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PTI/APWA Equipment Management
Information System
Implementation Handbook

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

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PTI/APWA EQUIPMENT MANAGEMENT INFORMATION SYSTEM

IMPLEMENTATION HANDBOOK

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

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

**REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
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SPRINGFIELD, VA. 22161**

PTI/APWA EQUIPMENT MANAGEMENT SYSTEM

IMPLEMENTATION HANDBOOK

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, Inc.
1140 Connecticut Ave., NW
Washington, D.C. 20036

1977

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INTRODUCTION

This handbook is a guide to the implementation of the PTI/APWA Equipment Management Information System. Intended to structure the efforts of an interdepartmental project team, the handbook provides information on project administration, and on the detailed tasks of implementation.

Throughout the handbook, the emphasis is on accommodation of the differing needs of individual jurisdictions. It is unlikely that the implemented equipment management system will be exactly the same in any two jurisdictions. One of the main responsibilities of the project team, then, is the adaptation of the basic system to meet local requirements.

Project team activities include the following:

- Making computer programs operational on the jurisdiction's computer system;
- Ensuring system input forms are compatible with equipment management operations;
- Initiating procedures for the completion and collection of input forms and the routing of output reports;
- Providing the system with the preliminary data needed for system start-up; and
- Operationalizing the new system.

Six to nine months is the usual length of time required to complete these activities, although this will vary according to local circumstances. In each jurisdiction, the level of resources and effort devoted to system implementation, and the nature and extent of required system modifications, determine the time needed to complete the project.

The Implementation Handbook should be used in conjunction with other system documentation, namely:

- "Chief Executive's Report" (a system overview for the top level manager);
- User's Guide (a complete description of all system features, input forms, procedures, and output reports);
- Forms Completion Instructions (detailed instructions for completing all recommended system input forms);
- Program Documentation (a complete technical description of all computer programs and job streams); and
- Testing Procedures (instructions and materials for installing basic system programs on local equipment).

PTI technical assistance may be required to deal with special questions that arise during system implementation, and to review alternative implementation approaches. PTI personnel will be available for written and telephone assistance, and on-site assistance when necessary.

PROJECT ADMINISTRATION

Implementation of the equipment management system is a major local government project, for which specific staff time and financial resources must be set aside. The principal responsibility for implementation rests with an interdepartmental project team (described in Section 1.2). Individual team members carry out specific duties according to an agreed upon workplan. The project occasionally requires the services of personnel who are not members of the project team, such as computer programmers, forms designers, functional specialists, and documentation analysts.

1.1 Management Commitment

Management commitment is necessary to ensure the allocation of staff and financial resources necessary for implementation of the equipment management system, and to obtain the cooperation of the many different agencies that will be affected by the system. These agencies include, in addition to the equipment management agency, all agencies that use fleet equipment, and agencies that are concerned with fleet policy and finance.

In order to obtain needed cooperation from those responsible for allocation of funds and from affected agencies, the city manager or other chief administrative official must give full backing to the system. Once a preliminary project budget and work plan have been developed, the chief executive must clearly establish the priority of the project, the resources to be committed, and the authority of the project team leader. The chief executive must inform the legislative body and all affected agencies of implementation project activities and potential system impact.

1.2 Assemble Project Team

Successful implementation of the equipment management system depends on the efforts of the project team. The project team plans and carries out the implementation of the system, and monitors progress. Included in the responsibilities of the project team are the preparation of the project budget and work plan; the detailed review of the basic system, including all forms, reports, processes, related procedures, and data processing operations; the determination of modifications to the system, or to current equipment operations, needed for successful implementation in the jurisdiction; the assignment of tasks to project support staff (e.g., programmers, forms designers, accountants, technical writers); and the monitoring of implementation progress.

1.2.1 Representation on the project team

Every agency affected by the equipment management system should be represented on the project team, to ensure that the implemented system will meet the needs of all these agencies, and that it will be fully accepted by them. The nucleus of the project team is comprised of one representative each from the office of the city manager or other chief administrative official, the Equipment Management Office (or other agency with responsibility for fleet management), and the Data Processing Agency. The size of the project team should not exceed ten people, to ensure effective team meetings.

Project Team Leader

The representative of the chief executive serves as the project team leader, and acts with the backing of that official. The project team leader has overall responsibility for planning, management, and budgeting, and for assuring the cooperation of the various agencies impacted by the system. The project team leader must be sensitive to the concerns of top management, and possess effective communications skills.

Equipment Management Office Representative

The representative from the Equipment Management Office has final responsibility for determining the compatibility of system forms, reports, and procedures with present operations. Because of the extensive impact of the system on equipment management operations, the Equipment Management Office should be represented by the top equipment management official (e. g., the Equipment Manager or Fleet Superintendent).

Data Processing Agency Representative

While the director of data processing should be informed of all system implementation activities affecting the Data Processing Agency, the director will not necessarily represent the Agency on the project team. The representative of this agency--possibly a Programmer/Analyst--reviews all system implementation plans to determine their effect on the workload and day-to-day operations of the Data Processing Agency. He or she determines the feasibility of system alterations such as program modifications or forms conversions, and coordinates all Data Processing Agency support of project activities.

Other Team Members

Other project team members should include representatives of major equipment-using agencies such as police and fire, and agencies that will work from system reports, such as Budget and Finance. Additional equipment management employees, such as shop foremen, may also make a valuable contribution to the team. These team members need not attend every project team meeting, but should attend those sessions addressing subjects related to their departmental concerns.

1.2.2 Selection of the Data Control Clerk

As described in the User's Guide,* the Data Control Clerk, an equipment management office employee, plays a crucial role in all aspects of system operations. The Data Control Clerk checks all input data, traces and corrects all data errors, and verifies the content of all output reports. Since a major responsibility of the project team is the review, discussion, and occasional modification of system forms, reports, and procedures, the Data Control Clerk can contribute to and learn a great deal from project team activities.

Once a budget and work plan for the project are approved, the Data Control Clerk should be appointed and should begin to attend all non-administrative meetings of the project team. Through an involvement in system implementation, the Data Control Clerk gains a thorough familiarity with the system as it will operate in his or her jurisdiction.

1.2.3 Convening the project team

The project team should meet often enough to ensure proper project control. Early in the project, when an administrative framework for project activities is being set up, frequent meetings may be necessary. At a minimum, regular project team meetings should be held every two weeks; extra meetings should be convened as necessary.

* Refer to the System User's Guide, Section 1.1.4.

1.3 Develop Work Plan

A project work plan establishes a schedule for implementation activities, and helps determine the resources necessary to support implementation of the equipment management system. The basic tasks and steps of implementation are outlined in Section 3 of this handbook; however, actual staff time, training, and materials requirements will vary in each jurisdiction, depending on the compatibility of the system with current equipment management operations.

1.3.1 Review system documentation

In order to determine the extent and particulars of the effort that will be required to implement the equipment management system in a given jurisdiction, members of the project team should thoroughly review system documentation. In this review, team members should strive to gain a broad familiarity with the system, so that they may begin to think about specific requirements for local implementation.

Equipment management system documentation includes documentation relating to on-going system operations, and material addressing system implementation. The former can be divided into two types--user and data processing oriented documentation. (Refer to Table 1).

