

## **METROPOLITAN DEVELOPMENT AND HOUSING AUTHORITY FLEET MANAGEMENT AND MAINTENANCE**

### **Introduction**

The Metropolitan Development and Housing Authority (MDHA) fleet management and maintenance program (MDHA fleet management and maintenance) currently employs three full time equivalent employees (FTEs). These individuals maintain 135 equipment units. This equipment will be defined later in this report.

Organizationally, MDHA fleet management and maintenance is part of the Maintenance section of the Operations group. The MDHA fleet management and maintenance facility is located close to the MDHA headquarters area. Space is shared with other maintenance groups. The facility is close to users and housing developments as well.

The MDHA fleet management and maintenance group operates at an annual cost of \$239,000. On a fiscal year to date basis, the group is projected to spend less than the budget, which is \$402,000.

### **Executive Summary**

In general, we found the MDHA fleet management and maintenance program to be performing well in many ways. The organization was interested in performing at a high level. Management was responsive to TCI's visit and to any suggestions that we had. Corrective action started immediately following our visit, and many items were completed before report issuance.

The items listed below will be detailed in the body of the report.

#### **More specifically:**

- Based on our observations, maintenance of the fleet was above average. The mechanics were well trained, certified and motivated to perform good service.
- Conditions of use have created a fleet that is old but relatively low in miles.
- The fleet was not being replaced at a normal or planned replacement rate. MDHA has since put a plan in place.
- Good communications existed between MDHA fleet management and maintenance and users. Generally, users were pleased with the service and

respected the maintenance program. Interviews did indicate, however, that users would appreciate the use of a loaner while their vehicle was being serviced.

- Record keeping was incomplete and undisciplined. No meaningful data is being collected.
- Preventative maintenance (PM) is currently scheduled on an interval of 6 months. TCI suggests that this be done every four months.
- MDHA fleet management and maintenance uses the MDHA work order system to process its work orders. While the system is designed for maintenance of housing units, the system could be better utilized to give more information to support the MDHA fleet management and maintenance program.
- There is a need to enhance written policies and procedures in the maintenance operation.
- Fleet management reporting of any type is not in place.
- TCI normally calculates a cost per vehicle to measure efficiency. The cost per unit for MDHA fleet management and maintenance without the inclusion of grounds equipment is \$3,144. TCI would normally expect to see a cost per piece of equipment of approximately \$3,000, which means that MDHA's overall maintenance program is cost effective.
- Staff indicated to us that much of the current parts inventory consists of very slow moving or obsolete items. Parts procurement is now being handled through NAPA. TCI concurs with the decision to reduce inventory and to buy directly against work orders for most parts.
- The current maintenance facility is relatively new and well equipped. TCI has a few suggestions later in this report to effectuate minor enhancements.
- The current budget calls for three mechanics. At present only two are on staff. TCI believes that the operation could function efficiently with the current staff. Outsourcing could be used to handle any unusual peaks or time consuming repairs.
- MDHA currently uses 89-octane level fuel. TCI suggests converting to 87-grade.
- TCI recommends that the MDHA consider taking advantage of certain Metro-wide programs. Examples would include the ongoing, on-line surplus property operation, the purchase card process, and, in the long term, the fuel purchase program.

- MDHA's equipment inventory contains a sewer truck. MDHA should consider removing this from inventory and finding other ways to meet the needs for this equipment.

## **1.1 Overview of MDHA Fleet Management and Maintenance**

As previously mentioned, the MDHA fleet management and maintenance group is located close to their headquarters. This area contains a number of MDHA operations. The maintenance group moved to this site approximately four years ago.

The space used for repair operations consists of 4,500 square feet. The area includes six bays and four overhead doors. MDHA fleet management and maintenance operates five days per week, ending operations at 4:00pm.

The equipment inventory consists of 135 items. Seventy-six of these items are vehicles. The median age for vehicles is 1995. This is quite old for a mixed fleet. The remaining items are primarily grounds equipment, such as riding mowers. The equipment inventory will be discussed more in **Section 1.7, Fleet Assets and Replacement**.

The equipment maintenance shop is currently staffed with two mechanics and a working supervisor. The budget for the current fiscal year calls for an additional mechanic and MDHA management is trying to operate with the existing staff. TCI supports this effort and suggests that out-sourcing be used to handle any peak times or unusual situations.

