based analysis for selection of districts for testing
- Surveys of management at the 25 districts

Other Information

Fieldwork was conducted from February 1998 through September 1998. The audit was conducted according to applicable professional standards including Generally Accepted Government Auditing Standards.

There were no instances of noncompliance with these standards.

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

- Joanna B. Peavy, CPA (Project Manager)
- Ryan Simpson, MBA (Assistant Project Manager)
- Kevin Hannigan
- Lucien Hughes
- Polly Laoboonmi
- Marios Parpounas
- Jennifer Wiederhold
- Worth Ferguson, CPA (Quality Control Reviewer)
- Frank N. Vito, CPA (Audit Manger)
- Craig D. Kinton, CPA (Audit Director)

Texas Department of Transportation Organizational Structure

Mission

“To work cooperatively to provide safe, effective and efficient movement of people and goods.”

Background

The Legislature created the State Highway Department in 1917 to grant financial aid to counties for highway construction and maintenance. In 1975, the Legislature expanded the Department's responsibilities by combining the Texas Mass Transportation Commission and the State Highway Department to form the State Department of Highways and Public Transportation. In 1991, the Legislature formed the Department by merging the State Department of Highways and Public Transportation, the Texas Department of Aviation, and the Texas Motor Vehicle Commission.

Organizational Structure

The Department's primary functions of planning, designing, constructing, and maintaining the State's transportation system are accomplished through 25 separate districts and 18 divisions. The divisions are geographically located throughout the State and the divisions are located in Austin. This is a highly complex and decentralized organization where each of the individual districts are organized, staffed, and managed differently.

Each district is responsible for the plan, design, location, construction, and maintenance of transportation systems in its area.

The District Engineer supervises several Area Engineers, who, in turn, are responsible for one or more maintenance section locations (see Table 1). In general, each maintenance section has its own warehouse. The table also documents the number of area engineer offices, maintenance sections, and warehouses/supply rooms.

Table 1

Number of Area Engineer Offices and Maintenance Sections by District			
District	Area Engineer Offices	Maintenance Sections	Warehouses/ Supply Rooms
Abilene	4	17	22
Amarillo	4	20	25
Atlanta	6	15	11
Austin	5	19	19
Beaumont	6	14	15
Brownwood	3	11	16
Bryan	4	14	12
Childress	2	14	19
Corpus Christi	5	14	19
Dallas	9	11	14
El Paso	3	8	21
Fort Worth	6	13	18
Houston	9	12	18
Laredo	3	8	15
Lubbock	5	20	23
Lufkin	4	13	15
Odessa	4	16	24
Paris	5	13	13
Pharr	4	11	18
San Angelo	3	12	17
San Antonio	7	19	21
Tyler	6	14	15
Waco	5	10	16
Wichita Falls	5	17	17
Yoakum	4	13	13
TOTALS	121	348	436

Appendix 3:
Detailed Results

The following figures represent the detailed results of our testing. We visited nine districts and reviewed the accuracy of inventories at 124 maintenance sections. Calculated error rates are based on the number of items tested and the total dollar value of the sample.