A review of the system should begin with the "Chief Executive's Report". This brief document, directed to top level management, will provide the project team with an overview of system objectives. Next, the system User's Guide should be studied. Intended for those involved in day-to-day system operations, and those routinely receiving system reports, this document provides the following:

- An orientation to the system as a whole, its structure, codes, and operations;

Table 1
PTI/APWA EQUIPMENT MANAGEMENT SYSTEM
DOCUMENTATION

	User-Oriented Documents	Data Processing-Oriented Documents
	<p>Overview Documentation</p> <p>Working Documentation</p> <p>Transfer Documentation</p>	<p><u>Program Documentation</u></p> <p><u>Testing Procedures</u></p>

- An account of the functioning of each system module; and
- A detailed description of each module process, and the forms, reports, and procedures supporting that process.

Since the project team will constantly refer to the system User's Guide throughout implementation, a copy should be made available to each team member.

Data Processing Agency representatives on the project team should lightly review the seven volumes of Program Documentation, to gain working knowledge of the organization and content of that document. A reference document, the Program Documentation is written for an audience of data processing analysts and programmers. It explains the proper run sequence for computer programs, necessary input, the logic of each program, and output reports generated. During the implementation, Program Documentation should be consulted in order to establish job streams and to deal with problems encountered in implementing a particular computer program.

Upon completion of the review of the documents described above, the project team should turn its attention to the present document--the Implementation Handbook. Used in conjunction with other system documentation, the Handbook is a guide to implementation; providing information on project organization, work tasks, and time requirements.

1.3.2 Draw up schedule of implementation tasks and assign staff responsibilities

The magnitude of the work involved in system implementation will depend on the extent of required modifications to the system and/or to current local equipment management practices and operations. Where minimal modifications are required, implementation should proceed smoothly. Major modifications will result in substantial time

implementation should proceed smoothly. Major modifications will result in substantial time spent in modifying and testing forms, designing and testing procedures, and changing computer programs.

On the basis of the documentation review, the project team should determine the specifics of the implementation tasks and steps described in this handbook, as they relate to the particular needs of the local jurisdiction. Once this has been accomplished, preparation of the actual work plan can begin.

The work plan should identify each task and step in a time-phase relationship; a PERT chart or other time-phase project management technique is particularly helpful for this purpose. Personnel and products associated with each task should be identified.

A work plan is the basis for resource allocation decisions; top management in the jurisdiction will have to balance technical project requirements against what is administratively and financially feasible. As such, the project work plan will have to be revised to reflect actual resource allocations. Subsequent revisions may be necessary to accommodate reallocation of resources or schedule slippages.

1.4 Plan System Cycle Timing

The equipment management system operates in annual and monthly cycles. The annual cycle determines the beginning and ending dates for cumulative annual totals. Many system files accumulate information throughout a system reporting year, providing information for "year-to-date" totals on system reports. Since annual totals are often used to project budgetary needs, most jurisdictions will want the system reporting year to coincide with the fiscal year.

The monthly system cycle relates to the collection and processing of data for monthly reports. For any given monthly period, data from Fuel Transaction Forms, Repair Order Forms, Motor Pool Tickets, 'Monthly Meter Report'/Forms, and the Month-End Data Form must be submitted to the system and validated, before month-end processing begins and monthly reports are generated. Unless all such forms dated during the period are submitted, system files and reports will be inaccurate.

The equipment management system operates on a twelve month year; however, monthly periods need not begin on the first day of each calendar month. Beginning and ending dates for the monthly cycle should be established according to local needs.

Three factors should be considered in establishing the closing date for a monthly reporting period (the end of a monthly cycle):

- When is the information contained in monthly reports needed?
- What will be the time lag between the last day of a monthly reporting period and the actual distribution of monthly reports?
- When is the data needed for month-end processing available?

The first of these factors usually determines the monthly cycle. Most jurisdictions want to coordinate the monthly equipment management reporting cycle with their accounting cycle in order to take advantage of the cost data generated by the Fuel, Repair, and Billing Modules. The project team should also consider repair shop procedures for scheduling preventive maintenance, to determine when would be the best time for repair personnel to receive monthly preventive maintenance reports.

Once the project team has determined when reports are needed, it should consider the time lag between the closing date and the distribution of monthly reports. This reporting lag, which may be as long as one work week, results from routine delays in the routing of completed forms to the Data Control Clerk, from the time required for initial keypunching and data entry, from the time required to trace and correct initial data errors (this often involves contacting agencies, fuel sites, and repair shops), and finally from the time required for actual month-end processing.

The reporting lag, then, is determined by the following:

- Overall Data Processing Agency workload;
- Data volume;
- Data error rate; and
- Error correction time.

Project team members should carefully examine variations in the workload of the Data Processing Agency over a month, and analyze expected data volumes. During the first few months of full system operation, high error rates might be expected due to the unfamiliarity of system personnel with new forms. Similarly, it might take several months for the Data Control Clerk to gain proficiency in error correction. In

Table 2

PROCESSES AND FORMS ASSOCIATED WITH THE MONTHLY CYCLE

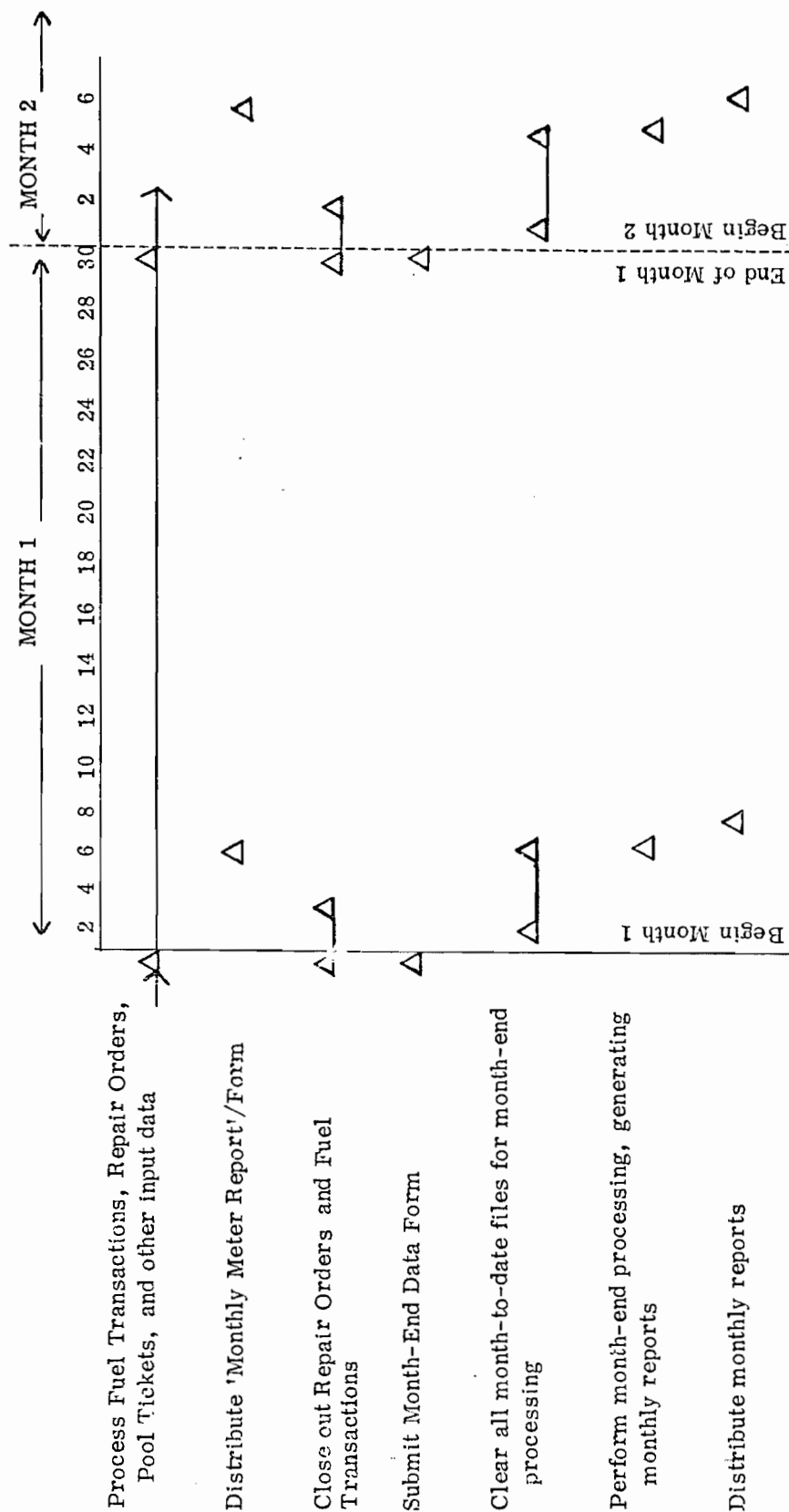
<u>Process</u>	<u>Related Form</u>
DISPENSING FUEL AND OTHER COMMODITIES	Fuel Transaction Form
REPAIRING EQUIPMENT	Repair Order Form
USING MOTOR POOL EQUIPMENT	Motor Pool Ticket
COLLECTING MONTHLY METER READINGS	'Monthly Meter Report'/Form
CLOSING OUT A MONTHLY REPORTING PERIOD	Month-End Data Form

