

PERFORMANCE AUDIT

**DEPARTMENT OF TRANSPORTATION**

EQUIPMENT MANAGEMENT

Report to the Arizona Legislature  
By the Auditor General  
October  
87-9

DOUGLAS R. NORTON, CPA  
AUDITOR GENERAL

STATE OF ARIZONA  
OFFICE OF THE  
AUDITOR GENERAL

LINDA J. BLESSING, CPA  
DEPUTY AUDITOR GENERAL

October 1, 1987

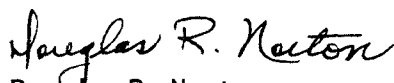
Members of the Arizona Legislature  
The Honorable Evan Mecham, Governor  
Charles L. Miller, Director  
Arizona Department of Transportation

Transmitted herewith is a report of the Auditor General, A Performance Audit of the Arizona Department of Transportation (ADOT) equipment management function. This report is in response to a July 26, 1985, resolution of the Joint Legislative Oversight Committee.

The report addresses three areas in which ADOT can improve its fleet management. We found that ADOT could reduce its fleet of cars and pickups by 195 vehicles, thereby improving vehicle utilization. We also found that \$1 million worth of equipment sat idle for excessive lengths of time before being placed into service; vehicles have been delayed up to two and one-half years. Finally, we found that ADOT Equipment Services' Central Shop is keeping equipment too long for repairs, and we recommend improvements which should help to decrease downtime.

My staff and I will be pleased to discuss or clarify items in the report.

Respectfully submitted,

  
Douglas R. Norton  
Auditor General

Staff: William Thomson  
Peter Francis  
Martha Dorsey  
Deborah Klein  
Vivian Look  
Mark Andrews  
Ron Johnson

## SUMMARY

The Office of the Auditor General has conducted a performance audit of the Arizona Department of Transportation (ADOT) equipment management function in response to a July 26, 1985, resolution of the Joint Legislative Oversight Committee. This performance audit is one in a series of audits on ADOT, and was conducted as part of the Sunset Review set forth in Arizona Revised Statutes §§41-2351 to 41-2379.

ADOT owns and maintains a fleet of approximately 3,450 pieces of equipment, with a total estimated replacement cost of \$64 million. The fleet consists of heavy equipment such as loaders, graders and snowplows, and lighter equipment, including a large passenger fleet. The Equipment Services Section is responsible for purchasing, maintaining and disposing of the equipment. However, according to Equipment Services officials, it does not have authority to control the size of the fleet.

**Approximately 195 Cars And Trucks Could Be Eliminated From Its Fleet If ADOT Improved Efficiency and Did Not Replace Underutilized Vehicles** (see pages 5 through 15)

More than 15 percent of ADOT's cars and light trucks are underutilized and could be eliminated from ADOT's fleet, saving more than \$1.7 million in replacement costs alone. Based on a conservative measure of usage, we determined that ADOT could reduce its fleet by an estimated 195 vehicles. We believe this estimate is conservative because observations of construction field offices revealed that nearly 35 percent of assigned vehicles sat idle at each observed time during the day. The practice of assigning vehicles to individuals rather than pooling or using other alternatives contributes to the low usage. ADOT should require or encourage its employees to use alternative methods of transportation, including pooling vehicles and using personal cars.

Although ADOT has been aware of problems with underutilization, it has not taken sufficient action since our previous audit. In response to our 1983 audit, ADOT

reduced the number of heavy equipment units in its fleet, and reduced the number of planned purchases of cars and pickups. However, ADOT did not develop a utilization standard, and vehicle usage is not routinely reviewed. Further, the administrator of Equipment Services had not been given authority to recall or transfer any equipment that was underutilized or not justified. As a result, percentage of vehicles with low utilization (less than 1,000 miles per month) has increased from 43 to 48 percent.

**ADOT Has Allowed \$1 Million Worth Of New Equipment To Sit Idle Too Long Before Placing It Into Service; Individual Units Have Been Delayed From Six Months To Two And One-Half Years** (see pages 17 through 23)

Ninety-two pieces of equipment worth approximately \$1 million at purchase have remained unused for six to 30 months before being placed into service. In contrast, other large fleet operations set goals of issuing new equipment well under two months. The following case examples illustrate the ADOT delays.

- In August 1984 ADOT accepted delivery of a number of 1-ton truck chassis, to which special beds were to be added. Five of these chassis, costing a total of \$48,000 at purchase, were not issued to users until January 1987.
- In mid-1985 ADOT accepted delivery of still more 1-ton truck chassis. As of June 24, 1987, 11 of these chassis were still on the Equipment Services lot, awaiting fabrication and attachment of special bodies.

Equipment Services' failure to issue equipment in a timely manner has resulted in wasted State funds as well as problems for some users. At a minimum, such extensive delays have led us to question whether several vehicles were really needed, at least at the time the purchases were made. Poor management and planning appear to have caused the excessive delays in issuing new equipment.

**ADOT Could Reduce Equipment Downtime And Speed Repair Of Equipment Critical To Users** (see pages 25 through 32)

The amount of time critical highway maintenance equipment is in the Central shop for repairs is excessive. In extreme instances, equipment considered by highway maintenance foremen to be critical to their operations spent 100 days or more during a recent 12-month period in Equipment Services' central repair shop. A

combination of factors have caused this equipment to experience unnecessary downtime. Inadequate shop procedures for repair scheduling and tracking have contributed to the downtime. Changes that could decrease downtime include contracting out more repairs, keeping the shops open at night, improving the availability of parts for repairs, and evaluating equipment refurbishing decisions.

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION AND BACKGROUND . . . . .	1
FINDING I: Approximately 195 Cars and Trucks Could Be Eliminated From Its Fleet If ADOT Improved Efficiency and Did Not Replace Underutilized Vehicles. . . . .	5
Utilization Criteria . . . . .	5
Construction Fleet Could Be Reduced By Nearly 17 Percent . . . . .	6
Other ADOT Vehicles Could Also Be Eliminated. . . . .	11
Options Are Available To Meet Needs . . . . .	12
ADOT Has Taken Insufficient Action To Control Fleet Size. . . . .	13
Recommendations . . . . .	15
FINDING II: ADOT Has Allowed \$1 Million Worth Of New Equipment To Sit Idle Too Long Before Placing It Into Service; Individual Units Have Been Delayed From Six Months To Two and One-Half Years . . . . .	17
Excessive Delays In Issuing Some Equipment . . . . .	17
Excessive Delays Have Resulted In Waste Of State Funds . . . . .	21
Equipment Services Has Mismanaged New Equipment Preparation . . . . .	22
Recommendations . . . . .	23
FINDING III: ADOT Could Reduce Equipment Downtime And Speed Repair Of Equipment That Is Critical To Users . . . . .	25
Critical Equipment Is Down Excessively, Impeding User Operations and Increasing Costs . . . . .	26
ADOT Could Improve Fleet Availability By Improving Shop Procedures and Management Policies . . . . .	27
Recommendations . . . . .	32
OTHER PERTINENT INFORMATION . . . . .	33
AREAS FOR FURTHER AUDIT WORK . . . . .	35
AGENCY RESPONSE . . . . .	37

LIST OF TABLES

	<u>Page</u>
TABLE 1 - ADOT Equipment Services Section FTEs And Operating Budget Fiscal Years 1984-85 Through 1987-88. . . . .	3
TABLE 2 - Summary Of Idle Vehicles Observed In District I Construction Field Offices (Orgs) On June 16, 1987. . .	8
TABLE 3 - Summary Of Equipment Issues Delayed Six Months Or Longer Since 1984 . . . . .	20

LIST OF FIGURES

	<u>Page</u>
FIGURE 1 - Vehicles Idle At A District I (Phoenix) Construction Field Office (Org) On June 24, 1987. . . . .	10
FIGURE 2 - A 1985 Truck Chassis, Still Unused As Of June 24, 1987 . . . . .	18
FIGURE 3 - A 1986 Crewcab Pickup Still Unused As Of June 24, 1987 . . . . .	19

## INTRODUCTION AND BACKGROUND

The Office of the Auditor General has conducted a performance audit of the Arizona Department of Transportation (ADOT), equipment management function in response to a July 26, 1985, resolution of the Joint Legislative Oversight Committee. This performance audit is one in a series of audits on ADOT, and was conducted as part of the Sunset Review set forth in Arizona Revised Statutes §§41-2351 through 41-2379.