## **1.2 Management Issues/Policies and Procedures**

TCI found that MDHA fleet management and maintenance keeps their equipment in good working order. In addition, good communications and relationships are maintained with their users.

The staff appears to be well trained and motivated. The shop supervisor is interested in improving operations and reacted promptly to suggestions. However, certain key components of a solid, well-functioning organization are not in place. These components fall in the areas of record keeping, procedures and reporting. These changes and opportunities are detailed below:

- Fleet policy and procedures are not clearly and consistently documented.

- Management reports are not fully developed or deployed.
- The information system is incomplete and inaccurate.
- Metrics are not routinely employed.
- Work order accuracy and filing is not a high priority.

Below are some recommendations that we will make relative to management issues.

- (1) Current Situation:**                      **Absence of written procedures**
- Finding:**    There is a lack of consistent and complete written policies and procedures.
- Recommendation:**                              Identify the critical areas where procedures are required. Obtain administrative support to help articulate and then write the procedures with input from key staff. Develop a simple book of procedures so that the information is kept in one place and available for all employees.
- Cost Implications:**                              None. Existing staff should be able to document policies and procedures.
- (2) Current Situation:**                      **Lack of maintenance reporting**
- Finding:**    Little MDHA fleet management and maintenance reporting exists.
- Recommendation:**                              Using the below, management should determine the critical areas for measurement. Support should be given to MDHA maintenance in developing reports and collecting information. The expectations and reports should be shared across the board, including users, staff and appropriate members of MDHA management. Some key measures captured by larger fleet operations include:

**Downtime:**

The number of vehicles, machinery or Equipment **out of service** at a given point in time divided by the number of vehicles in the fleet, expressed in percentage format. A norm for MDHA would be 6-8%.

**Utilization (labor):**

The amount of direct, billable time recorded by service employees compared to the total amount of time available for work expressed in a percentage format. A norm for MDHA would be 75%

**Turn-around Time:**

The elapsed time beginning when a vehicle (or equivalent) is delivered to a maintenance facility for repairs or servicing and ending when the repairs or servicing is completed and the user is notified that repairs are completed (typically expressed as <8 hours; > 24 hours; 24 to 48 hours; and > 48 hours). A norm would be 90% in 48 hours or less.

**Repeats/Come-backs:**

Instances where repairs to vehicles, machinery or equipment were not made in a satisfactory manner, necessitating a second request for repairs for a similar labor code.

**Preventive Maintenance (PM) vs. Corrective Maintenance:**

The ratio of job orders for vehicles, machinery or Equipment that are written for scheduled maintenance as opposed to job orders that are written for corrective or unscheduled repairs, divided by the total repairs and expressed as a percentage. Well run garages have PM ratios that exceed 50%.

**Preventive Maintenance Compliance:**

The percentage of on-time arrivals for scheduled preventive maintenance (PM), expressed as within 3 days or 500 miles of the scheduled maintenance date or mileage interval.

**Cost Per Piece of Equipment:**

Annual department costs divided by the number of vehicles.  
A norm for MDHA would be \$3,000.

**Vehicles per Mechanic:**

Total equipment should be divided by the number of mechanics. A norm for MDHA would be 70 to 1.

In the case of the MDHA maintenance effort, we would suggest starting with the measurements that are easy to obtain and understand. Our suggestions would include cost per equipment item, PM compliance, and a status report that shows equipment out of service and turnaround time.

**1.3 Maintenance Metrics**

As mentioned in the previous section, a key element in responsive fleet management and maintenance is the use of management reports and metrics to measure performance. Over the years, TCI has developed certain metrics and standards that are useful benchmarks. It is useful to track these measures on a historical basis.

Because of lack of accurate information and history and the lack of any reporting within the organization, TCI can only provide very limited feedback on metrics.