Figure 5

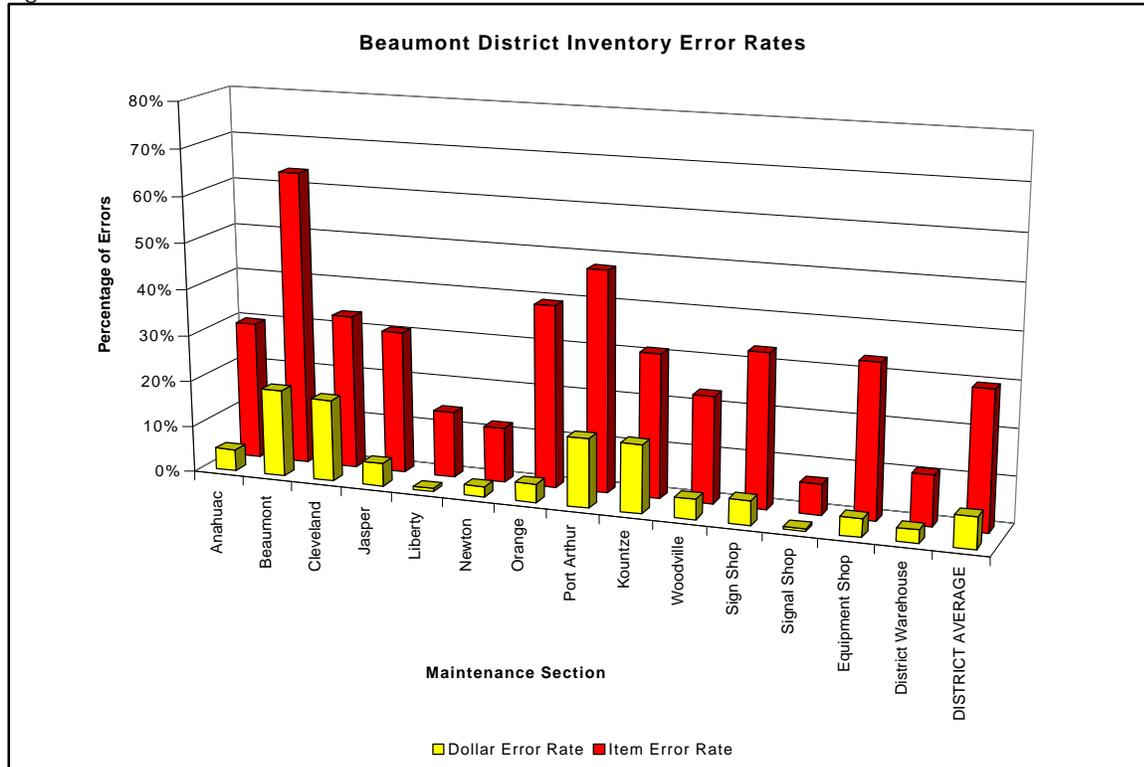


Figure 6