ADOT owns and maintains a fleet of approximately 3,450 pieces of equipment, with an estimated replacement cost of almost \$64 million. Included in the fleet are approximately 730 pieces of heavy equipment such as loaders, graders, snowplows, and dump trucks; 1,310 light vehicles consisting mainly of a passenger fleet; and 1,410 nonmotorized and specialized equipment units such as utility trailers, compressors and generators.

### Responsibility For Equipment Management Within ADOT

The Equipment Services Section (ESS) is responsible for purchasing, maintaining and disposing of ADOT's equipment fleet. The Section, organized under ADOT's Highways Division, operates 11 major maintenance shops and five other smaller shops throughout the State. All 16 shops perform repairs and preventive maintenance on equipment located in their areas. Equipment Services' Central Shop, located in Phoenix, has the additional duties of preparing new equipment to be distributed statewide, refurbishing selected pieces of older equipment to be placed back into service, and disposing of old equipment for which ADOT has no further use. The Central Shop also performs some repairs that the other three districts are unable to handle, usually due to the difficulty of the work.

The Equipment Services Section's primary goals and objectives are as follows.

- Provide the Department of Transportation with an efficient, effective and well managed equipment fleet



- Provide ADOT with data related to equipment and equipment cost
- Maintain all equipment in the fleet
- Constantly monitor, modify, update, and improve operating methods and maintenance records

However, according to Equipment Services, the Section does not have authority to control the size of the equipment fleet. Such responsibility apparently rests with either the districts or ADOT's upper management (see Finding I, page 5).

Since 1970, ESS has operated with a revolving fund established by law. Revenues are generated largely from equipment user fees and fleet disposals. Approximately \$23 million in revenues are generated annually, and according to the administrator about 58 percent of this comes from highway maintenance operations. Funds are used for all expenditures made by ESS, including equipment acquisitions, repairs and operating expenses. ESS operates with an annual budget of about \$25 million. It employs about 180 people. Table 1 (see page 3) presents the Section's operating budget and number of full-time equivalent personnel (FTEs) for fiscal years 1984-85 through 1987-88.

#### **Recent Effort To Update Equipment Fleet**

Equipment Services has been increasing its purchases of new equipment over the past four years, to replace a reportedly aged fleet. Equipment purchases have increased from approximately \$4.1 million in fiscal year 1983-84 to an estimated \$11.2 million in fiscal year 1986-87. During this time, according to data supplied by Equipment Services officials, the Section replaced approximately half of the total equipment units owned by ADOT. According to Equipment Services officials, equipment purchases are planned to remain at more than \$9 million for the next two fiscal years.

TABLE 1  
 ADOT EQUIPMENT SERVICES SECTION  
 OPERATING BUDGET AND FTEs  
 FISCAL YEARS 1984-85 THROUGH 1987-88  
 (Unaudited)

	<u>1984-85</u> <u>Actual</u>	<u>1985-86</u> <u>Actual</u>	<u>1986-87</u> <u>Estimate</u>	<u>1987-88</u> <u>Estimate</u>
FTE positions	177	177	177	185
<u>Expenditure Classification:</u>				
Personal services	\$ 3,994,000	\$ 4,198,700	\$ 4,319,400	\$ 4,622,400
Employee-Related	987,300	1,028,300	1,089,400	1,096,400
Professional and Outside Services	183,800	183,800	95,000	97,400
Travel				
In State	55,100	55,200	82,900	82,900
Out of State	4,700	4,900	5,600	7,700
Other Operating	7,736,400	8,370,700	8,821,700	9,155,800
Equipment	<u>7,173,700</u>	<u>8,538,000</u>	<u>12,200,000</u>	<u>9,054,400</u>
TOTALS	<u>\$20,135,000</u>	<u>\$22,379,600</u>	<u>\$26,614,000</u>	<u>\$24,117,000</u>

Source: ADOT Equipment Services Operating Budget documents for fiscal years 1984-85 through 1987-88.

### Audit Scope And Purpose

Our audit work focused on the following issues.

- Whether ADOT's passenger fleet is sufficiently utilized, and whether utilization is adequately controlled
- The extent of delay in preparing and issuing new equipment to ADOT users
- Whether the amount of time critical highway maintenance equipment is down for repairs is excessive

We also developed Other Pertinent Information regarding the automated information system used by the Equipment Services Section (page 37). Due to time constraints, we were unable to address all potential issues identified during the audit. The section Areas for Further Audit Work (page 39) describes these potential issues.

This audit was conducted in accordance with generally accepted governmental auditing standards.

The Auditor General and staff express appreciation to the Director of the Department of Transportation and his staff for their cooperation and assistance during the course of our audit.

## FINDING I

### APPROXIMATELY 195 CARS AND TRUCKS COULD BE ELIMINATED FROM ITS FLEET IF ADOT IMPROVED EFFICIENCY AND DID NOT REPLACE UNDERUTILIZED VEHICLES

More than 15 percent of ADOT's cars and trucks are underutilized and could be eliminated from ADOT's fleet, saving more than \$1.7 million in replacement costs alone. ADOT could reduce its construction fleet by an estimated 78 vehicles. An additional 117 vehicles assigned throughout other areas of ADOT also appear unnecessary. ADOT could make reductions and still meet all transportation needs by adopting more efficient practices, such as greater use of motor pool vehicles to meet short-term or seasonal requirements. Although ADOT was made aware of problems with underutilization in our 1983 audit, it has failed to take sufficient action.

ADOT has a large fleet of light vehicles. ADOT light vehicles include sedans and pickups, vans and four-wheel-drive vehicles less than 1 ton. As of March 1987, 1,265 assigned vehicles, or nearly 60 percent of ADOT's equipment fleet, fell into these categories.

#### Utilization Criteria

We adopted a conservative measure of usage based on standards widely accepted by fleet managers. Utilization is best measured by reviewing the number of miles a vehicle is driven and the amount of time the vehicle is in use.

Vehicles driven less than 1,000 miles per month are generally considered underutilized. The Department of Administration's motor pool fleet manager indicated that the need for vehicles driven less than 1,000 miles per month is questionable. ADOT also uses 1,000 miles per month as a standard. According to the administrator of Equipment Services, the Section plans for equipment replacement assuming vehicles will accumulate 1,000 miles per month.

Adopting a more conservative criteria, we considered any vehicle driven less than 500 miles per month unnecessary and uneconomical. When vehicle mileage is this low, it is more cost-efficient to consider other alternatives such as pooling vehicles or reimbursements for use of personal vehicles. Both the Department of

Administration motor pool and ADOT Equipment Services managers consider vehicles averaging less than 500 miles per month clearly underutilized. In fact, ADOT's Productivity Resource Management System (PRMS) group, which also reviewed equipment utilization, adopted 1,000 miles a month as its standard and considered vehicles averaging less than 500 miles as extremely underutilized.

We also adopted a conservative standard based on daily use. We considered any vehicle driven 10 days per month or less underutilized. By adopting more efficient practices, half of these vehicles could be eliminated. We assumed approximately 22 working days in any given month. Therefore, average vehicle use of 10 days a month or less shows clear underutilization. Eliminating half these vehicles would bring the combined utilization for this group to fewer than 20 days per month. We further tested this analysis for reasonableness through observations. Observations of actual usage showed this analysis to be conservative since it does not account for duration of use. For example, if a vehicle is used only one hour during a day and is idle for the remaining hours, the vehicle is still credited for a day's use.

#### **Construction Fleet Could Be Reduced By Nearly 17 Percent**

ADOT could reduce its construction fleet by an estimated 78 vehicles, thus saving ADOT more than \$700,000 in replacement costs. Construction orgs <sup>(1)</sup> have far more vehicles than needed, as evidenced by the low mileage and infrequent use. Our observations of construction field offices indicate that our recommendation to reduce the construction fleet by nearly 17 percent may actually be conservative.