The MDHA Equipment inventory contains 135 items. This list is further defined in **Section 1.7, Fleet Assets and Replacement**. The following table uses that equipment count to estimate **mechanic staffing** requirements:

**Table 1: MDHA Fleet Management and Maintenance  
Vehicle/Mechanic Ratios**

<b>Vehicle Type</b>	<b># of Vehicles</b>	<b>Units Per Mechanic</b>	<b>Required Number of Mechanics</b>
Vehicles	76	50	1.5
Grounds Equipment	59	90	.7
<b>Total</b>	<b>135</b>		<b>2.2</b>

Since the shop is staffed by two mechanics, plus a working supervisor, TCI finds that the current budget contains enough resources to properly maintain the existing fleet. Peak periods and unusual requirements can be handled by outsourcing.

The **cost per vehicle** calculation poses difficulty, since the MDHA fleet contains both vehicles and grounds equipment. Accordingly, TCI has calculated a range of results, shown on the table below:

**Table 2: MDHA Fleet Management and Maintenance  
Cost Per Vehicle Calculations**

<b>Category</b>	<b>Budgeted Amount</b>	<b>Actual Amount</b>
<b>Fleet Costs Less Fuel</b>	\$350,000	\$239,000
<b>Number of Vehicles</b>	76	76
<b>Cost Per Unit, Vehicles Only</b>	\$4,600	\$3,144
<b>Total of Vehicles and Grounds Equipment</b>	135	135
<b>Cost per Unit for both Vehicles and Grounds Equipment</b>	\$2,600	\$1,770

In our opinion this range is reasonable from a cost standpoint.

Again, because of the lack of available data, we could not calculate any other metrics.

As previously recommended, TCI strongly recommends that MDHA should begin recording and tracking report data.

#### **1.4 Information System**

Timely and accurate management and maintenance information is an essential ingredient in successful fleet management and maintenance. Today's best fleet management and maintenance information packages provide barcode data entry on a real time basis and allow quick access to both current and historical data that is needed by technicians and management for proper decision-making.

MDHA is employing the system used to process tenant repair requests to track fleet maintenance activity. This makes some sense in the current environment. However, much work needs to be done to make the information useful.

For example, work orders are not fully or correctly filled out, information is not processed in a timely fashion, and there are no procedures in place to insure consistency. In addition, no apparent thought has been given as to how the data should be entered to allow MDHA fleet management to capture and report meaningful information.

As TCI builds the requirements for a Metro-wide system solution, MDHA needs will be considered.

<b>(3) Current Situation:</b>	<b>Work Order Data Not Captured and Reported</b>
<b>Finding:</b>	While some data is being captured, no system approach is in place to allow consistent capture and reporting.
<b>Recommendation:</b>	Assign resources to define data needs and reports. Document a process that will allow management to track progress in the maintenance area. Consider using the Metro-wide fleet management system once it is implemented.
<b>Cost Implications:</b>	None. Resources exist within the organization to accomplish this.

## 1.5 Inventory Management

The parts area in MDHA fleet maintenance is located adjacent to the garage area. Parts are stored on two levels and the square footage totals 900. The space is appropriate for a small parts area.

The parts inventory contains many obsolete items. With a small staff and no dedicated parts person, a parts inventory and ordering process was deemed to be impractical. The staff has converted to a just in time system supported by NAPA.

## 1.6 Financial Information

The annual budget can be separated into major components as follows:

- Labor Related Expenditures .....\$106,000
- Fuel.....52,000
- Outside Repair .....33,000
- Automotive Parts.....100,000

The above represents estimated actual final expenses. As previously mentioned, MDHA fleet maintenance expects to have a positive budget variance.

Some costs normally seen in a fleet maintenance budget are not included in the MDHA budget. Some administrative costs are included in other areas of the Operations Department budget. In addition, building and utility costs are not included.

## 1.7 Fleet Assets and Replacement

TCI reviewed the equipment inventory. Table 3 shows the age of the fleet:

**Table 3: MDHA  
Equipment Aging**

	<b>Equipment Units</b>	<b>Median Age</b>
Grounds Equipment	59	1998
Vehicles	76	1995

The median age for vehicles was 1995. This fleet is older than expected when compared to normal standards. The capital dollars allocated for vehicles over the last several years has averaged \$120,000. TCI is concerned that there is no fleet replacement plan in evidence. For example, if we expect the fleet to be replaced on a seven-year cycle, the median age would be 3.5 years not 6 years. There apparently is very stringent control over replacement vehicles. A good replacement plan will provide guidelines for both age and mileage

MDHA's equipment inventory contains a sewer truck that is seldom used.