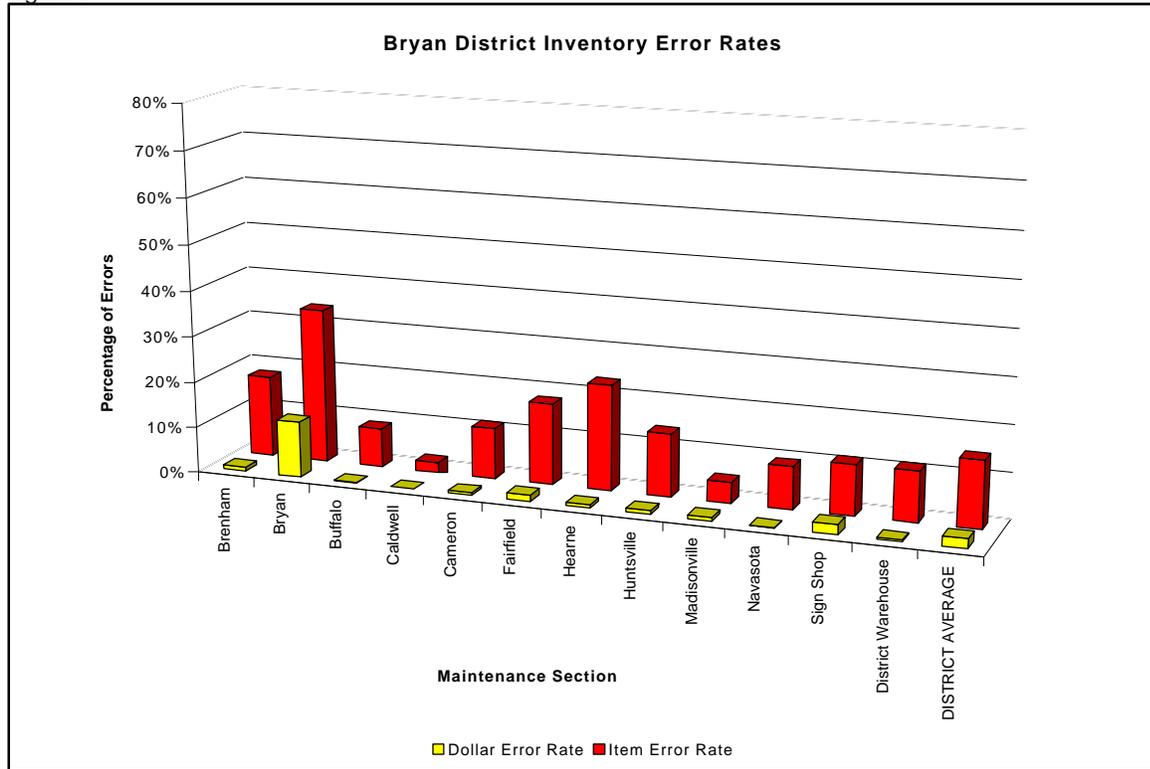


Figure 7

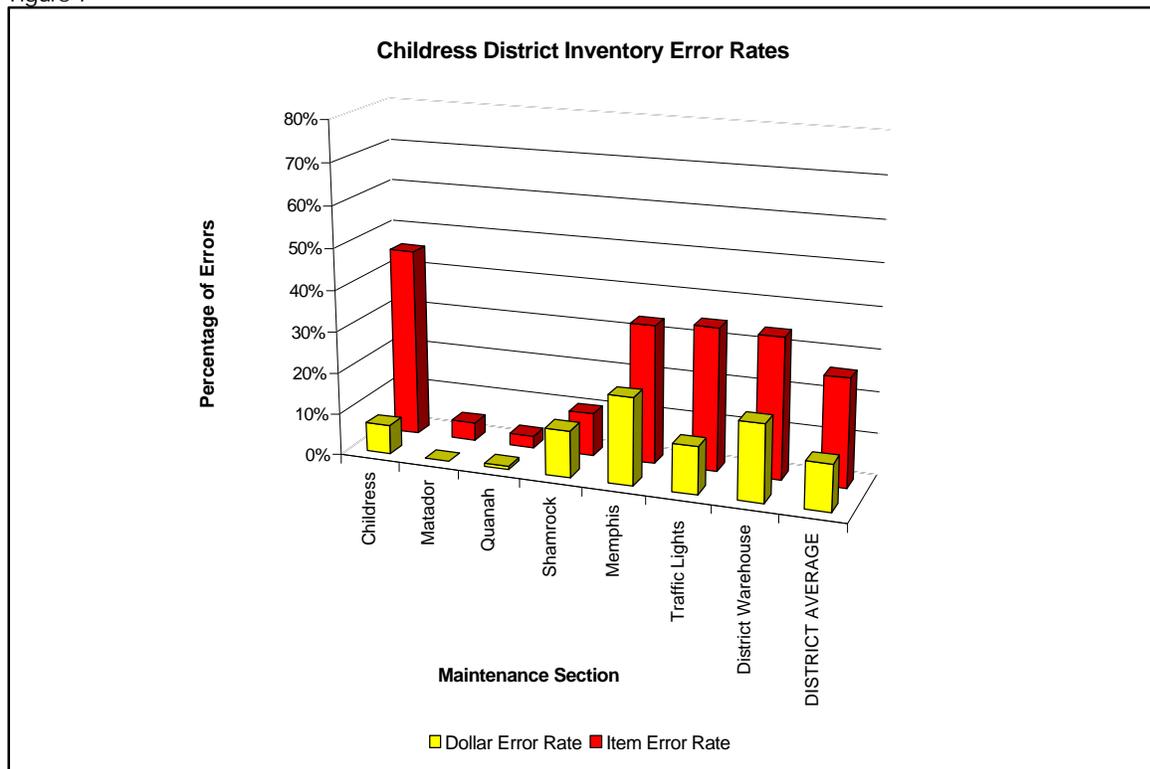