ADOT's construction vehicles represent a major portion of ADOT's fleet. Of the 1,265 automobiles and light pickups assigned in March 1987, 464 (37 percent) were assigned to construction orgs. Construction orgs are responsible for quality control of contracted work, and construction staff use vehicles to commute to construction project sites to inspect the contractors' work.

---

(1) Construction orgs are management units responsible for overseeing construction projects.

Construction orgs have too many vehicles - Construction orgs have nearly 17 percent more vehicles than are needed. Seventy-one vehicles average less than 500 miles a month, and an additional 14 vehicles with mileage above 500 miles a month average less than 10 days use per month. By not replacing all vehicles averaging less than 500 miles a month and half of those with usage less than 10 days, ADOT could eliminate 78 vehicles. Since the average replacement cost for ADOT vehicles is \$9,067, ADOT could save more than \$700,000 by eliminating these vehicles.

Inefficient use - Our observations of construction field offices indicate that our recommendation of a 17 percent reduction in construction org vehicles may actually be based on a conservative estimate of the number of vehicles underutilized. To determine if vehicle fleet size could be reduced, we observed construction orgs in District I.<sup>(1)</sup> Our staff conducted observations of nine District I construction org offices on Tuesday, June 16, 1987. Each construction org was observed from 3 to 5 times between 7:30 a.m. and 1:30 p.m., and the number of vehicles in the lot were recorded. Since each construction org office has construction projects in progress, and has a day shift operating during our observation hours, vehicle usage should have been optimal. However, we found that an average of eight vehicles, or nearly 35 percent of assigned vehicles, were parked in construction lots each observed time during our observations. The results of the analysis are summarized in Table 2.

---

(1) Analysis based on observations of construction orgs in District 1 would result in the most conservative estimates of underutilization since the District is the busiest in the State, has about 50 percent of all construction vehicles, and shows some of the highest daily usage of its vehicles.

**TABLE 2**  
**SUMMARY OF IDLE VEHICLES OBSERVED IN**  
**DISTRICT I CONSTRUCTION FIELD OFFICES (ORGS) ON JUNE 16, 1987**

<u>Construction Org No.</u>	<u>Average Number of Idle Vehicles Observed</u>	<u>Total Number of Vehicles Assigned</u>	<u>% of Assigned Vehicles Idle In Org Lot</u>
4140	7.0	21	33.3
4141	9.2	33	27.9
4142	10.6	24	44.2
4143	6.7	20	33.5
4144	12.7	28	45.4
4145	1.5	4	37.5
4146	8.6	20	43.0
4147	10.4	37	28.1
4148	<u>7.6</u>	<u>23</u>	<u>33.0</u>
AVERAGE	<u>8.1</u>	<u>23.3</u>	<u>34.8</u>

Source: Observations conducted by Auditor General staff. The number of vehicles assigned was obtained from the Equipment Services report, "Reported Usage Past 12 Months by Org as of March 1987."

District I's practice of assigning vehicles to individuals contributes to low usage. Currently, District I construction orgs assign vehicles to individuals rather than pooling vehicles. Vehicles are often assigned to individual staff based on seniority. Thus if an individual who is assigned a vehicle is in the office or on leave for a day, the vehicle may remain idle in the parking lot. This is confirmed by our interviews with resident engineers.<sup>(1)</sup> We asked the resident engineers why the vehicles we

(1) Resident engineers are in immediate charge of one or more construction projects. It is their responsibility to ensure that projects are constructed in accordance with plans and specifications.

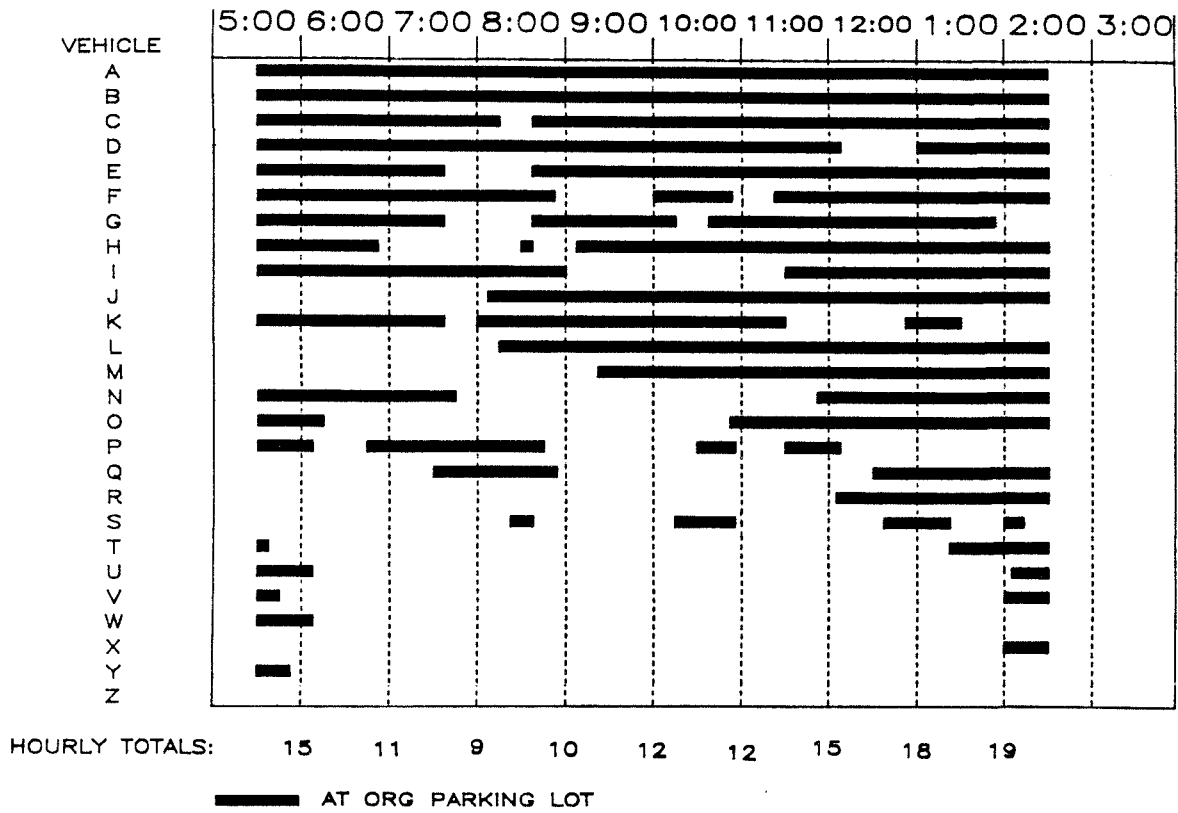
observed were parked at the org office during the day of our observation. Reasons provided by the resident engineers included: assigned user was conducting office work, user was sick or on leave, user works the night shift, or vehicle observed was currently unassigned.

Although some resident engineers have indicated that pooling of vehicles would be difficult, we found that vehicles could be readily shared. Currently, staff who do not have assigned vehicles pool with staff who are assigned vehicles. Numerous vehicles are only used for short periods of time and are left idle much of the workday. Further, even during shift changes, there are still several vehicles available. Finally, equipment needed by construction inspectors is minimal and could be readily transferred from one vehicle to another. We conducted observations to verify ADOT's ability to pool vehicles, with the results as follows.

- **Observation of daily usage** – Observations were conducted to verify whether vehicles were in use most of a workday. The construction org chosen was an org that had utilization figures above our standard. Of the 26 vehicles assigned, 22 averaged more than 500 miles per month and only one vehicle was used fewer than 10 days per month. Auditors observed vehicles for an entire work shift between 5:30 a.m. and 2:30 p.m. Although most of the vehicles were used at some point during the day, the duration of use was often minimal. Further, the number of cars in the lot ranged from a low of nine to a high of 19 at the end of the shift. The observation showed that even though the construction org had only one vehicle used fewer than 10 days per month, the amount of time that vehicles are in use is often limited. Figure 1 presents the results of our observation.
- **Observation of shift change** – We observed an org to determine whether shift vehicles could be shared. According to one resident engineer, his night shift generally included eight staff who worked until 6 a.m. and six staff who worked from 5 a.m. to 1:30 or 2:30 p.m. He indicated that the vehicles could not be shared because of the shift overlap. We observed the site from 4:40 a.m. to 6:20 a.m. and found that between 5 a.m. and 6 a.m., there were no fewer than eight vehicles parked in the lot. Only one ADOT vehicle that could have been assigned to the night shift entered the yard between 5 a.m. and 6 a.m. Further, the staff indicated that the night crew is on a rotating basis and all employees do not work every night.
- **Examination of equipment needed by construction inspectors** – We examined whether the size or amount of equipment used by construction inspectors precluded their ability to share vehicles. Some resident engineers indicated construction inspectors need separate vehicles to transport special equipment and tools. We interviewed construction org personnel and observed vehicles at construction sites and found only a limited number of inspectors need to carry significant equipment in the back of their vehicles on a regular basis. The tools used by inspectors are essentially the same and include minor first aid materials, tape measures, plans, manuals, flashlights, and levels. All of the equipment and tools can be transferred among vehicles.