establishing an initial monthly cut-off date, the project team should expect at least a one-week reporting lag, assuming the Data Processing Agency can handle the load. If this lag is reduced after several months of system operations, reports can be produced a day or two earlier.

When a tentative cut-off date is settled on, the project team should review all processes relevant to the monthly cycle (refer to Section 2 of the User's Guide) to ensure that all necessary data will be available and ready for processing at that time. These processes, and their associated input forms are listed in Table 2. The various activities that are part of the monthly cycle, and their time-sequenced relationship, are illustrated in Figure 1.

Figure 1

THE MONTHLY SYSTEM CYCLE



1.5 Conduct Staff Briefing

One of the best ways to ensure successful implementation of the equipment management system is to dispel the rumors and fears that automation plans so frequently engender. The project team should decide whether a meeting of all employees potentially impacted by the system or a key-person briefing is better suited to the purpose of characterizing the system as a new tool designed to enhance the equipment management function and assist those associated with that function.

The predominant attitude must be positive, and the emphasis must be on the more effective use of capital resources and better informed decision making by employees at all levels. Fears regarding job security should be allayed with the assurance that no reduction in clerical effort is expected. While the system may produce reports previously prepared by clerical staff, it also generates new clerical duties -- review of error listings, tracking down of data errors, and examination of reports for highlights and exceptions of interest to management.

The cooperation of individual employees is essential. To secure it, they must be told of their important roles and the ease with which they will learn to use this new tool; e.g., through training in recording the data on new forms, or in facilitating the scheduling of preventive maintenance, and so forth.

Public Technology, Inc. may provide assistance in conducting such briefings. A question and answer session should be included in the preliminary briefing, and follow-up measures should be taken later. Chief among these are subsequent briefings for key-person groups, at which any further employee questions can be explored, and newsletter items, which can keep the entire staff informed of the latest progress.

1.6 Plan For First Year of System Operation

Planning for the first full year of operation of the equipment management system involves the determination of financial and staff resources required to operate the system on an on-going basis. From experience gained during implementation and the first months of system operation, the project team should be able to calculate monthly volumes of input data, forms requirements, computer time requirements, and the time required each month for data processing and error correction.

The project team should estimate the annual man-hours required for data collection, data entry, and error correction. Annual computer time needs should also be calculated, along with forms printing costs. Subsequently, a first year budget for system operation can be prepared.

OVERVIEW OF SYSTEM IMPLEMENTATION

Implementation of the equipment management system involves two kinds of adaptations: adaptation of the equipment management system to accommodate local equipment management practices, and adaptation of those practices so that they adequately support the system. Adaptation of the system may entail modification of system reports, forms, or procedures. Adaptation of local practices may involve alteration of current modes of operation, forms, and reporting requirements.

2.1 What's Involved in Implementation

Since the purpose of the equipment management system is to support the equipment management function, the main burden of implementation rests with system users; they determine the extent to which present practices can be altered, and the extent of system changes required. While Data Processing Agency representatives on the project team have significant implementation responsibilities, their role is primarily that of technical consultants. They know the capacity of their equipment, as well as the technical feasibility of proposed system changes; and of course, they execute forms design and computer program changes.

2.1.1 Process orientation

In view of the responsibilities of the non-data processing representatives on the project team, the Implementation Handbook generally follows the pattern of the User's Guide in presenting the system and system implementation in functional, rather than data processing terms.

For non-data processing personnel, the "process" is the basic unit of the equipment management system. Processes correspond to simple equipment management functions, divided among three categories -- data gathering and processing, report preparation, and report use. In the data gathering and processing category, for example, processes include FUELING EQUIPMENT (gathering and processing data concerning fuel transactions) and COLLECTING MONTHLY METER READINGS (odometer or hourmeter reading). In the report preparation category processes allow for the generation of special trouble shooting reports that are not produced on a regular basis. Finally, report use processes involve the use of information generated by the system to

prepare interdepartmental billings and to schedule preventive maintenance.

Some processes correspond to more than one equipment management function. For example, the Equipment Inventory Module process CHANGING EQUIPMENT INVENTORY DATA notifies the system of changes in billing rates for equipment, of reassignment of equipment to different using organizations, and so forth.

Most processes involve one or more input forms, one or more output reports, and a procedure for using and transmitting these forms and reports. Some forms are used in more than one process; some reports are produced by more than one process. In general, input forms and output reports are common to processes in a single module; occasionally a process in one module uses input forms, reports, or even procedures from another module.

2.1.2 User responsibilities

Responsibilities of non-data processing personnel on the project team are three-fold. First, they must evaluate the requirements for system modification, or modification of current equipment management practices. This entails a limited systems analysis of all aspects of equipment management operations that are impacted by the system. The compatibility of current forms, procedures, and reporting requirements should be carefully examined.

Second, the project team must make tentative modifications of forms, reports, and procedures in accordance with their findings. Modifications must be tested and refined.

