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**PTI/APWA Equipment Management
Information System, Chief
Executive's Report**

Public Technology, Inc, Washington, D C Information Systems Grp

Prepared for

**Department of Housing and Urban Development, Washington, D C Assistant
Secretary for Policy Development and Research**

1977

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PTI/APWA EQUIPMENT MANAGEMENT INFORMATION SYSTEM

CHIEF EXECUTIVE'S REPORT

**U.S. Department of Housing and Urban Development
Office of Policy Development and Research**

PUBLIC TECHNOLOGY, INC., WASHINGTON, D.C. AND SAN JOSE, CA.

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PTI/APWA EQUIPMENT MANAGEMENT
INFORMATION SYSTEM

CHIEF EXECUTIVE'S REPORT

Final Project Report

U. S. Department of Housing and Urban Development
Office of Policy Development and Research
Washington, D. C.

Prepared Under Contract #H-2106R

By

Public Technology, Incorporated
1140 Connecticut Avenue, N. W.
Washington, D. C. 20036

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INTRODUCTION

Using the PTI/APWA* Equipment Management System Package, local administrators and equipment managers can decrease the operating and maintenance costs of motorized equipment--even while maximizing availability through decreased downtime--to improve efficiency.

The computer-based information system is a fully transferable tool for aiding local policy development and management decision making. Effective monitoring and evaluation of motorized equipment management is the ultimate objective of package implementation. Its effectiveness depends upon top management utilization of the reports that are generated.

The package is implemented by a start-up project team composed of top management representatives, fleet officials, and support staff members. The system output provides an objective basis for local administrators and equipment managers to reach a common understanding on equipment costs, staff levels, and maintenance programs appropriate in each local jurisdiction.

The PTI/APWA Equipment Management Package can be used to obtain detailed information on equipment operating and maintenance characteristics. This meets the long expressed need of local officials and equipment managers for a system

* Financial support to structure and test the package was shared by Public Technology, Inc. (PTI); the Department of Housing and Urban Development (HUD), Office of Policy Development and Research; the American Public Works Association (APWA), Dade County Florida, and the cities of Milwaukee, Wisconsin; and Ft. Lauderdale, Florida.

that keeps the minimum number of vehicles in service the maximum amount of time at minimal cost. The PTI/APWA Equipment Management Package provides information to make decisions based on an objective appraisal of the local situation.

Maintaining detailed records for the vehicles utilized by various organizational units within a jurisdiction is a complex task. Effective management analysis on the present and historical costs of fuel, parts, labor, and commercial costs requires a computerized information system.

The PTI/APWA Equipment Management Package was developed and tested with the help of local officials and equipment managers across the country. The computer programming was performed by local government staff with PTI coordination. Most communities contacted thus far, indicate that the system can help them hold the line on equipment management costs by improving their statistical and cost accounting procedures.

SYSTEM OPERATION

The package is structured around a set of computer programs, worksheets, and forms. Complete documentation is provided to support the project team. Local government personnel collect data which are prepared for use by the system. Forms are generated by the system users and transmitted to the jurisdiction's own data processing facility. The forms include repair orders, fuel usage, and other data necessary for computer operation.

Following data collection, the system modules are used to generate a series of reports. There are six modules in the equipment management system:

- o Equipment Inventory;
- o Fuel;
- o Repair;
- o Preventive Maintenance;
- o Billing; and
- o General.

The basic modules of the system are for Equipment Inventory, Fuel, and Repair. While these three are the minimum to be implemented if the system is to be of any use, the greatest value of system operation is in the sharing of data by each of the modules. The comprehensive reports which result strengthen management analysis.

Most module reports are produced monthly and transmitted to system users. Some reports are generated only when requested. The system also retains information which can be useful for special reports designed according to local needs.

The Equipment Management System also produces reports which pool information from the complete set of modules. These comprehensive reports present a picture of the operating and maintenance costs and characteristics for individual pieces of equipment and classes of equipment. This output is used in support of cost accounting and equipment performance evaluations.