**FIGURE 1**  
**VEHICLES IDLE AT A DISTRICT I (PHOENIX)**  
**CONSTRUCTION FIELD OFFICE (ORG) ON JUNE 24, 1987**



Source: Auditor General observation of District I org on June 24, 1987.

**ADOT lacks control over construction fleet size** - By not exercising proper control, ADOT allows construction orgs to retain unnecessary vehicles. Equipment Services, the Section responsible for fleet management, does not monitor or otherwise control vehicle assignments. No other unit within ADOT's central office exercises control over assignments. As a result, orgs are not discouraged from retaining unneeded vehicles. Several org officials indicated that they had unneeded vehicles that could be reassigned to other construction orgs. One org official indicated that he had two extra vehicles. Another, a resident engineer, indicated that he would not notify anyone if he had an extra vehicle but would wait until another construction org contacted him.

As further evidence of the lack of control, an analysis of the ratio of vehicles to staff shows that some construction orgs have more vehicles than ADOT's own policy permits. As of March 1987, 17 of the construction orgs had ratios of vehicles to staff that exceeded ADOT's own standards of .85 for rural orgs and .75 for urban orgs. In fact, five orgs had at least one vehicle per staff member.

**Other ADOT Vehicles  
Could Also Be Eliminated**

In addition to the extra construction vehicles, ADOT has approximately 117 underutilized vehicles in other agency units valued at more than \$1 million.

**More nonconstruction vehicles than needed** – ADOT has far more nonconstruction vehicles than is necessary as evidenced by low mileage and usage. ADOT could reduce the size of its nonconstruction fleet by 117 vehicles. Our review of vehicle mileage for the one year period of April 1986 through March 1987 shows that ADOT has 89 nonconstruction vehicles with usage less than 500 miles a month. ADOT has an additional 57 vehicles with mileage above 500 miles per month, but which had an average usage of less than 10 days per month.<sup>(1)</sup> By taking half of those with usage less than 10 days, ADOT could eliminate another 28 vehicles. Since the average replacement cost for ADOT vehicles is \$9,067, ADOT could save more than \$1 million by eliminating the 117 vehicles.

---

(1) Our analysis of vehicles with less than 10 days use excluded motor pool vehicles because of the lack of data. Thus, the reported number of vehicles with less than 10 days use is a conservative figure.

Underutilized vehicles are found in numerous ADOT sections, including the ADOT motor pool, the Motor Vehicle Division, various districts, Arizona Highways magazine and Equipment Services. For example, the Motor Vehicle Division has two vehicles assigned to a TARGATS project, which are used to commute between project offices. One vehicle is left parked at 1801 W. Jefferson, while the other is located at 801 E. Jefferson. One vehicle only accumulates an average of 244 miles a month, and the other is driven about 190 miles a month. In this case, alternative modes of transportation, such as use of a personal car or the bus may be more cost effective.

**Options Are Available  
To Meet Needs**

ADOT has several management options available to meet the transportation needs of its staff after eliminating the underutilized vehicles.

1. Pooling vehicles at the work sites. As noted previously, many vehicles are assigned to individuals, and are often idle for major portions of the day. (An average of 35 percent of the vehicles at the construction orgs we observed were available at any one time for use by other staff.) Pooling vehicles would be a major means of using vehicles more efficiently while meeting the needs of the staff.
2. Reassigning vehicles within the Department. Even if excess vehicles were eliminated, our analysis is conservative enough to provide ADOT sufficient flexibility in assigning vehicles to critical users. To do so, however, would require reassignment of vehicles across organizational boundaries with adjustments as needs change.

3. Use of ADOT motor pool and DOA motor pool. Some of ADOT's transportation needs may be appropriately filled by increased use of central motor pools. As of March 1987, ADOT had 108 vehicles in its motor pool. Many of these vehicles are themselves underutilized. For example, 13 ADOT motor pool vehicles were driven less than 500 miles per month between April 1986 and March 1987. Similarly, according to a DOA motor pool official, the DOA motor pool has 174 vehicles available for use by State agencies – including ADOT if necessary.
4. Encouraging use of other forms of transportation. ADOT could encourage employees to use personal vehicles and public transportation. If a vehicle is driven fewer than 500 miles per month, it is less expensive for the State to pay mileage for use of personal vehicles than to pay for the costs of purchasing, maintaining and operating a vehicle.

**ADOT Has Taken Insufficient  
Action To Control Fleet Size**

ADOT has not taken adequate steps to ensure control over its vehicle fleet size. Our 1983 audit of utilization found that ADOT was not adequately controlling its fleet. Since then ADOT did reduce portions of its fleet, but it has not established ongoing management reporting and control over utilization.

**Previous audit noted problems** – Our 1983 audit of equipment utilization noted problems with ADOT's ability to control its fleet size. At the time of the audit, 43 percent of ADOT's automobiles and light pickups were not accumulating 1,000 miles per month. The audit identified an estimated 29 to 44 automobiles and light trucks

that should not be replaced. Our audit included the following recommendations to increase ADOT's control over its fleet size.

- ADOT should develop utilization standards and disseminate them to equipment users.
- The Equipment Section should review and evaluate equipment needs, and authorization should be given to the assistant state engineer, Equipment Section, to recall or transfer any equipment that is underutilized or not justified.
- The Equipment Section should develop a monthly report that identifies equipment not meeting the utilization standard
- ADOT's rate structure should be changed to charge each user for the full fixed costs of vehicles in addition to operating costs.
- The Equipment Section should reduce its rolling stock by transferring or eliminating unnecessary equipment, and planned purchases of vehicles should be reduced by transferring underutilized vehicles to replace vehicles scheduled for disposal.

In its response to our 1983 report, ADOT indicated that it would remove 100 vehicles from its fleet, and not purchase the 120 cars and pickups planned. Further, Department officials indicated that the Equipment Management System under development at the time of the audit would assist in controlling fleet size by: tracking equipment utilization; providing utilization analysis reports, fleet size analysis reports, utilization exception reports of below standard usage, downtime reports, and availability reports; setting utilization standards; and tracking equipment usage by operator.

**Inadequate Implementation of Needed Changes** - ADOT has not taken adequate steps to implement recommendations of our previous audit report. In response to our 1983 audit, ADOT reduced the number of heavy equipment units in its fleet, and reduced the number of planned purchases of cars and pickups. However, it has not taken sufficient action to control its passenger fleet. Although we recommended that ADOT monitor utilization, ADOT has not yet developed a utilization standard, and the Equipment Services official responsible for monitoring utilization has indicated that he does not routinely review vehicle usage. Further, although

Equipment Services has responsibility for overseeing utilization, ADOT did not provide clear authorization to the Equipment Services Administrator to recall or transfer any equipment that was underutilized or not justified. The administrator of Equipment Services indicated that he tried to work with users to reduce underutilization, but was unsuccessful. As a result, underutilization may have increased over the past few years. Between 1982 and March 1987, the number of automobiles and light pickups in ADOT's fleet increased from 1,119 to 1,265. The percentage of low use vehicles has also increased. In the 1983 audit we found that 43 percent of the vehicles were driven less than 1,000 miles per month. Now the proportion of vehicles with less than 1,000 miles per month has increased to 48 percent.