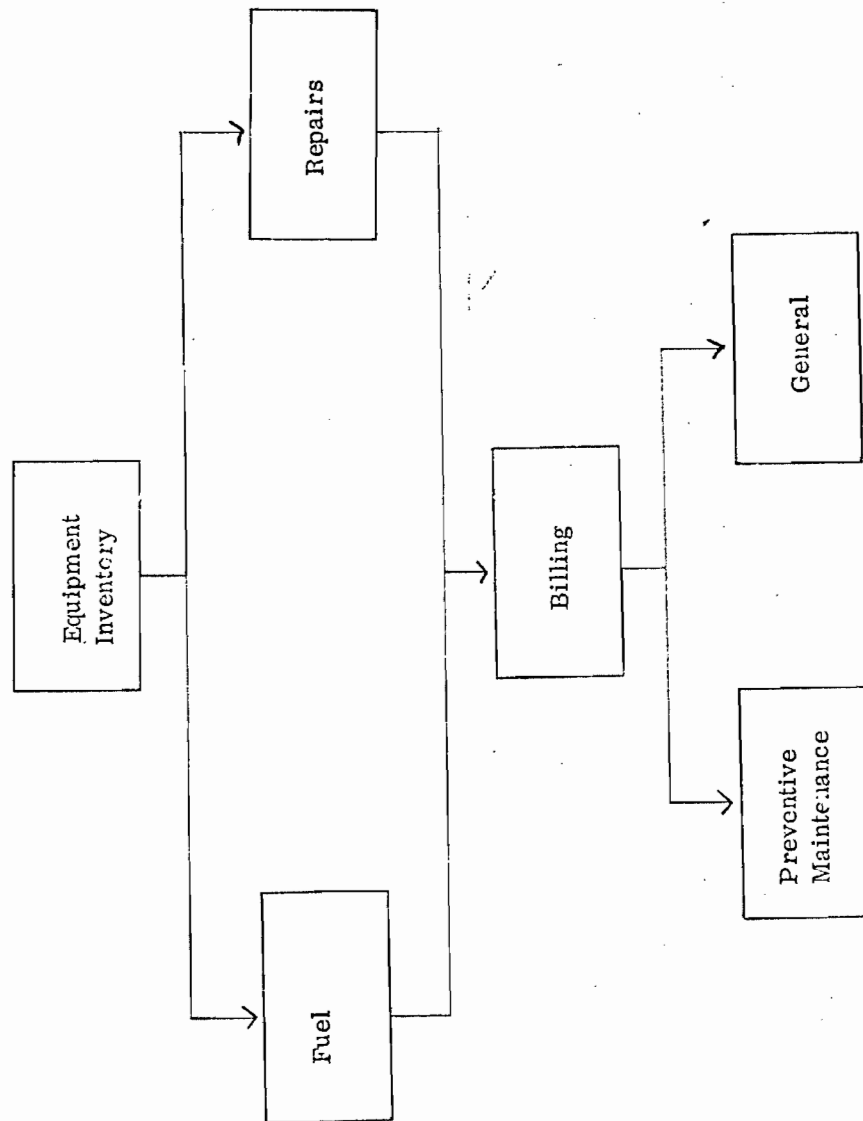
Finally, the User's Guide must be modified to reflect all modifications that have been adopted.

2.1.3 Data processing responsibilities

Data Processing Agency representatives on the project team have four principal responsibilities: data processing conversion, preparation of the Data Processing Operations Guide, modification of computer programs and Program Documentation as required, and participation in the testing of module processes.

Data processing conversion involves compiling the programs, developing job streams (e.g., using JCL), and testing the job streams with standardized test data provided by PTI. The Data Processing Operations Guide is to be prepared according to instructions given in Task 1 in Section 3 of the Handbook, conforming with local Data Processing Agency standards. Computer programs may require modification as a result of forms revision or report format changes; Program Documentation will have to be revised accordingly. Participation in the testing of module processes involves running the various system jobstreams in order to process test data and to generate module reports.

Figure 2
Module Implementation Sequence



2.2 The Structure of Implementation Activities

On the basis of past implementation experience, Public Technology, Inc. has developed a process consisting of fifteen tasks, to structure the efforts of the implementation project team. Taking into consideration the interrelationship of system modules, the process minimizes backtracking and duplication of effort. Each task builds on the previous one. Thus, requirements for module adaptations are determined before, rather than after they are operationalized.

2.2.1 The implementation sequence

Roughly speaking, the implementation of the equipment management system is accomplished in six phases, each phase corresponding to the implementation of one of the system modules. The required sequence for module implementation is shown in Figure 2. The Equipment Inventory Module must be implemented first, since all other modules routinely reference data maintained in the Equipment Inventory Master File. Implementation of the Fuel and Repair Modules follows; these modules can be implemented sequentially or simultaneously. The Fuel and Repair Modules supply up-to-date operating and maintenance data for all equipment to the Equipment Inventory Master File; until such data is routinely supplied to the Master File, the three remaining modules cannot be implemented.

Billing is implemented before the Preventive Maintenance and General Modules because it provides accurate month-end mileage data needed for Preventive Maintenance and General reporting. The Preventive Maintenance and General Modules can be implemented sequentially or simultaneously.

2.2.2 The Implementation Tasks

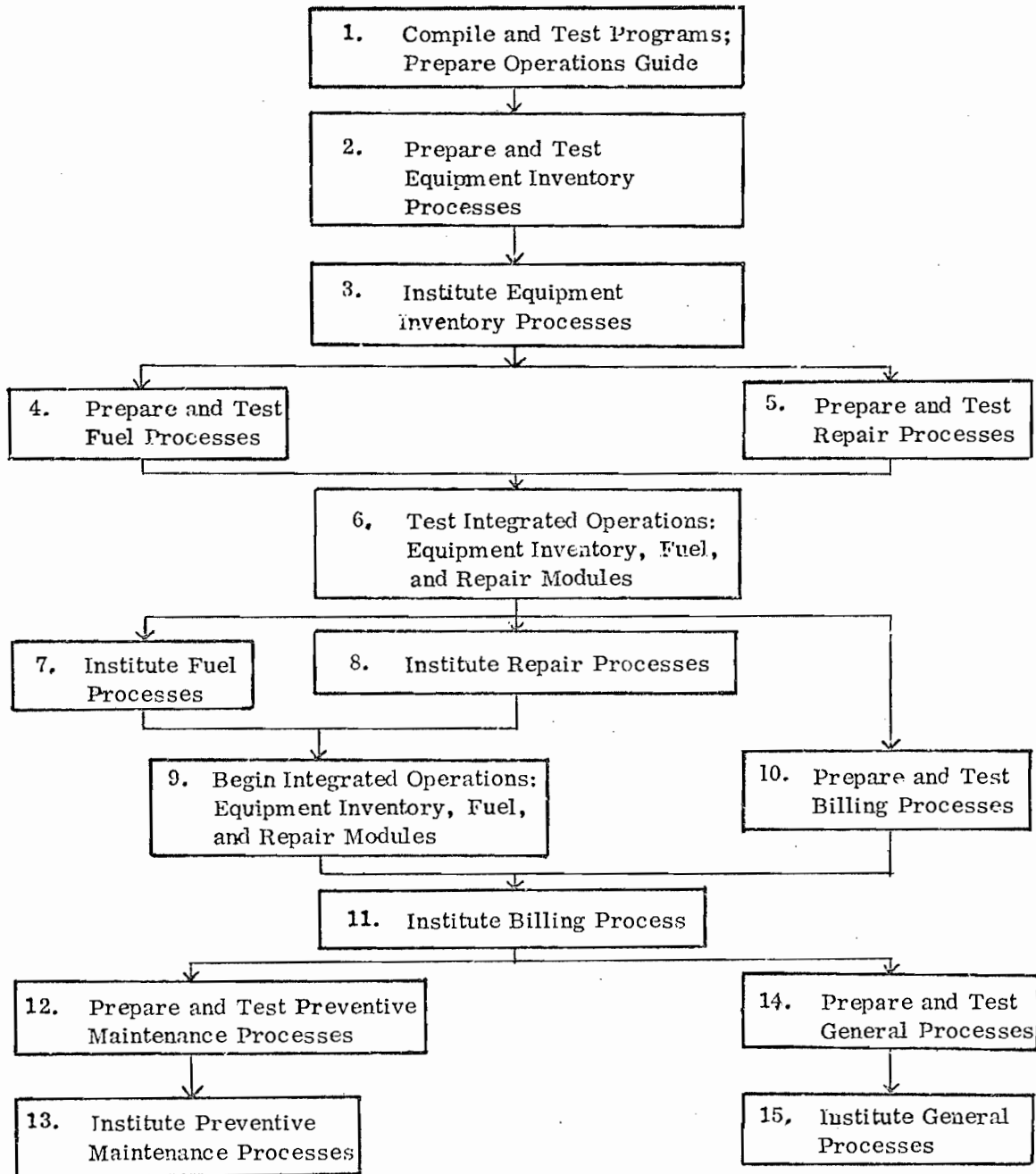
The actual implementation process (see Figure 3) is more complex than the phased sequence described in the preceding section. The implementation of each module is accomplished in stages; first comes preparation for and testing of the module processes, then the instituting of module processes throughout the jurisdiction. Each stage is treated as one task in the implementation process. Thus, twelve of the fifteen tasks relate directly to the modules.