Figure 8

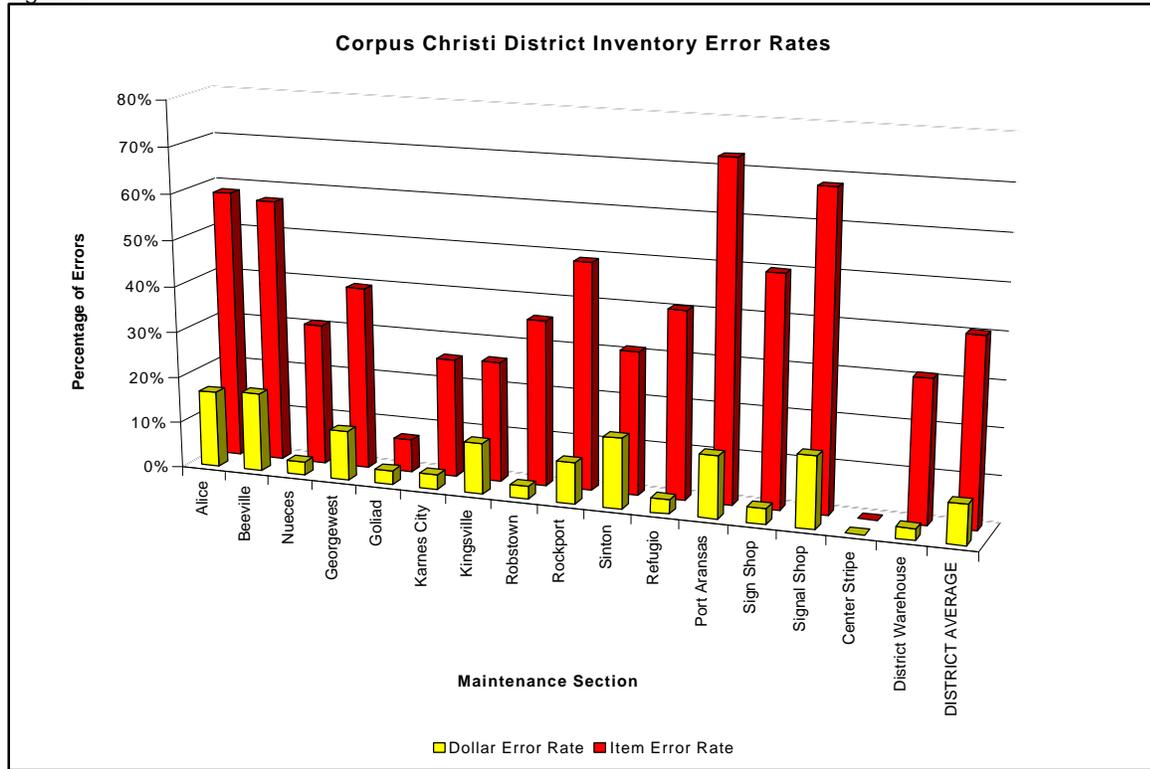


Figure 9