### RECOMMENDATIONS

1. ADOT should reduce its fleet of light duty vehicles by approximately 195 vehicles. ADOT should submit a written plan and timetable to the legislature.
2. To improve efficiency of use, ADOT should: a) require construction orgs to pool vehicles rather than assigning vehicles to individuals, b) reassign vehicles within the Department to fill critical needs, c) make greater use of the ADOT motor pool vehicles, and d) encourage use of other forms of transportation.
3. ADOT should develop utilization standards and use the equipment management system to monitor vehicle utilization.
4. ADOT should clarify who has authority to monitor and control utilization, including the authority to remove or reassign vehicles that do not meet utilization criteria.

## FINDING II

### ADOT HAS ALLOWED \$1 MILLION WORTH OF NEW EQUIPMENT TO SIT IDLE TOO LONG BEFORE PLACING IT INTO SERVICE; INDIVIDUAL UNITS HAVE BEEN DELAYED FROM SIX MONTHS TO TWO AND ONE-HALF YEARS

Approximately \$1 million worth of newly purchased equipment has remained unused for six to 30 months before being placed into service. These delays have resulted in waste of State funds, as well as lost user productivity. Poor management and planning appear to be the cause of the excessive delays.

A major responsibility of ADOT's Equipment Services Section is to prepare and issue new equipment to all ADOT users. Equipment preparation ranges from minimal (applying ADOT decals and lights to passenger cars) to more major effort (attaching specialized bodies and other equipment to truck chassis). ADOT mechanics complete a large portion of the specialized work, but the Department frequently contracts with vendors for fabrication and attachment of the special bodies and equipment. All vehicles included in our review required fabrication and attachment of specialized equipment.

Even with special fabrication needs, other organizations have recognized the importance of issuing new equipment promptly and have set target goals for completing new equipment preparation. For example, the City of Phoenix's Equipment Management Section considers delays beyond one and one-half to three months to be unacceptable. Salt River Project's goal is to issue all new equipment in two weeks, because it requires the vendor to fabricate and attach all specialized equipment prior to delivery.

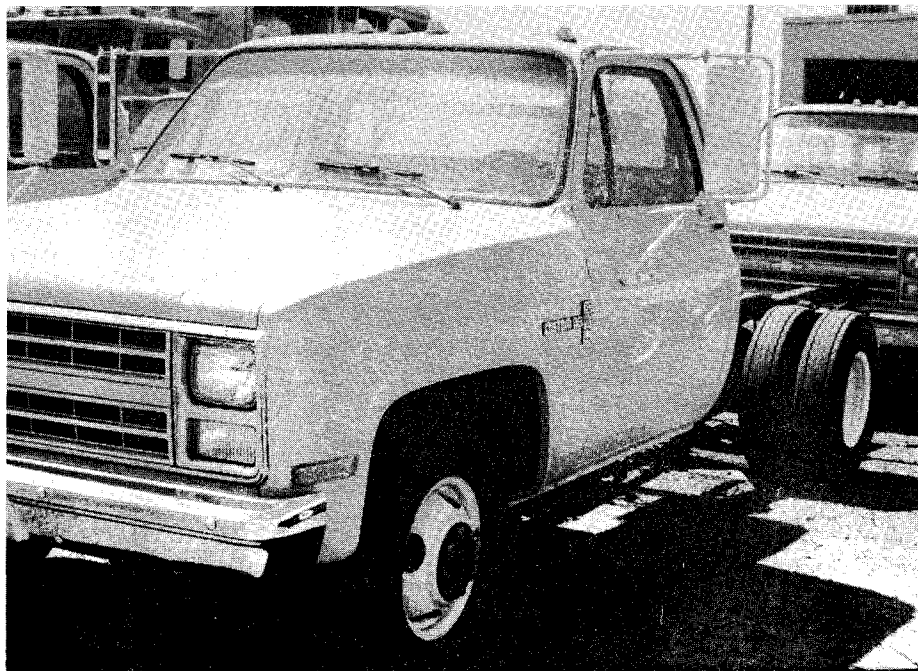
#### Excessive Delays In Issuing Some Equipment

Although other fleet operations attempt to issue all new equipment within three months of receipt, at least 92 ADOT vehicles purchased since 1984 have remained unused for six months or longer before being placed into service. Some of these vehicles, purchased as early as July 1985, are still in the Equipment Services parking lot, while others now in service sat as long as two and a half years before they were put into service.

The following case examples illustrate the delays.

- In August 1984, ADOT accepted delivery of several 1-ton truck chassis, to which special beds were to be added. Five of these chassis, costing a total of \$48,000 at purchase, were not issued to users until January 1987.
- In July and August 1985 ADOT accepted delivery of at least 29 1-ton truck chassis, for a total purchase price of almost \$323,000. As of June 24, 1987, 11 of these chassis were still on the Equipment Services' lot awaiting the fabrication and attachment of special bodies. Another 12 were issued to users between December 1986 and April 1987.

FIGURE 2



One of the 1985 1-ton chassis, still at Equipment Services  
as of June 24, 1987



- In September 1986 ADOT accepted delivery of nine 3/4-ton crew cab pickup trucks worth more than \$106,000, to which special bodies were to be attached. As of June 24, 1987, all nine were still on Equipment Services' lot. Recently, Equipment Services ordered five more crew cabs at an additional cost of nearly \$60,000, yet the original nine still are not in service.

FIGURE 3



A 1986 crewcab pickup, still awaiting special body work as of June 24, 1987

Although these examples illustrate the extreme delays, numerous other vehicles were also delayed excessively. Table 3 shows the results of an Auditor General review of new equipment issuance delays.

**TABLE 3**  
**SUMMARY OF EQUIPMENT ISSUES DELAYED SIX MONTHS OR LONGER**  
**SINCE 1984<sup>(a)</sup>**

	<u>6 Mo. To Less Than One Year</u>	<u>1 Year To Less Than 18 Months</u>	<u>18 Mo. to Less Than 2 Years</u>	<u>2 Years Or More</u>
New Vehicles still on ES lot <sup>(b)</sup>	13	14	11	0
Vehicles Already in Service	31	12	6	5
<b>TOTALS</b>	<b>44</b>	<b>26</b>	<b>17</b>	<b>5</b>

(a) The vehicles listed in Table 4 are only those with delays of six months or longer since 1984. The table represents only trucks weighing 1 ton or less, and does not include such heavy equipment as snowplows.

(b) As of June 24, 1987.

As shown in Table 3, 38 vehicles have been delayed from 6 to more than 23 months and are still awaiting placement into service. Furthermore, excessive delays have occurred at least since 1984. Fifty-four pieces of equipment currently in service were delayed six months or more before they were available to users. Five of these, purchased in 1984, were delayed approximately two and a half years.

**Excessive Delays Have Resulted  
In Waste Of State Funds**

Equipment Services' failure to issue equipment in a timely manner has resulted in wasted State funds as well as problems for some users. Some vehicles were purchased that were not needed, and the delays in their issuance caused still further waste. In addition, some users whose vehicles were scheduled to be replaced by equipment yet to be issued have likely experienced losses in productivity due to excessive breakdown of their old equipment.

**Unnecessary purchases** – Equipment that was delayed one year or longer may have been unnecessary. Equipment Services was responsible for delays of one year or longer on 31 of the 92 vehicles, worth more than \$327,000 at purchase. Such extensive delays lead us to question the need for these vehicles, at least at the time the purchases were made. Furthermore, at least two of the vehicles sitting at Equipment Services' lot were purchased to replace vehicles that have such low utilization (see Finding I) that replacement is not necessary.

We identified additional waste resulting from excessive delays.

- **Possible damage** – According to an expert mechanic, new vehicles that sit unused for extended periods may become damaged. The mechanic stated that all vehicles which have sat unused for one year or more will need new batteries, and all those sitting for four months or more should have their batteries checked. The tires may also have developed a permanent flat spot. Also, any fuel remaining in the vehicles may have dried, leaving a residual varnish. As a result, the vehicles might need a fuel pump replacement or a carburetor overhaul to remove this residue.