One preliminary task precedes all module implementation tasks: data processing conversion (compiling and testing the computer programs), and preparation of the Data Processing Operations Guide.

Two other tasks remain, involving integrated operations of the three core modules--Equipment Inventory, Fuel, and Repair. First, before Fuel and Repair Module processes can be instituted jurisdiction-wide, the project team must successfully update the Equipment Inventory Master File with data submitted through the Fuel and Repair Modules. When this first task is accomplished, and the Fuel and Repair Module processes instituted, regular integrated operations can be initiated (the second task).

Figure 3

PTI/APWA EQUIPMENT MANAGEMENT SYSTEM
IMPLEMENTATION PROCESS



2.3 Common Steps in the Preparation and Testing of Individual Modules

Preparation for and testing of module processes, (Tasks 2, 4, 5, 10, 12, and 14) constitute the major work of the implementation project. Preparation and testing is accomplished in a series of six steps:

1. Study module process in the context of current equipment management functions;
2. Plan for module operations; adapt reports, forms, and procedures;
3. Complete functional and technical preparations;
4. Begin staff training;
5. Test and validate module processes; finalize reports, forms, procedures, and programs; and
6. Finalize system documentation.

These steps are described below in general terms. The specifics relating to individual modules are outlined under individual tasks in the latter sections of the handbook.

2.3.1 Step 1: Study module processes in the context of current equipment management functions

Obtain a complete familiarity with module operations, and determine any disparities between module processes and current equipment management functions. Some module processes may support functions that are not a part of current operations. Other module processes may require input data that is not currently collected by the jurisdiction. Some module processes may produce information in a format inappropriate for the jurisdiction. Input forms currently used in the jurisdiction may not be suitable to support module processes.

Reports and report descriptions presented in the system User's Guide should be scrutinized by those who will receive and use those reports. Those reviewing Management/Operations Reports should note any changes required in the content or format of a report, to make that report useful in the jurisdiction. The Data Control Clerk should become thoroughly familiar with both Management/Operations Reports and Data Control Reports, to gain an understanding of potential error conditions, and how the sources of those errors can be identified and the errors corrected in a timely manner.

Next, the data required on module input forms should be reviewed (refer to Section 2 of the system User's Guide) and compared against the data that is currently maintained in the jurisdiction. Personnel involved in the recording of such data should be identified. In analyzing input forms currently in use, project team members should consider whether:

- a) Input forms record data in the element sequence and format required by the equipment management system;
- b) Input forms record all necessary data, but the sequence and format differ from that required by the system; or
- c) Input forms do not collect all necessary data.

In reviewing procedures for accomplishing module processes (see Section 2 of the system User's Guide) project team members should give thought to how present staff might be used to execute, and how present operations might be modified to accommodate, such procedures.

2.3.2 Step 2: Plan for module operations; adapt reports, forms, and procedures

This step draws on the work of the previous step and requires the efforts of

both system user and data processing personnel in determining how module processes will adapt for use in the jurisdiction. To facilitate implementation, system modifications should be limited to those required for successful installation in the jurisdiction. Only after several months of successful system operations should a jurisdiction consider major enhancements or changes to the system.

In planning the adaption of module processes, necessary modifications in the content or format of reports should be determined first. Such modifications should not be made unless absolutely necessary. Changes in the content of reports may necessitate the inclusion of additional data elements on input forms. Changes of any kind in reports will require modifications of one or more computer programs.

The analysis of input forms currently in use provides the starting point for planning of system input forms for the jurisdiction. Form revision will be required if present forms lack necessary data elements. If all data elements are presently recorded but in an inappropriate sequence or format, the project team has two options: forms can be altered, or a pre-processor computer program developed to transform the familiar format into the format accepted by the system.

The extent to which forms in daily use are revised should be compatible with the ability of personnel to adjust to new forms and procedures. Substantial form changes may lengthen time required for successful system implementation.

Once module reports and forms have been tentatively agreed upon, the procedures outlined in the system User's Guide should be tailored to the needs of the jurisdiction. Procedural modifications will probably involve only the collection of data, the routing of Management/Operations reports, and the filing of forms and reports; in most cases intermediate activities will remain unchanged. All completed input forms must be

reviewed by the Data Control Clerk before submission to the Data Processing Agency. Similarly, the Data Control Clerk must review all reports and take steps to correct any errors before Management/Operations Reports are forwarded to the proper parties.

In many cases the procedures included in the system User's Guide will require elaboration to describe complex data collection or report usage routines. For example, a jurisdiction may want to establish a routine for collecting necessary equipment inventory data from various agencies whenever a new piece of equipment is added to the fleet. Or, a jurisdiction might want to establish a routine for billing agencies for the use of fleet equipment, based on information contained in the 'Departmental Billing--Direct and Rental Charges' report. Or, jurisdictions may want to particularize procedures by establishing dates or times for the performance of certain activities.

A manual filing system for forms and reports should be established. Recommendations concerning the filing of forms are contained in the module input tables in the User's Guide. Similar recommendations concerning reports are given in the procedure tables accompanying process descriptions, also in the User's Guide. Project team members should review these recommendations, along with all reports and forms, and decide which they want to retain, and for how long. A single filing system should accommodate the forms and reports for all modules.

In executing this step, the project team should recognize that many module processes are interrelated. Careful consideration should be given before any report, form, or procedure is altered (or deleted). Any modification may require changes in supporting computer programs. The ramifications of these changes on other aspects of the system must be considered.