However, the Equipment Management System does not make decisions. Careful interpretation of the computer data summaries listed in Table 1 yield an improved understanding of motorized equipment status. Decision makers themselves develop the management guidance that meets local objectives for service delivery.

PACKAGE IMPLEMENTATION

A locally determined project team should be established to implement the system package as described in the system Implementation Handbook. The system package includes the computer programs, program documentation, and forms, procedures and reports as documented in the User's Guide. The completion instructions for the forms are provided in the Forms Completion Instructions manual.

An appointed Project Leader is the administration representative who assembles a team to implement the package. Because of the coordination requirements involved, someone should be appointed from the executive staff level. In some jurisdictions, the Chief Executive, Department Head, or Fleet Manager may fill this role. Additional members of the project team are drawn from data processing and other relevant departments.

The first step for the project team is to develop a searching attitude toward equipment management. Because of the magnitude of the costs involved, it is clearly in a local government's interest to carefully question the status of current operations. The questions shown in Table 2 are based on the need for objective data to support decisionmaking. When asked by top management, the project team should be able to determine the adequacy of the existing system.

Table 1

INFORMATION BASE FOR DECISION MAKING

- o The quantity and cost of labor, parts, and commercial costs for each equipment repair, with evaluations of repair characteristics and projected trends.
 - o Equipment class performance comparisons and assigned organization performance comparisons.
 - o Repair shops productivity analyses.
 - o Fuel quantity and cost audit trails for equipment and fuel pumps.
 - o A fleet-wide historical comparison of the cost of maintaining the fleet, including operation and maintenance characteristics and costs.
 - o Identification of operating and maintenance problems through exception condition reporting.
 - o An analysis of the frequency and cost impact of each type of repair for each repair shop.
 - o An analysis of the cause of repairs for each class of equipment.
-

Table 2

BASIC EQUIPMENT MANAGEMENT QUESTIONS

- o Is there an excessive amount of equipment out of service?
 - o What controls and audit trails are there on fuel disbursements?
 - o What type of repairs are causing the highest outlays for labor and parts?
 - o Is there an adequate preventive maintenance program for maintaining optimal equipment performance and decreasing equipment downtime?
 - o Do equipment billing rates recover maintenance and operating expenses?
 - o Are certain pieces of equipment being used for purposes which lead to increased maintenance costs and downtime?
-

The second step is to accurately define local needs for an equipment management system. The answers to questions asked during the first step will establish a baseline for management decision requirements. Various proposals for system modification, department reorganization, fleet expansion, and shop staffing can then be assessed. The project team is guided by the applications listed in Table 3.

The third step is to make whatever changes are required to implement the new equipment management system. The programs and procedures are flexible and can be modified as necessary. On the other hand, modification of operating procedures may be in order to best utilize the full potential of the PTI/APWA Equipment Management Package. A mix of system modifications, and procedural changes is the most common alternative. Thus, there is a trade off available to the administrator that balances different kinds of benefits, technological or organizational, depending on local needs.

Finally, the benefits of package implementation must be calculated. An illustration of benefits expected from current applications is shown in Table 4. Similar benefits can be derived, and precise values assigned, when presenting results of the project to the public.

PROJECT COSTS

The Equipment Management System (computer programs and system documentation) is available from the National Technical Information Service (NTIS), Springfield, Virginia or from PTI.

Table 3

BASIC PACKAGE APPLICATIONS

TO MINIMIZE EQUIPMENT DOWNTIME

- o Preventive maintenance schedules.

TO MINIMIZE EQUIPMENT OPERATING AND MAINTENANCE COSTS

- o Detailed fuel mileage and operating costs.
- o Detailed repair characteristics and maintenance costs.

TO COMPARE EQUIPMENT PERFORMANCE

- o Detailed operating and maintenance characteristics for classes of equipment.
- o Detailed operating and maintenance characteristics for using agencies.
- o Detailed equipment usage characteristics.

TO DETERMINE OPTIMUM REPLACEMENT CYCLES

- o The effect of mileage on operating and maintenance characteristics.
- o The depreciated value of equipment.
- o Maintenance cost characteristics for each class of equipment.