- **Elapsed warranty time** - Five of the 92 vehicles we identified had expired warranties while parked at Equipment Services. Numerous others have lost substantial portions of their warranties.
- **Decreased useful life** - Because of Equipment Services' replacement practices, these delayed units may have lost up to two and one-half years of their useful life. An Equipment Services official stated that equipment is replaced based on a specific age or mileage, whichever comes first. Unless ADOT monitors which vehicles were delayed in being placed into service, these vehicles could be prematurely replaced by as much as two and one-half years.
- **Lost interest earnings** - A total of \$90,000 in interest earnings has been lost since 1984 because of unnecessary delays on the part of Equipment Services. This amount could have been earned through normal Equipment Revolving Fund investments if ADOT had delayed purchasing trucks until proper preparation had been made.

**User losses** -On the other hand, at least one user has experienced unnecessary productivity losses because he has had to continue using an old truck that was scheduled for replacement two years ago. A sign truck <sup>(1)</sup> broke down 13 times for a total of at least 56 days during the period of May 1986 through April 1987. This truck was scheduled to be replaced two years ago by a 1985 vehicle that has been sitting idle and unfinished in Equipment Services lot.

#### **Equipment Services Has Mismanaged New Equipment Preparation**

Poor management and planning appear to have caused the excessive delays in issuing new equipment. The Equipment Services Section apparently purchased more equipment than it could timely prepare and issue. Had management been monitoring new equipment delays, this would have become evident. Equipment Services also needs to plan more effectively for new equipment preparation.

Equipment Services personnel stated that more equipment had been received than staff could reasonably handle. According to Section officials, staff have been overworked purchasing and preparing new equipment.

---

(1) Sign trucks are specially equipped to carry and put up road signs, including signs that alert motorists of accident sites.

However, management could have become aware of the heavy workload through monitoring. Equipment Services does not monitor new equipment from the time a chassis is purchased until the finished unit is issued. In many cases, vehicles appear to have been "lost" in the system. Several Equipment Services officials were apparently unaware of the extent of equipment delays. In fact, Section staff completed body specifications for five 1985 and 20 1986 vehicles after our auditors questioned Equipment Services regarding the delays. Had management been monitoring its new equipment, it could have been aware of the problem.

Finally, poor planning contributed to the excessive delays. Equipment Services waited to complete the specifications for the chassis' specialized bodies until after the chassis were received. Had the specifications been completed prior to receipt of the chassis, the vendors could have been selected and ready for the chassis by the time they were delivered to Equipment Services. Preparing body specifications prior to chassis delivery is a common practice among other large equipment fleet managers we contacted.

### RECOMMENDATIONS

Equipment Services should eliminate all unnecessary delays in issuing new equipment to users.

1. Management should:
  - a. Purchase only as much equipment as it can handle in a reasonable time.
  - b. Ensure that all new equipment is monitored through the preparation process, from the time it is ordered to the time it is issued to ADOT users. Through monitoring, Equipment Services should determine whether and how delay time can be reduced.

2. Equipment Services should follow proper procedures in planning for new equipment issuance, such as completing body specifications, issuing bids, and selecting vendors to complete equipment additions before the chassis are received.
3. Equipment Services should monitor the delayed equipment for appropriate replacement timing, to avoid replacing it before its useful life has elapsed.

### FINDING III

#### ADOT COULD REDUCE EQUIPMENT DOWNTIME AND SPEED REPAIR OF EQUIPMENT THAT IS CRITICAL TO USERS.

ADOT could increase the availability of critical highway maintenance equipment maintained and repaired by the central shop. Critical equipment experiences excessive downtime, which impairs user operations and increases costs. Downtime could be reduced by improving repair shop policies and practices that contribute to repair delays.

Minimizing unnecessary equipment downtime is important. It would enable users to perform work as scheduled, without borrowing or renting equipment at extra cost. It would also enable ADOT to benefit from its capital investment in equipment by maximizing equipment availability and minimizing the number of spare equipment pieces needed.

We looked at critical highway maintenance equipment serviced by the central repair shop<sup>(1)</sup> because this shop is responsible for servicing the most vehicles and it has unique duties, which make repair management and scheduling inherently more complex. Citing safety and operational priorities, maintenance foremen we interviewed identified 70 pieces of critical equipment out of the 146 pieces assigned to them. For example, Road Maintenance foremen consistently identified loaders as important because they are needed for many activities their crews might be engaged in. Equipment for traffic control (e.g., lane closures) is also considered critical because work cannot be done safely on the highway without such equipment. Other critical equipment mostly included dump trucks, graders and other larger equipment, as opposed to the passenger vehicles and light pickups discussed in previous findings.

---

(1) Central repair shop serves District 1, covering the Phoenix metropolitan area, and District 5, statewide signing and striping.

## Critical Equipment Is Down Excessively, Impeding User Operations And Increasing Costs

Excessive downtime for some critical equipment may have negatively affected user operations and increased costs. Our review of equipment repairs from May 1, 1986, through April 30, 1987, showed that some equipment may have experienced excessive downtime.<sup>(1)</sup> In extreme cases, six pieces of equipment were out of service for more than 100 working days, and records showed that for one piece of equipment, downtime exceeded 200 days.

Total downtime for all 70 pieces of critical equipment was 15.6 percent.<sup>(2)</sup> Although the Equipment Services Administrator asserts that availability of 75 to 85 percent (equivalent of 15 to 25 percent downtime) for heavy equipment is "not undesirable", such performance is poor compared with standards and performance of other shops.

- Luke Air Force Base - Luke Air Force Base, which has several types of equipment, including heavy equipment, has an availability standard of 90 percent.
- New York DOT - The New York Department of Transportation has an availability goal of 93 per cent for 37 types of equipment considered critical to operations. Of the 37 equipment types, at least 29 (78 percent) are considered heavy equipment.<sup>(3)</sup> Yet, New York has been able to achieve close to 90 percent availability for this equipment. Although New York's performance far exceeds that of Equipment Services, a review of New York's operations concluded that further improvements could enable them to achieve 95 percent availability.

---

(1) This review is based on manual records. We were unable to utilize repair information generated by Equipment Services' computer information system because we identified significant inaccuracy in the way it calculates downtime.

(2) Because repair record format was not easily conducive to even manual downtime tracking, equipment could have been available to users at times when repair records were left open. To the extent this occurred, our review overestimates downtime. However, estimates were conservative in other respects. a) We did not include downtime incurred transporting equipment between user and shop. Travel time for remote users is an hour or more per trip. b) Some users perform some repairs commercially or on their own. Such downtime is not always reflected in Equipment Services records. c) Where we only had data on repair in and out dates, rather than actual clock times, we used the most conservative in and out times possible. This method may have underestimated downtime by as much as two days per repair instance.

(3) Fifty-five of the 70 pieces (79 percent) of ADOT equipment we reviewed were heavy equipment.



- **Salt River Project (SRP)** – An SRP shop we visited reported 89.3 to 98.4 per cent availability for nine pieces of equipment with the most downtime in the heavy equipment classes for the month of May 1987. By comparison, 35 of 70 (50 percent) pieces of ADOT equipment reviewed had availability of less than 90 percent.

ADOT's performance is 5.6 percent below even a 90 percent availability standard. Excessive downtime can negatively impact user effectiveness and efficiency. For example, it can force users to do without a needed piece of equipment, possibly preventing them from performing some highway maintenance tasks. Additional costs resulting from excess downtime may also be incurred by users. For example, it could cause ADOT to maintain more equipment than would be otherwise necessary to substitute for those items being repaired. Or, it may force ADOT to rent equipment. For example, one user who has experienced significant downtime with his dump trucks has had to rent three trucks continuously, at a total cost of \$17,550 as of April 29, 1987.

**ADOT Could Improve Fleet Availability By  
Improving Shop Procedures and Management Policies**

ADOT could reduce downtime by improving shop procedures and management policies. In identifying the possible causes of unnecessary downtime, we noted several changes in shop procedures that would improve repair turnaround time, including improvements in repair scheduling and equipment tracking. Other changes that could improve downtime require management intervention, and include taking action to relieve heavy shop workload, making modifications in shop work hours, improving the availability of parts for repairs, and evaluating refurbishing decisions.