2.3.3 Step 3: Complete functional and technical preparations

The project team must undertake a series of preliminary activities before module processes can be tested, and before regular module operations can begin. These activities vary for each module, but they can be broken into two general categories--functional and technical.

Functional preparations include establishing codes to be used in completing input forms (e.g., codes to designate organizations using fleet equipment, shop facilities, and so forth), and planning for any special data collection efforts required to establish a data base for module operations (e.g., for the Equipment Inventory Module, collection of data about each piece of fleet equipment).

Technical preparations include changing computer programs to accommodate modifications to reports, forms, or procedures. Report headings must also be modified to show the name of the appropriate jurisdiction. Finally, computer files may need to be initialized so programs can be run.

2.3.4 Step 4: Begin staff training

Personnel involvement varies for each module; repair shop personnel are primarily concerned with Repair and Preventive Maintenance Module processes, while pump attendants are only involved in Fuel Module processes. For most modules, staff training should be undertaken in stages. At first, training should be limited to those personnel involved in module testing. In the case of the Repair Module, for example, staff training can be restricted to the one repair shop where processes are tested. Training of remaining affected personnel should follow the finalization of module reports, forms, and procedures.

Training in module procedures and use of forms should be tailored to the jurisdiction and conducted as with training in any procedure or skill. Visual aids are helpful, and practice with actual materials and realistic situations will give a good indication of training effectiveness and will highlight problems. It may be appropriate to train supervisory personnel first, who will, in turn, train their own subordinates--especially if this is the customary practice. Above all, employees should come to feel that the data recording for which they are responsible is an important part of their job.

Special attention should be paid to the responsibilities of the Data Control Clerk, who must learn how to quickly and efficiently track down erroneous data recorded on input forms, so that corrections can be made without disrupting the system reporting cycle.

2.3.5 Step 5: Test and validate module processes; finalize reports, forms, procedures, and programs

The testing of module processes on a limited basis enables the project team to identify and solve problems before actual module operation begins. The testing process allows for experimentation with report use, forms, procedures, and manual files. It provides an opportunity for personnel involved with the system to familiarize themselves with module processes, which will help smooth the transition to full module operations.

In order to conduct testing, a test site, or test group must first be selected. Depending on the module, this may be a group of vehicles, a single repair shop, or an organization using fleet equipment. Before testing some modules, initial data must be collected and entered into the system (this process will be repeated on a

larger scale at the start of full module operations). During testing, all processes should be used, and all reports generated and validated. If testing identifies problems, modifications to the reports, forms, and procedures established in Step 2 (Section 2.3.2) should be considered, along with associated program changes. Once the project team is satisfied with the module processes; reports, forms, procedures and computer programs can be finalized.

The project team should keep a log of experience during testing, which should be filed along with test data, files, and results for future reference. If a jurisdiction decides to modify the system at a later date, these materials will be valuable.

2.3.6 Step 6: Finalize system documentation

The system documentation prepared by Public Technology, Inc. for the equipment management system describes the system as it is supplied to recipient jurisdictions. Before initiating regular module operations, all system documentation must be modified to reflect any changes in reports, forms, procedures, and programs. These changes should be incorporated in the User's Guide and the Program Documentation. This documentation will subsequently describe the equipment management system as implemented in the jurisdiction, and serve as a useful reference for present and future personnel involved in equipment management.

2.4 Instituting Module Processes

Instituting module processes (Tasks 3, 7, 8, 11, 13, and 15) is accomplished for each module following module preparation and testing. In general, module processes are tested on a limited basis; only those personnel involved in testing are trained initially. The first step required to institute module processes, then, is to complete the training of affected personnel.

For some modules, instituting module process requires a preliminary data collection effort. Such is the case for the Equipment Inventory and Fuel Modules, requiring the collection of inventory data and pump readings respectively.

Processes that require instituting new data collection procedures are implemented in stages, e.g., one fueling or shop repair facility at a time. Until such processes are fully implemented throughout the jurisdiction, old procedures should be continued.

THE IMPLEMENTATION PROCESS

The presentation that follows assumes a thorough understanding of the operations of the equipment management system, as described in the system User's Guide. The User's Guide provides detailed descriptions of system processes and related forms, reports, and procedures that are frequently referenced in the succeeding pages.

Only those system forms used exclusively during implementation are included as figures in the text. All other forms and sample reports, are included in Appendices A and B of the User's Guide.

Note that the discussions of tasks dealing with preparing for and testing module processes (Tasks 2, 4, 5, 10, 12, and 14) and with instituting module processes (Tasks 3, 7, 8, 11, 13, and 15) highlight activities specific to individual tasks. For information on basic task activities always refer to the general discussion, Sections 2.3 and 2.4.

TASK 1: COMPILE AND TEST COMPUTER PROGRAMS:
DEVELOP PRELIMINARY DRAFT, DATA PROCESSING OPERATIONS GUIDE

TASK 1, Step 1: Assemble materials

The materials necessary for this task are as follows:

- Computer programs;
- Test data;
- Testing Procedures; and
- Program Documentation.

PTI supplies all computer programs and standardized test data on magnetic tape.

The document entitled Testing Procedures contains step-by-step instructions for testing the programs, along with test results (copies of valid output reports). Testing Procedures is used in conjunction with the comprehensive documentation of job streams and programs contained in the Program Documentation.

TASK 1, Step 2: Compile each computer program

Data processing personnel should compile each program, making only those modifications that are necessary to successfully compile that program. The CONFIGURATION SECTION of the ENVIRONMENT DIVISION in each program may require changes, depending on the manufacturer and model of your computer.

TASK 1, Step 3: Develop job streams

The Program Documentation describes the job streams for each module. On the basis of these descriptions, data processing personnel should develop job streams employing the job stream language used at the installation (e.g., JCL).

TASK 1, Step 4: Develop preliminary Data Processing Operations Guide

A draft version of the Data Processing Operations Guide should be prepared in a loose leaf binder. The Operations Guide should enable computer operations personnel to run the job streams developed in Step 3 above, during both testing and regular system operations.

Structure the Operations Guide by job stream. For each job stream include the following instructions:

- The sequence of computer programs and utilities in the job stream;
- The physical files accessed by each program;
- The retention time for each file;
- Job stream error messages; and
- Backup procedures.

The text prepared during this step is a working draft; data processing personnel may have to update the Operations Guide before full system operation begins, as a consequence of system modifications introduced during implementation.

TASK 1, Step 5: Test all programs

Data processing personnel should test each job stream in accordance with the instructions provided in Testing Procedures, using test data provided. All reports produced should be checked against the valid sample reports included in Testing Procedures. Testing is not complete until discrepancies between test reports and valid sample reports are eliminated. PTI personnel will be available to help with any problems encountered during this step.

TASK 2: PREPARE FOR AND TEST EQUIPMENT INVENTORY MODULE PROCESSES

Refer to the general discussion of task steps, Section 2.3

TASK 2, Step 1: Study module processes in the context of current equipment management functions

As far as the system is concerned, equipment exists only when there is a corresponding record in the Equipment Inventory Master File. Module processes update records in this file, indicating, for example, when a piece of equipment is deadlined, or assigned to a different using organization. Unless these records are kept accurate and up-to-date, the system cannot function effectively.