TO DECREASE CLERICAL DUTIES

- o System preparation of interdepartmental billings.
- o System scheduling of periodic maintenance.
- o Production of cost accounting records.

TO PERFORM HISTORICAL ANALYSIS

- o Trends in individual equipment operating characteristics and costs.
 - o Trends in organizational equipment operating and maintenance characteristics and costs.
 - o Trends in equipment class operating and maintenance characteristics and costs.
-

Table 4

PACKAGE BENEFITS

OBJECTIVITY

- o An objective tool utilizing up-to-date approaches to equipment management.
- o Builds a strong information base on which to rest top management decisions.
- o Geared to flexibility and an orientation to performance.
- o Describes garage operations for top management evaluation.

IMPROVED EQUIPMENT MANAGEMENT

- o Increased data utilization.
- o Increased control of operations.
- o Centralized fleet information.
- o Analytically oriented reports.

ACCURACY AND TIMELINESS

- o Increased accuracy of Input/Output data.
- o Improved reporting elements.
- o Increased flexibility of report generation and distribution.
- o Provides machine readable data for use by other data processing applications.

DOCUMENTED COST ADVANTAGES

- o Improved budgeting decisions, with positive impacts on equipment/personnel.
 - o Provides a common basis for comparing costs to the experience of other jurisdictions.
 - o Provides staff with a strong background in systematic approaches to equipment management problems.
 - o Improved equipment availability at decreased costs.
 - o System flexibility for organizational flexibility.
-

The system is available from PTI with technical implementation assistance free of charge to PTI subscribers. Non-subscribers can obtain the system and technical assistance from PTI for a fee.

The actual cost of implementation is borne by the implementing jurisdiction. The basic requirements are for data collection, processing, and system support personnel. Personnel levels vary with fleet size and the particular system configuration which is implemented. The detailed procedures in the Systems User's Guide provide a firm basis for more refined cost estimates. For many jurisdictions, starting up the system using the PTI package requires three to six calendar months during which staff people develop the initial data base, convert to the new system, and develop other information needed for computer operation.

Following implementation, the system requires one-fourth or more of a person's time for data control activities, the exact amount of time depending on fleet size. If automated data input devices are not available, data preparation will require the time of approximately one person per one-thousand pieces of equipment for preparing fuel and repair transactions for input to the system. This may not be an increase over present staffing. Depending on a jurisdiction's present staff size, the system may free up personnel from existing duties to perform these duties.

TECHNICAL ASSISTANCE

Local administrators and elected officials are invited to contact PTI for further information regarding the system. Some jurisdictions with limited technical resources

may require specialized backup services. Whatever is appropriate to the specific situation is obtainable by contacting:

- o Public Technology, Incorporated
Equipment Management System Technical Assistance
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036
202/452-7700

PTI can assess local requirements and provide telephone consultation or on-site visits. Following implementation, the experiences of local project teams will be incorporated into future revisions of system documentation to increase the benefits to other jurisdictions.