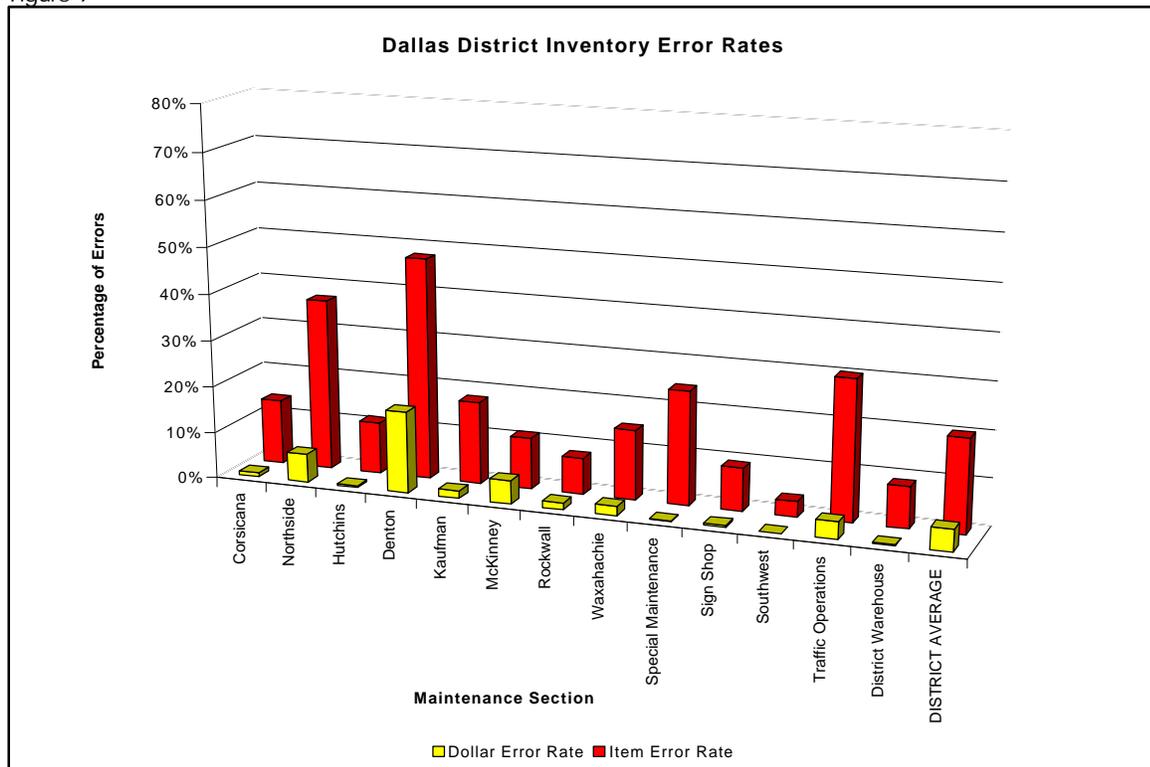


Figure 10

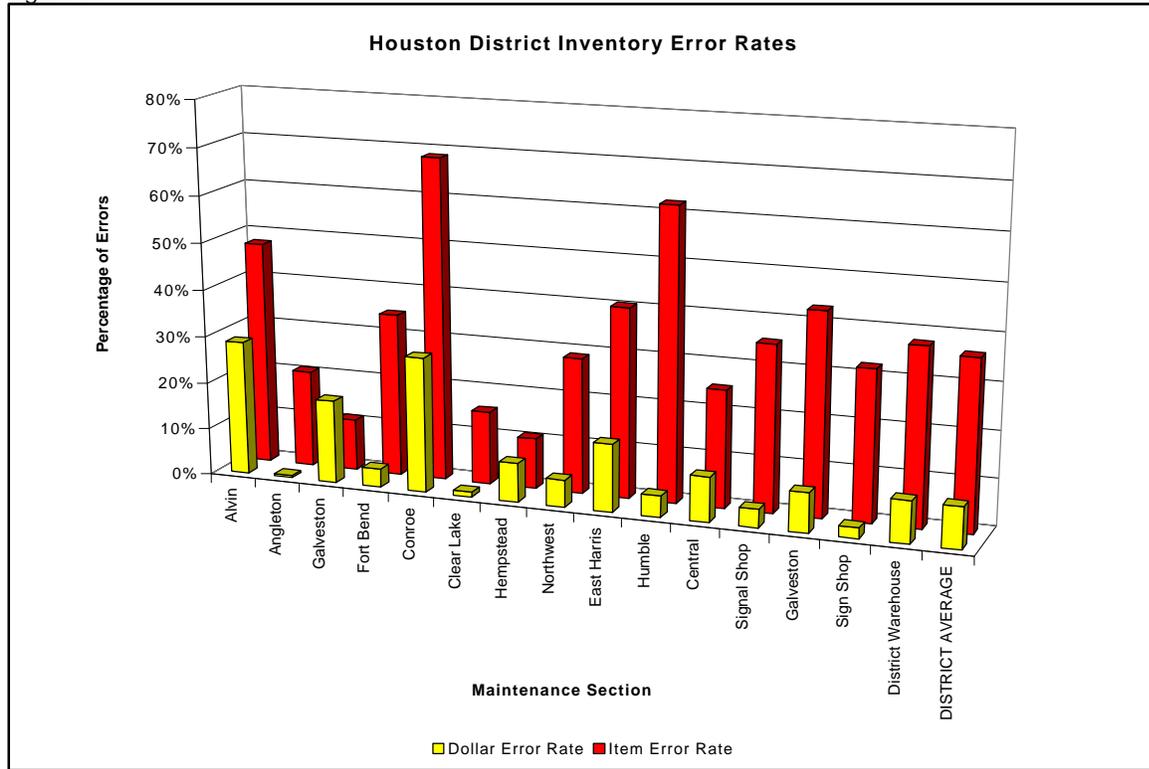