Our records review showed numerous delays occurring prior to and after repairs were initiated. The great majority (59 percent) of reported delays occurred because labor was unavailable. Some repairs experienced multiple delays. For example, a striper came in on September 11 and the repairs were not completed until November 18, 1986 because of labor delays totaling 46 working days. Personnel in the shop responsible for repairing the striper confirmed that they were continually pulled off one job to begin another.

Improve repair scheduling - Delays could be reduced by improving repair scheduling. Unlike other fleet operations, Equipment Services does not estimate repair completion times on its repair forms. According to one authority, the use of estimated completion times could be expected to increase shop productivity by 10 percent. Because the shop does not use estimated completion times, Equipment Services may not only experience decreased productivity, but users may also have difficulty scheduling work because they cannot predict when equipment will be available. In addition, the shop cannot identify what repairs take longer than they should or the reasons for the additional repair time. By comparison, Luke Air Force Base's fleet operation uses a flat rate manual or has its experienced mechanics estimate completion times. SRP also uses estimated completion times.

Need for better equipment tracking--Downtime could also be reduced by better equipment tracking. In some instances, central shop appeared unable to determine the location or status of equipment. One user stated that he was recently told by the shop on two separate occasions that equipment was ready to be picked up, but when the user arrived to pick it up, he was told the vehicle was not ready. Our review also showed delays when equipment goes from one specialty shop to another. For example, records show that one dump truck apparently left a shop on August 28, 1986, but did not go into the next specialty shop until September 4, 1986. The truck apparently remained in the possession of Equipment Services between August 28 and September 4, because the mileage shown on repair records did not change between those dates. The district equipment manager was unable to explain the apparent discrepancy.

In contrast, other shops we visited could instantly determine the status of equipment within the shop. The City of Phoenix shop tracks its equipment by computer, and takes a physical inventory of its equipment daily. Luke Air Force Base and SRP use control boards to monitor equipment going through the shop. SRP characterized its control board function as "critical" to shop operations and Luke Air Force Base described its control board as the "heart" of its operation. Yet, only one of the three Equipment Services shop supervisors currently uses any method that allows the instant tracking of equipment. In addition, Equipment Services has no single person who keeps track of equipment going from shops under the jurisdiction of one shop supervisor to another. It appears that these may be the conditions under which equipment or work orders seem to get "lost."

**Open shop during user off hours** – Equipment availability could also be increased by operating the shop during user off-hours. ADOT's shop is usually open during ADOT's regular work hours, and not at night or on weekends. When equipment is being repaired, users must find alternative ways of accomplishing tasks, such as renting or borrowing replacement equipment or accomplishing work using less effective means. In contrast, repairs minimally affect scheduling for City of Phoenix and SRP users because Phoenix' central repair shop is open 365 days a year, 24 hours a day, and SRP's is open seven days a week, 16 hours a day. Keeping repair shops open during off-hours allows these operations to complete many minor repairs overnight, resulting in minimal interference with user operations.

The Equipment Services' administrator has been reluctant to initiate evening or weekend repairs. He believes such work hours would only be appropriate for repairs taking one day or less. However, our review showed that more than 40 percent of repairs for the critical equipment took less than eight hours, which appears to justify off-hour shifts. The administrator is also reluctant to have evening shifts because it would require additional supervision and added hours for the parts room. However, evening shifts are far more beneficial to equipment users. One way private industry (e.g., utility and telephone companies) operates at more efficient levels is to schedule all repair work at night, which maximizes the the number of vehicles and other equipment available for operations during the day.

**Contract out excess workload** - Unnecessary downtime could be decreased by relieving excess workload. ADOT documents show that in the one year period prior to April 1986, the number of vehicles serviced by central shop increased by more than 50 percent. According to an ADOT official, a significant portion of the increase has resulted from Equipment Services' efforts to update ADOT's fleet (see page 4). However, other shops we visited have ways to handle repairs during peak workload periods. For example, the City of Phoenix advocates contracting out repairs during peak periods to meet fleet availability needs, and SRP has specific criteria under which equipment repairs are contracted out.

**Improve parts availability** - Downtime could also be decreased by improving parts availability. Delays occur because parts are out of stock, which necessitates a mechanic or other staff spending added time getting the part or ordering the part if it is not readily available. Mechanics may also be moved from one job to another as they wait for parts to come in. According to an ADOT official, since delays may involve commonly used parts, repairs may be unnecessarily delayed as a result.

According to ADOT officials and Purchasing representatives, parts delays may be decreased by increasing use of parts contracts, setting adequate parts reorder points, and hiring additional parts personnel. In particular, setting parts reorder points so parts arrive long before stock is depleted could help decrease parts delays. Even with adequate reorder points, however, ADOT officials state that parts delays would continue to occur because ADOT lacks sufficient staff to assign parts numbers needed before reorder points can be set.

Evaluate Refurbishing Decisions - Downtime could also be decreased if management reviewed its decision-making on refurbishing.<sup>(1)</sup> Refurbishing affects the shop's ability to schedule because it is unpredictable and such jobs take at least two to four weeks to complete, potentially interfering with repair tasks. For example, one backup snowplow to be refurbished came in for seven repair tasks. Before the job was done, shop personnel had found 13 additional needed repairs. At the time of auditor observation, the shop had been working on the snowplow for more than a month and was still not finished. SRP recognizes the impact of refurbishing on repair scheduling. SRP's Transportation Services Manager asserted that it is "impossible" to schedule refurbishing without disrupting repair operations. As a result, SRP contracts out all refurbishing. Other shops also seem to do less refurbishing than Equipment Services.<sup>(2)</sup>

---

(1) Refurbishing is the renovation or conversion of older equipment (turned in by users) for low usage functions.

(2) Equipment Services may be more likely to refurbish equipment because it does not consider the cost-effectiveness when deciding whether to refurbish. Other shops we visited consider economic feasibility when making such decisions. For example, the City of Phoenix fleet manager suggested against refurbishing unless it could result in a subsequent life equal to a specific percentage of original equipment life.

## RECOMMENDATIONS

1. Equipment Services should modify its shop procedures to decrease repair turnaround time and increase equipment availability to users by:
  - a. Monitoring its workload and contracting out repairs when workload exceeds that which can be completed by the shop within a reasonable time.
  - b. Establishing evening or night shifts which would allow the shop to complete repairs during user off-hours.
  - c. Estimating a completion time on repair orders, and conducting follow-up if the estimated time of completion is not met.
  - d. Establishing a system that would allow the shop to instantly identify the status and location of equipment in for repairs.
  - e. Improving the parts reorder formula to ensure parts are available when needed.
  - f. Using additional parts contracts and consider assigning additional personnel to assist the parts manager in assigning parts numbers.
  - g. Reevaluating the refurbishing policy, improving its evaluation procedures for equipment being considered for refurbishing, and considering contracting out refurbishing.

## OTHER PERTINENT INFORMATION

Other pertinent information was developed regarding the Equipment Management System (EMS).

Central data management of the Equipment Services Section is performed through the Equipment Management System. However, the EMS system has several shortcomings that severely limit its usefulness to both management and users. These shortcomings were identified by Arthur Young, consultant to ADOT's Productivity Resource Management System (PRMS), and by Auditor General staff in the course of our audit.

Arthur Young, under contract with PRMS, found that reports were inaccurate due to errors made by data input personnel. Error rates invalidated several report printouts because persons providing and inputting the data had not been sufficiently trained. As a result, data has been of limited usefulness to users. For example, in our own study of downtime, we found that both the equipment services administrator and the fleet maintenance manager had concerns with the quality of downtime reports.

Usefulness of reports is limited not only because of inaccurate data but because of a less than satisfactory program. Equipment Services adapted a standard program, Prototype, for use as its management information system. However, Prototype was designed to support a single location maintenance shop whose primary objective is maintenance of a fleet of sedans and small trucks. It was not designed to support a large, multilocation fleet with the many diverse pieces of equipment that ADOT owns. Although the system was modified by the vendor, deficiencies are still evident. For example, PRMS concluded that because of poor data input training and a less than satisfactory program, downtime figures generated by EMS are faulty as well as misleading. As noted in Finding III, we were unable to use EMS downtime data to conduct our analysis.