**(4) Current Situation: Specialty Trucks**

**Finding:** The fleet contains an under utilized, sewer truck. Repair costs are high, since operators do not use the equipment on a regular basis, and since the vehicles sit idle for days at a time.

**Recommendation:** MDHA should consider finding other ways to meet the needs for this type of equipment. Sub-contracting, renting, or borrowing equipment from other Metro agencies would be cost effective alternatives.

**Cost Implications:** A change in policy would free up capital dollars and reduce repair costs.

**(5) Current Situation: Fleet Replenishment**

**Finding:** The fleet is relatively old. No replacement plan is in place.

**Recommendation:** Fund capital replacements on an annual basis. Appropriate enough funds to replace the equipment over its useful life. Develop an industry standard replacement plan as a guideline. For most vehicles we would recommend 7 years or 100,000 miles which ever comes first.

**Cost Implications:** Not determinable until a replacement plan is in place.

**1.8 Maintenance Operations**

As mentioned, one lead mechanic/ supervisor and two mechanics staff the shop. The lead working mechanic demonstrates adequate knowledge, strives to maintain a clean productive shop, and is well respected by the mechanics.

The lead working mechanic lacks training on the use of computers. PM inspection schedules, parts inventories, and work orders are not computerized partly as a result of this lack of computer training. TCI implemented a simple spreadsheet solution to assist in PM inspection scheduling.

The lead working mechanic **immediately** addressed all exceptions and recommendations resulting from our brief maintenance review.

TCI spent “on the job” time observing each mechanic in their daily routine. Each is exceptionally knowledgeable and demonstrates pride in work quality and productivity.

The mechanics coordinate daily workload requirements well and complement each other’s efforts. Given the fleet size and relatively thin ratios, each mechanic must remain productive to prevent backlogs of repair work.

Maintenance repairs are completed with strong emphasis on quality and prevention. This small shop deserves recognition for achieving high throughput and presenting a strong work ethic. Overall shop performance ranks high.

Shop administrative procedures lack accuracy, discipline, and accountability. On the other hand, while much shop work is completed, the repair order documentation process fails to capture that effort. Relatively little mower and equipment repair is recorded at all. We recommend that all repairs should be properly documented as completed. The lead working mechanic should compare each days repair order totals to paid hours to ensure accuracy. As mentioned elsewhere in this report, there are opportunities to improve the paper trail and systems.

Replacement parts are expensed; “just in time” parts delivery is utilized via the local NAPA parts distributor. TCI understands the rationale and value for this “just in time” service. While NAPA parts are competitive, we recommend that original manufacturers’ replacement parts should be compared in pricing, warranty, and service life. During our visit, we saw evidence of failed warranty parts not being returned for credit.

MDHA currently uses 89-octane level fuel. With modern engines, 89-octane is not needed. Removed vehicle tires were stacked along the fence line outside the shop. Removed tires should be stored inside till retrieved by the scrap tire pick up service. When left outside, they collect water that becomes a prime breeding ground for disease spreading mosquitoes.

Mud flaps on the large sewer vacuum vehicle display the NAPA vendor logo. Reversal of the flaps would avoid advertising vendor products on government vehicles.

The fuel tanks are placed in a location that creates poor traffic flow. Fuel tank venting for the under ground storage tanks is close to the overhead shop doors. Our concern is that gasoline vapors spread into the garage roof area and may be ignited by the overhead fuel fired heaters.

TCI observed three problems with the building. First, there is only one drive through bay. This causes problems in moving and marshalling vehicles for repair. Second, the wash area was not properly completed, limiting its use. Third, a temporary storage building has been placed behind the garage. This complicates access to the garage and limits turning radii. In our wrap up discussion, management assured us that the temporary storage building would be moved shortly.

Preventative maintenance (PM's) is currently scheduled on an interval of 6 months. Vehicle maintenance could be improved by performing this inspection every four months.