Figure 11

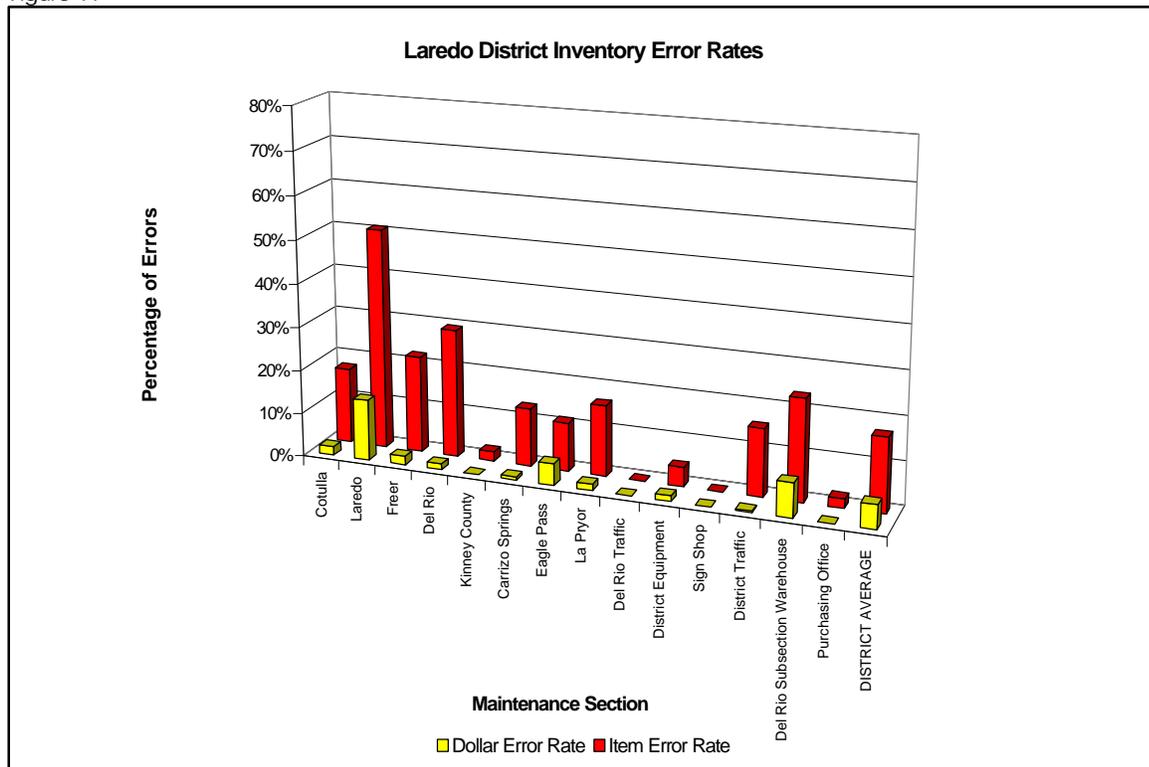


Figure 12