Special attention should be directed to the data required for initial completion of the Equipment Inventory Form. Is all of the data available? Where is it maintained? The completion instructions for this form should be reviewed carefully.

Project team members should also think through each process described in the User's Guide, determining who would provide the Data Control Clerk with the data needed to begin the procedure associated with that process.

TASK 2, Step 2: Plan for module operations; adapt reports, forms, and procedures

Equipment Inventory Module reports should not require modification at the time of implementation. As far as module forms are concerned, modifications should be limited to cosmetic changes to the Meter/Status Change Form or to the report request forms. The complexity of the Equipment Inventory Form is such that modification is not advisable.

In adapting module procedures to the local situation, one major chore will be establishing data collection routines to be followed when new equipment is added to the

fleet (ADDING EQUIPMENT TO THE FLEET). These routines should not be confused with the larger data collection effort associated with the initial construction of the Master File, when Equipment Inventory Forms must be completed for all present fleet equipment (refer to Step 3 below).

TASK 2, Step 3: Complete functional and technical preparations

Functional

Functional preparations for implementation of the Equipment Inventory Module primarily concern collection of the data required for initial completion of the Equipment Inventory Form for all fleet equipment.

To begin with, each piece of equipment in the fleet must be assigned a permanent equipment number, six digits maximum. This number should never be changed, even when equipment is reassigned from one organization to another. When equipment is reassigned, the organization code entered on the appropriate Master File record is changed.

Codes must be developed for four of the fields on the form--"Assigned Organization Code", "Assigned PM Location", "Insurance Schedule(s)", and "Assigned Service Location". Three special forms are provided for developing the appropriate codes: the Organization Codes Form, the Insurance Cost Codes Form, and the Shop (Facility) Codes Form (Figures 4, 5, and 6). Codes from the latter form are entered in both the PM and Service Location fields. All forms are eventually used by the Data Processing Agency to create computer tables and files, and should therefore be retained for later use.

In developing shop facility codes, the project team should examine those reports

ORGANIZATION CODES AND DESCRIPTIONS

ORGANIZATION TITLE (15 col.)

(10-24)

[illegible][illegible]This image shows a full page of blank graph paper. The grid consists of small squares formed by thin black lines. A vertical margin line runs down the left side of the page, creating a narrow column. There are also horizontal lines near the top and bottom edges, defining header and footer areas. The entire page is otherwise empty of any text or markings.

SHOP (FACILITY) CODES AND DESCRIPTIONS

[illegible]

that organize repair information by facility--the 'Shop Performance Report' (EMRR11) and the 'Shop Performance Analysis by Type of Repair' report (EMRR12). [Shop facility codes also appear on the 'Maintenance and Repair Activity Listing' (EMRR07) and the 'Departmental Billings--Direct and Rental Charges' Report (EMBR02)]. More than one site can be assigned a single facility code if the project team wishes to aggregate shop data (e.g., when several shops have the same management, or when a shop annex is located in a separate building).

In addition to developing codes, a procedure must be established for collecting all data needed to complete the Equipment Inventory Form for each piece of equipment in the fleet. This data is often maintained by several different agencies within a jurisdiction; financial data may be maintained by the Finance Department, descriptive data by the agency using the equipment, and preventive maintenance data by the repair shop.

The project team should note that proper completion of some of the fields on the Equipment Inventory Form may require judgements on the part of people involved in equipment management, such as shop foremen, the equipment manager, Finance Department personnel, and personnel from departments that use equipment. The following are among the questions that may have to be answered:

- What is the proper PM cycle for this equipment?
- How long is its estimated life?
- What will its salvage value be?
- What is the appropriate APWA code?

Depreciation rates for fleet equipment must also be established.

Tables of information relating to various classes of equipment and various using agencies will aid those responsible for completing the Equipment Inventory Forms.

These tables might include:

- Assigned organization and fund codes;
- Insurance schedules for various classes of equipment;
- Fuel types, tank capacities for various groups of equipment;
- Highway codes for various classes of equipment; and
- Duty hours per month for various groups of equipment.

Technical

Technical preparations for the Equipment Inventory Module include modifying programs so the proper jurisdiction name appears on all reports, and creating the APWA/Organization Table. These are responsibilities of the Data Processing Agency representative on the project team.

The APWA/Organization Table is a file consisting of three types of records maintaining data on APWA codes, organization codes, and shop facility codes, respectively. These codes enable the system to print out necessary descriptive entries on system reports. APWA codes maintained in this table identify major classes of equipment; only the first two of the eight characters in the code are used. These standard codes and their associated equipment class descriptions are presented in Table 3. Technical specifications and record layout formats for this file can be found on pages 19 and 20 of Appendix A, Program Documentation, Equipment Inventory Module. APWA codes can be transferred directly from the APWA/Organization table on the magnetic tape provided by PTI. Organization and shop facility codes are developed by the jurisdiction and recorded on the Organization Code Form and the Shop (Facilities) Code Form, respectively.

Table 3

MAJOR APWA CLASSES

(Major classes of equipment are identified by the first two characters of the eight

character APWA code:

↓	↓						
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)

CODE	DESCRIPTION	CODE	DESCRIPTION	CODE	DESCRIPTION
1A	Sedan	3R	Mobile Unit	6C	Spec Terr Veh
1B	Station Wagon	3S	Service Truck	8A	Bed Trailer
1C	Jeep	3U	Fire/Rescue	8B	Trl - Van/Dump
1D	Ambulance - CV	3W	Other Trucks	8C	Trl-Mobile Home
1K	Motorcycle	4A	Light Tractor	8D	Tank Trailer
1N	Scooter	4G	Trac-Hvy-Rig	8F	Ref. Trailer
2A	Bus	4N	Trac-Hyv-Art	9A	Asphalt Work
2C	Carryall	4X	Crawler Tract	9B	Cmpct/Convey
2E	Dump Truck	5A	Backhoe	9C	Mixer
2G	Flatbed Truck	5B	Crane	9D	Mudjack
2K	Panel Truck	5C	Loader	9E	Roller - Pneu
2L	Pickup Truck	5D	Shovel	9F	Misc. Paving
2P	Tank Truck	5E	Scraper	9J	Grnd - Mower
2R	Truck Tractor	5K	Landfill/Comp	9K	Shred/Spray
2T	Utility Truck	5L	Grader	9L	Vac Cleaner
2V	Van Truck	5M	Roller/Pneu	9P	Boiler/Cleaner
3A	Ref Comp Frnt	5N	Roller/Steel	9Q	Compressor/Ar
3B	Ref Comp Side	5P	Heater/Planer	9R	Flood Light
3C	Ref Comp Rear	5R	Sweeper	9S	Generator
3D	Ref Comp Art.	5W	Misc Equipment	9T	Lub/Fld Unit
3J	Street Sanit	5X	Misc Equipment	9U	Miscellaneous
3M	Pave. Maint.	6A	Plane		
3P	Trk - Excv/Load	6B	Boat		

Organization and Shop Facility records for the file can be punched on cards directly from the Organization Codes and Shop (Facility) Codes Forms.

TASK 2, Step 4: Begin staff training

The Data Control Clerk has the largest share of responsibility for Equipment Inventory Module processes. Others who may require training are those who will supply the Data Control Clerk with input data. These people may include Finance, Purchasing, User Agency, and shop personnel. They need to understand that effective system operation requires that they promptly inform the Data Control Clerk of any changes in the status of equipment, and that they promptly provide all data needed for the Equipment Inventory Form when new equipment is added to the fleet.