- (6) **Current Situation:** **Failure to Complete Work Orders for all Repairs**
- Finding:** Work orders are not being completed on all repairs, especially small equipment.
- Recommendation:** Fully complete work orders on all repairs.
- Cost Implications:** None.
- (7) **Current Situation:** **Lack of Computer Expertise**
- Finding:** Lack of computer training hinders the capture of work order information and the development of reports.
- Recommendation:** Provide a series of computer orientation, Word, and Excel classes.
- Cost Implications:** One or two day classes on Word and Excel are approximately \$75 to \$130 per person.

- (8) Current Situation: Retention of Old Tires**
- Finding:** TCI observed old tires stored outside the garage. This is unsightly and a health hazard.
- Recommendation:** Have old tires removed on a regular basis.
- Cost Implications:** Minor, less than \$1,000 per year.
- (9) Current Situation: Incorrect Placement and Venting of Fuel Tanks**
- Finding:** The gas fueling tanks are located in an area that creates access problems and allows the tanks to vent in such a way that the fumes can be drawn into the garage. This is a safety hazard, since a gas heater is located nearby.
- Recommendation:** Consider utilizing another Metro fueling site, implementing a fuel card program, or moving the tanks. If the tanks stay where they are, the vent pipes need to be raised to provide sufficient clearance.
- Cost Implications:** Unknown – depending on the alternative selected.
- (10) Current Situation: Lack of Drive Through Bays**
- Finding:** The garage only has one drive through bay, although the original building plans called for two.
- Recommendation:** Install the second door per the original plan.
- Cost Implications:** The cost to do this door would be \$10,000 - \$20,000. This would be offset by operating efficiencies over the life of the garage.
- (11) Current Situation: Limited Wash Area**
- Finding:** The wash area was not completed in line with the original building design.
- Recommendation:** Complete the wash area. This will extend the usefulness of the area, especially in the winter months.
- Cost Implications:** This is budgeted for \$10,000

- (12) **Current Situation:** **No Tracking of Parts Under Warranty**
- Finding:** Replacement parts' warranties are not tracked consistently.
- Recommendation:** All replacement batteries, alternators, starters, etc. should be paint pencil marked with warranty expiration dates. This procedure will assist in warranty recovery, as warranty dates will be readily identified for removed parts.
- Cost Implications:** Parts warranty recovery is estimated to be approximately 3 – 4% of the asset value over the life of the asset. The actual savings to MDHA would vary according to the fleet replacement schedule.
- (13) **Current Situation:** **Purchase of 89-octane Fuel**
- Finding:** 87-octane is sufficient for the fleet.
- Recommendation:** Convert to the purchase of 87-octane.
- Cost Implications:** The annual savings would be approximately \$1,800.
- (14) **Current Situation:** **PM Frequency**
- Finding:** PM's are performed every six months.
- Recommendation:** PM's should be scheduled in four-month intervals. This can be accomplished with existing staff, and will provide higher reliability for the MDHA fleet.
- Cost Implications:** An improvement in PM policy of this type should actually reduce maintenance costs over the long run.

## 1.9 User Feedback

Our consultants talked to users within the MDHA. Generally, comments were favorable as to service performed and as to communications. Typical comments praised the shop supervisor and the mechanics. However, no formal process exists (such as quarterly meetings) to collect user feedback.

The need for loaners was mentioned. In most cases, the housing developments only have one vehicle. When it is in the shop, they sometimes choose to use their own vehicle. TCI asked if it was normal to be reimbursed for mileage, if an employee vehicle was being used. The response implied that some people did not want to bother with reimbursement.

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| <b>(15)</b> | <b>Current Situation:</b> | <b>User Communication</b>  |
|             | <b>Finding :</b>          | There is no scheduled or routine process to obtain user feedback.  |
|             | <b>Recommendation:</b>    | Develop a process to obtain feedback from key users. Quarterly user meetings are recommended.  |
|             | <b>Cost Implications:</b> | None   |
| <b>(16)</b> | <b>Current Situation:</b> | <b>Use of Loaners</b>  |
|             | <b>Finding :</b>          | Users are left without a vehicle when one is in the shop. In some cases they use personal vehicles.  |
|             | <b>Recommendation:</b>    | Increase the loaner fleet using some of the older, high mileage, pick up trucks. If personal vehicles are used, ensure that employees receive mileage reimbursement. |
|             | <b>Cost Implications:</b> | Minor. Vehicles can be obtained by retaining some of the older pickup trucks instead of salvaging them.  |