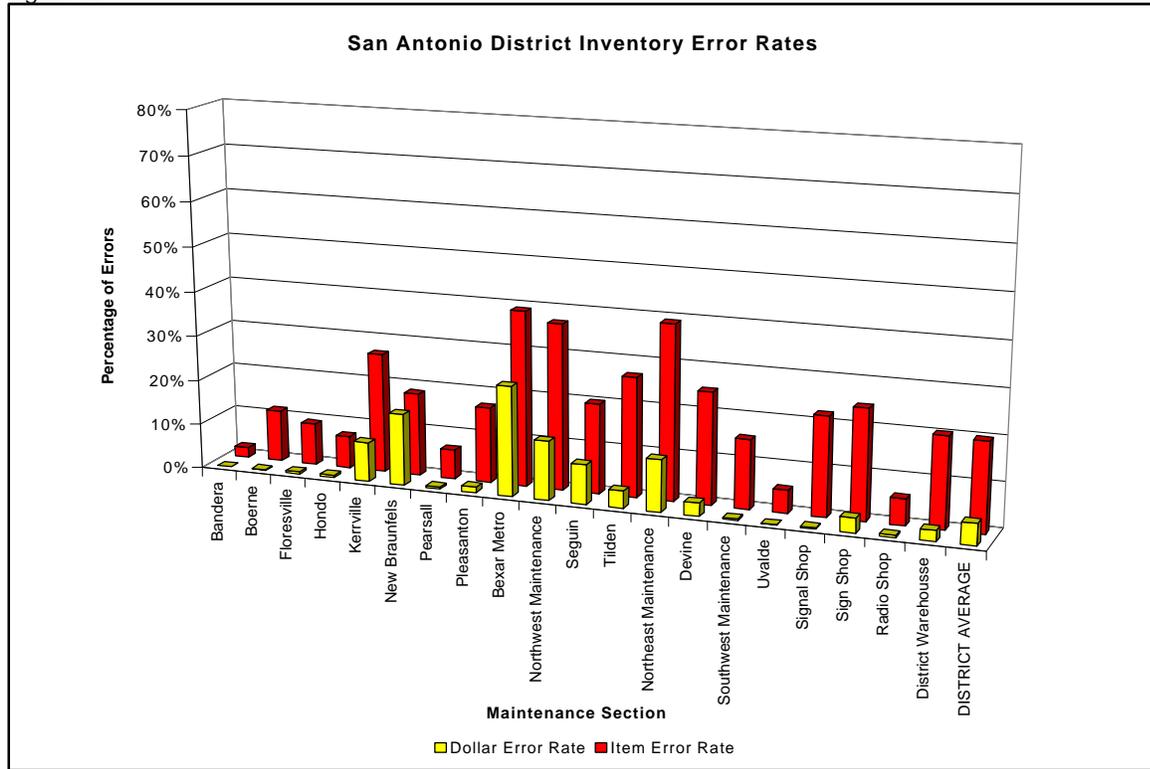
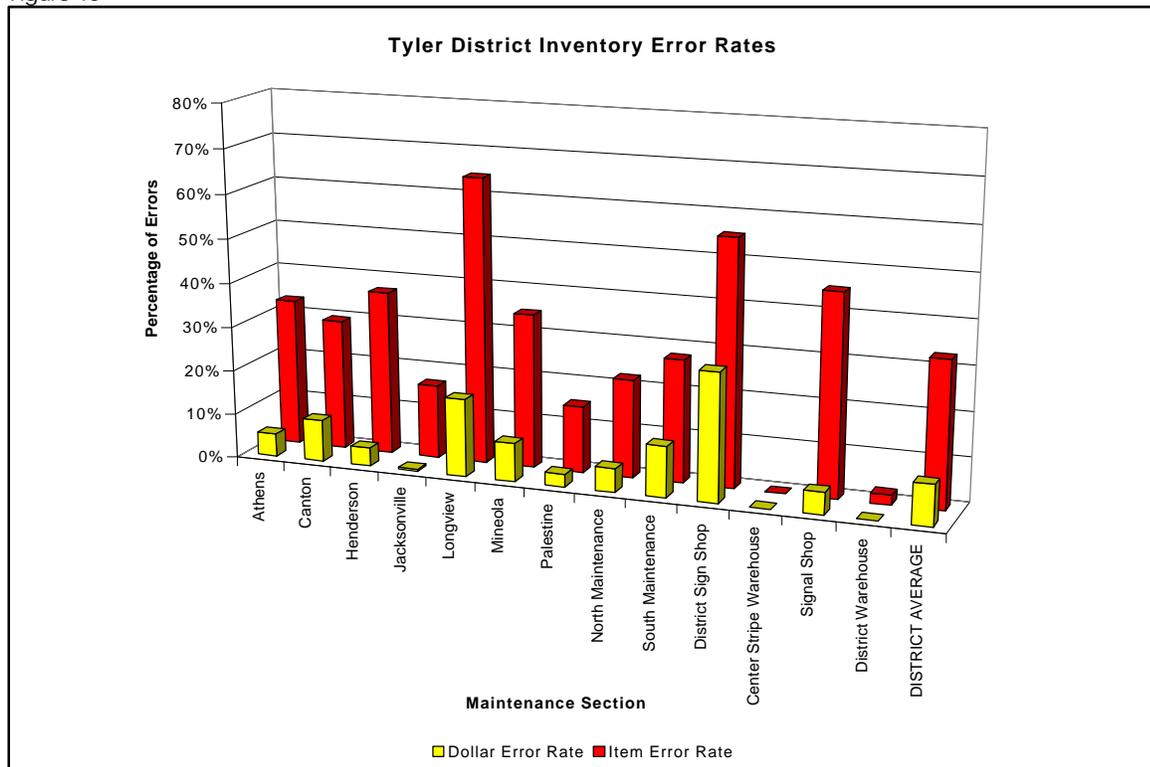