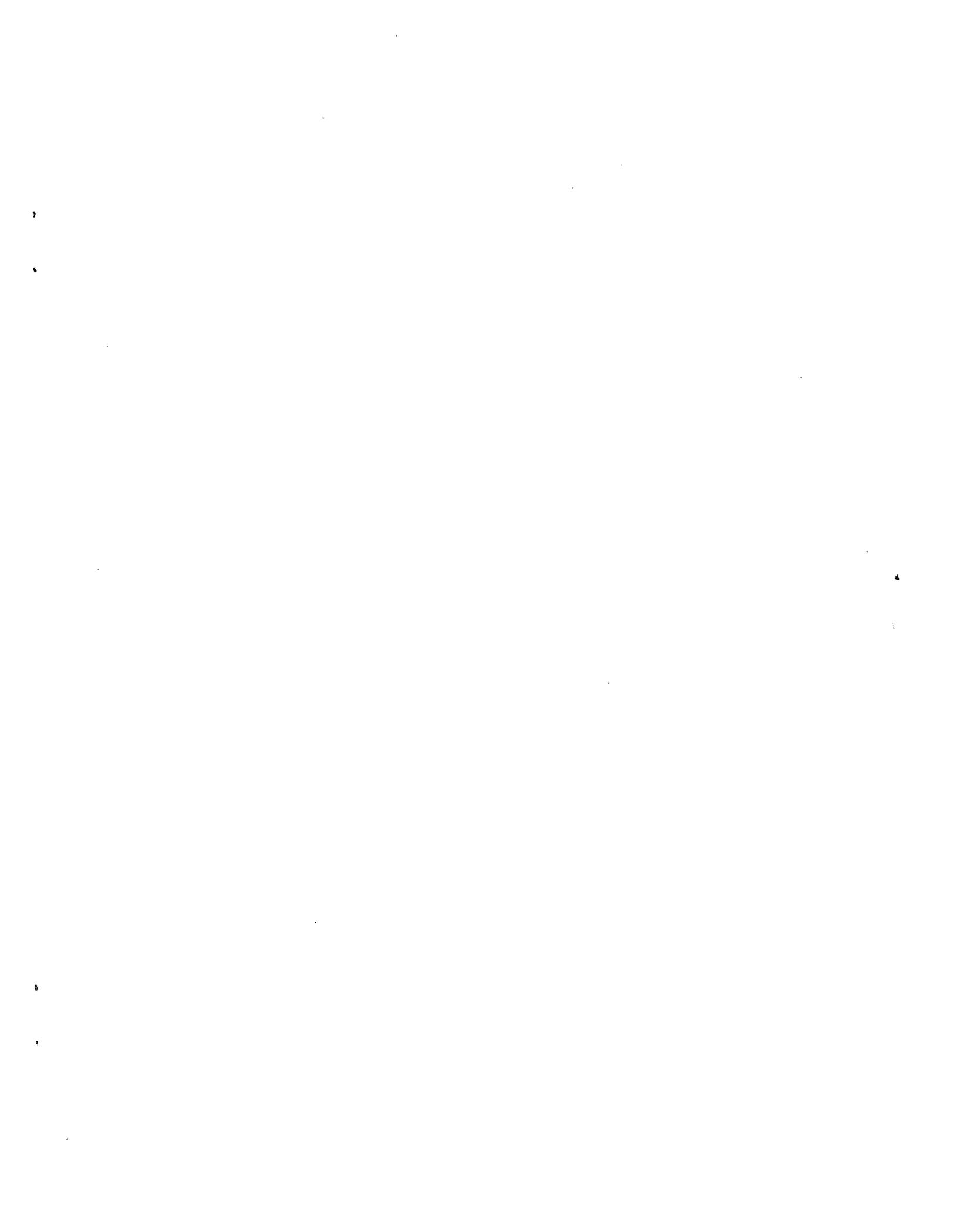
ACKNOWLEDGMENTS

The PTI/APWA Equipment Management System Package was developed, tested and documented by Public Technology, Inc. (PTI), Dade County, Florida; Milwaukee, Wisconsin; and Ft. Lauderdale, Florida. The work was done in conjunction with the Department of Housing and Urban Development (HUD), Office of Policy Development and Research; and the American Public Works Association (APWA).

PTI and APWA convened a committee of local government personnel to define system requirements prior to development. This requirements committee was composed of administrators, finance officers, equipment managers, and data processing personnel from 25 representative jurisdictions. The product of this committee was a generalized system concept involving preliminary forms, report formats, and procedures.

A seven member steering committee was then appointed to oversee and guide the development of the system to insure its quality and relevance to the generalized system as specified by the requirement committee. This committee was composed of a representative from the International City Management Association (ICMA), the Municipal Finance Officers Association (MFOA), the Institute for Equipment Services (IES), two APWA member jurisdictions, and two PTI subscribers. Under the guidance of the steering committee, PTI developed the detailed system design.

Computer programming was performed by the data processing staffs of three local governments with PTI coordination. PTI provided program specifications to Dade County, Florida; Ft. Lauderdale, Florida; and Milwaukee, Wisconsin. Each of these jurisdictions programmed and tested portions of the overall system and transferred these to the other jurisdictions until each of the three jurisdictions had all the programs for the entire system.



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