Reports are not only inaccurate, but they are cumbersome for management to use because they are long and unnecessarily detailed. Much of the data are provided in a format that requires a manager to look through detailed listings to locate desired information. In part, this occurs because exception reports require standards to be established in the system. However, because many standards have not been established, some reports identify everything as an exception. For example, one exception report is more than 200 pages long. Yet, this report is only one of 139 reports routinely generated by the EMS. By contrast, West Virginia's Equipment Management System provides comprehensive management information in a summary report which is a single page long. According to a former user, the system can provide any level of detail a user might need to evaluate performance.



## AREAS FOR FURTHER AUDIT WORK

During the course of our audit we identified a potential issue that we were unable to pursue due to time constraints.

- Should ADOT contract out portions of the equipment management function?

Several concerns lead us to question whether at least portions of ADOT's equipment management could be handled more efficiently and effectively by private contractors.

- (1) Currently, ADOT does much of the fabricating and attaching of specialized equipment to its heavy and light duty trucks. Yet, both Salt River Project and the City of Phoenix contract out nearly all of this work. Contracting out new equipment preparation has enabled both of these other shops to issue their new equipment in a relatively short time, while leaving repair shop personnel free to conduct actual equipment repairs.
- (2) ADOT's Equipment Services Section also refurbishes selected old equipment to save much of the cost of purchasing expensive new equipment. However, refurbishing takes a great deal of mechanical labor and interferes with regular equipment repairs. In contrast, the City of Phoenix currently does not refurbish equipment, and SRP contracts out all its refurbishing.
- (3) Equipment Services also appears to be experiencing numerous repair delays because it has to wait for parts. In Finding III, we recommend increasing parts contracts and adding personnel to expedite parts. However, at least one other large fleet operation, Luke Air Force Base, obtains some parts through a private parts store on contract with the Base.

Further audit work is needed to determine whether it would be more cost-effective to contract out these and other functions.



# ARIZONA DEPARTMENT OF TRANSPORTATION

206 South Seventeenth Avenue Phoenix, Arizona 85007

September 30, 1987

EVAN MECHAM  
Governor

CHARLES L. MILLER  
Director

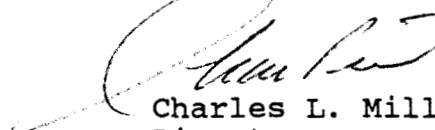
Mr. Douglas R. Norton  
Auditor General  
2700 North Central Avenue, Suite 700  
Phoenix, Arizona 85004

Dear Doug:

Thank you for the opportunity to review the revised preliminary report of the performance audit of the Arizona Department of Transportation, Equipment Section. Our comments concerning the findings are attached.

Again, thanks for this opportunity to comment and for the cooperation extended by you and your staff.

Sincerely,



Charles L. Miller  
Director

CLM:VN  
Attachment



FINDING I: APPROXIMATELY 195 CARS AND TRUCKS COULD BE ELIMINATED FROM ITS FLEET IF ADOT IMPROVED EFFICIENCY AND DID NOT REPLACE UNDERUTILIZED VEHICLES.

ADOT POSITION: PARTIALLY CONCUR

While we agree the ADOT fleet size can be reduced, we do not agree with the audit criteria developed by the Auditor General's Office for vehicle usage. Vehicles are one of the tools necessary to provide adequate quality control on highway construction projects. The State Engineer has established an FTE/vehicle ratio of 0.75, based on an analysis of required staffing for construction projects. On the basis of this review, ADOT will remove a minimum of 138 units from the fleet by December 1, 1987.

We do not concur with the Auditor General's comments that no action was taken following the 1983 audit's recommendations. Over \$5,400,000 in trucks, graders, and dozers were removed from ADOT's fleet between July 1984 and July 1987. In addition planned purchases of sedans and pickups scheduled for 1983 were substantially deferred. The recommendations concerning the reduction of passenger cars and pickups were reviewed after increased funding for construction was realized during this same period. On the basis of that review and the pending increase in the construction program, the vehicles identified for removal from the fleet were not removed. It was determined that these vehicles were necessary in order to staff the increase in construction personnel.

Since FY 1983 the construction program has increased from \$85 million in contractor payments to \$305 million in contractor payments. Construction FTEs have increased from 529 to 609, short of the anticipated high of 690. Through the use of innovations such as contractor staking, end product asphaltic concrete projects, the use of consultants for contract management, and increased quality control responsibility by the contractor, we did not reach the anticipated 690 FTE level and are now prepared to reduce our construction vehicle fleet accordingly.

It should be noted that mechanisms have been implemented to adjust vehicles as the construction program fluctuates over the next several years.

RESPONSE TO FINDING I'S RECOMMENDATIONS:

1. In addition to removing 138 units from the fleet, ADOT will continue to monitor and control utilization of the fleet. Beginning immediately and continuing on a semi-annual basis beginning January 1, 1988, a summary report, showing additional reductions or increases to the fleet based on program needs, will be furnished to the State Engineer and Director.

2. ADOT will require, where appropriate, construction orgs to pool vehicles; will reassign vehicles to fill critical needs; will make greater use of the Motor Pool vehicles; and will encourage the use of other forms of transportation.
3. ADOT has utilization standards, and a management utilization exception report will be issued quarterly to all managers, beginning October 1, 1987.
4. The State Engineer, beginning immediately, will review and establish utilization criteria. Based on that criteria, the Equipment Services Administrator will have the authority to remove and reassign vehicles.

FINDING II: ADOT HAS ALLOWED \$1 MILLION WORTH OF NEW EQUIPMENT TO SIT IDLE TOO LONG BEFORE PLACING IT INTO SERVICE; INDIVIDUAL UNITS HAVE BEEN DELAYED FROM SIX MONTHS TO TWO AND ONE-HALF YEARS.

ADOT POSITION: CONCUR

ADOT has not placed certain items of equipment into service as expeditiously as desired. However, it is significant to note that over 1,700 pieces of equipment, valued at over \$15 million, were processed between July 1984 and July 1987. Over 44% of the fleet now are 1984s or newer.

As a general policy ADOT fully expects new equipment (depending on type, complexity, and priority level) to be issued in a timely fashion (within one to three months from receipt).

RESPONSE TO FINDING II'S RECOMMENDATIONS:

- 1a. Two additional employees have been added to the "get ready" equipment function to allow processing of more equipment. New procedures are being instituted to provide a smoother flow through the preparation process. Even with these improvements manufacturers' deliveries cannot be controlled by ADOT, and it is possible that system overloads may reoccur.
- 1b. All new equipment is monitored; however, with the addition of staff the status of each unit now will be examined more closely on a regular basis. Any required corrective action will be taken immediately.
2. There will be additional emphasis on planning, and body requisitions will be issued well before receipt of any chassis. A new procedure based on an "Equipment Acquisition Planning Work Sheet" will be used. This work sheet will detail all acquisition activities, showing target and actual dates, the

office of primary responsibility for each activity, and contractors, and will document all changes and factors necessitating these changes.

3. Equipment Services will monitor currently delayed equipment for appropriate replacement timing to assure no equipment is replaced prior to the lapse of its useful life.

FINDING III: ADOT COULD REDUCE EQUIPMENT DOWNTIME AND SPEED REPAIR OF EQUIPMENT CRITICAL TO USERS.

ADOT POSITION: CONCUR

RESPONSE TO FINDING III'S RECOMMENDATIONS:

- 1a. Procedures are being developed to monitor the workload and to assure completion within a reasonable time. These procedures will be completed by March 1, 1988.
- 1b. Additional study, budgeting and resources are required before implementation of this recommendation. The study will be completed and final recommendations made by March 1, 1988.
- 1c. This recommendation will be implemented by January 1, 1988.
- 1d. This recommendation will be implemented by January 1, 1988.
- 1e. Employees are being hired to implement this recommendation by January 1, 1988.
- 1f. Establishing parts contracts is an on-going operation. By November 1, 1987 an additional employee will be hired to assist in assigning parts numbers.
- 1g. All refurbishing decisions are evaluated by the Equipment Services Administrator. Very few refurbishing projects are now being undertaken; however, ADOT will review its current policy in order to assure any appropriate refurbishing is accomplished in a manner least disruptive to shop repair operations.