Figure 13



Calculation of Potential Cost Savings from Consolidating District Warehouses

The Department could save an estimated \$5.3 million in annual operating costs by eliminating district warehouses and consolidating them into more regional supply centers. Table 2 shows the calculation of the potential cost savings relating to consolidation of district warehouses.

Table 2

Current Configuration	Cost
25 district warehouses	\$8,200,000 (25 districts x \$328,000 average operating cost)
3 regional supply centers	\$954,000 (3 regional centers x \$318,000 average operating cost)
Current Configuration Total Cost	\$9,154,000

Reduced Configuration	Cost
25 district warehouse operation costs after consolidation	\$1,850,000 (25 district warehouses x \$74,000 ¹ cost of operating former district warehouse – overhead)
5 regional centers	\$1,990,000 (5 regional centers x \$398,000 new average operating cost; assumes 25 percent operating cost increase, \$318,000 old average operating cost + 25 percent cost increase = \$398,000)
Reduced Configuration Total Cost	\$3,840,000
Total Savings	\$5,314,000

If additional regional supply centers must be constructed, at a cost of \$1.5 to \$2 million each, these costs could be recovered from estimated savings within one to two years. Also, total transportation costs to ship materials from additional, strategically-located regional warehouses should be reduced.

¹ Laredo District warehouse activities are already consolidated with those of the San Antonio District. The \$74,000 represents overhead costs associated with operating the Laredo District warehouse after consolidation.

Other Related Reports

The Comptroller of Public Accounts and the General Services Commission independently reviewed the Department's procurement function concurrently with our audit. The methodology for these reviews appeared to examine sufficiently the Department's procurement process. Therefore, we determined that any additional work at this time would not provide additional useful information. The results are included in the following reports:

- Comptroller of Public Accounts - *Post-Payment Audit of Texas Department of Transportation*, dated March 1, 1998
- General Services Commission - *Procurement Review*, dated October 6, 1998

In addition, the Department's Internal Audit Office issued the *Audit Report on the Construction Function Utilization of Resources – Area Office Operations*, dated November 27, 1996. This report identified areas for improvement in the Department's procurement process.

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