TASK 2, Step 5: Test and validate module processes: finalize reports, forms, procedures, and programs

Equipment Inventory Module processes should be tested using a Master File containing records for about twenty pieces of equipment. Thus, to begin with, inventory data should be collected for twenty pieces of equipment according to the procedure worked out in Step 3 above. For most effective testing, the equipment should be selected from several different agencies. This data should be submitted to the system according to the procedure for ADDING EQUIPMENT TO THE FLEET. The Data Control Clerk should check the resulting reports carefully to ensure correct data has been entered in the Master File. Next, report request processes should be tested and validated. Then the remaining module processes should be tested and validated.

Test all processes.

Keep in mind that processes--not just computer programs--are being tested.

This is an opportunity to work out any bugs in inter-agency communications, data collection procedures, and manual filing systems, as well as to familiarize impacted personnel with system forms, error correction techniques, and output reports.

Processes may be tested several times, during which procedures may be refined. When the project team is satisfied with the processes, the test data and results should be filed.

TASK 2, Step 6: Finalize system documentation

(Refer to the general discussion of Step 6, Section 2.3.6)

TASK 3: INSTITUTE EQUIPMENT INVENTORY MODULE PROCESSES

Staff training should be completed for all personnel who were not involved in testing. Next, the Equipment Inventory Master File must be created; data will have to be collected for all equipment in the fleet, according to the procedure worked out in Task 2, Step 3 (this procedure may have been modified during testing, Task 2, Step 5). The twenty Equipment Inventory Forms completed during testing can be used again at this time. Data should be entered into the system according to the procedure for ADDING EQUIPMENT TO THE FLEET.

Once the Master File has been created, it must be kept up-to-date. Perform all Equipment Inventory Module processes as necessary on a day-to-day basis in order to maintain the file.

TASK 4: PREPARE FOR AND TEST FUEL MODULE PROCESSES

Refer to the general discussion of task steps, Section 2.3.

TASK 4, Step 1: Study module processes in the context of current equipment management functions

The process central to the Fuel Module is DISPENSING FUEL AND OTHER COMMODITIES, which provides the system with data on all fueling operations. This process should be studied carefully, because jurisdictions differ greatly in their fueling operations and in their methods for collecting fueling data. The equipment management system allows for several approaches, examples of which follow:

- Transactions are recorded individually on fuel tickets. Tickets are filled out entirely by hand, or in conjunction with a plastic identification card and card imprinter. The card might contain the equipment number and description along with identification of the assigned agency and possibly an account number. The card imprinter might enter the identification number of the dispensing pump, and the date of the transaction.
- Transactions are recorded sequentially on a form. One form is used for each pump. This approach facilitates the batching of fuel transactions from the source pump.
- Transactions are recorded by automated fuel dispensing and recording equipment. Some types of automated equipment require a plastic identification card inserted into the mechanism; additional data may be entered into the mechanism using thumb dials.

Data listed below must be included in fuel transaction records:

- Pump number;
- Ticket or transaction number;
- Transaction date;
- Equipment number;

- Odometer (or hourmeter) reading; and
- Gallons of fuel.

The following may also be included:

- Quarts of oil;
- Quarts of automatic transmission fluid;
- Quarts of anti-freeze; and
- Quarts of hydraulic fluid.

Note that procedures for Fuel Module processes may require modification to accommodate the local data collection approach.

In addition to studying data collection methods for the process DISPENSING FUEL AND OTHER COMMODITIES, project team members should consider how often raw fuel transaction data will be submitted to the Data Processing Agency. Although the User's Guide recommends daily processing, jurisdictions with small fleets (and a low volume of data) may wish to process the data less frequently. All fueling data for any given reporting period must, of course, be submitted to the system before end-of-month processing begins.

Project team members should also think about timing requirements for another Fuel Module process involving data collection--RECONCILING FUEL TRANSACTION RECORDS AND PUMP READINGS. Pump meter readings should be collected and reconciliation performed on a regular basis, but need not be coordinated with the monthly system cycle. The User's Guide recommends weekly reconciliation, but reconciliation can be performed more or less frequently at the discretion of the jurisdiction.

TASK 4, Step 2: Plan for module operations: adapt reports, forms,
and procedures

Fuel Module reports should not require modification during implementation.

During this step, the project team should determine how fuel transactions will be recorded. Possible approaches and necessary data elements were discussed in Step 1 above. A routine should be established to ensure the timely collection of fuel transaction records from fueling sites. The records should be batched and forwarded to the Data Control Clerk.

The frequency for RECONCILING FUEL TRANSACTION RECORDS AND PUMP READINGS should also be established. Next routines should be developed for obtaining pump readings at the end of each reconciliation period (the Pump Reading Form can be used), and for forwarding these to the Data Control Clerk. Pump readings must be taken after the final transaction on the last day of each reconciliation period.

TASK 4, Step 3: Complete functional and technical preparations

Functional

The equipment management system requires a unique three digit identification number for each pump in the jurisdiction. The first two digits of the fuel pump identification number should indicate the location of the pump. This will facilitate the analysis and interpretation of system reports, particularly the 'Pump Reconciliation Report' and the 'Fuel Transactions by Pump Number' report, which group together all information for one fueling site.

Coding fuel pumps by location also facilitates the organization and storage of raw fuel transaction records. Fuel tickets can be batched by location. When errors

are reported on the 'Fuel Transaction Error Listing' the Data Control Clerk can easily retrieve fuel records for a particular pump, bay of pumps, or fueling site, and locate the fuel transaction in question.

If desired, the first two digits of the fuel pump identification number can indicate a particular bay of pumps at one fueling site, rather than a fueling site that might include several bays. The third digit should identify a specific pump. Thus the number "115" would designate the fifth pump at the eleventh fueling site or bay.

The Equipment Management Office should complete the Fuel Pumps Data Collection Form (Figure 7) and submit it to the Data Processing Agency. This form should list pump identification numbers and the type of fuel dispensed at each pump.

The following code letters must be used to indicate the type of fuel dispensed:

A - Regular

B - Lo-Lead

C - Hi-Test

D - Diesel

E - Kerosene

Once pump identification information is submitted to the system, unit cost figures for each type of fuel dispensed, and for oil, transmission fluid, hydraulic fluid, and anti-freeze must be established so that the costs associated with fuel transactions can be calculated. These unit costs are initially supplied to the system on the Fuel/Commodity Cost Change Form, according to the procedure for CHANGING THE PRICE OF FUEL AND OTHER COMMODITIES.

Unit cost figures entered into the system should be based on the requirements of accounting methods in the jurisdiction. Costing rates can reflect actual cost or

FIGURE 7

PTI/APWA EQUIPMENT MANAGEMENT SYSTEM

Fuel Types

- A - Regular
B - Lo-lead
C - Hi-test
D - Diesel
E - Kerosene

FUEL PUMPS DATA COLLECTION FORM
(Used only during implementation of the fuel module)

[illegible]

current value of fuels and other commodities dispensed at the pump. Jurisdictions may include a profit or overhead factor in their cost figures.

Technical

Technical preparations for the Fuel Module include program modification and creation of the Pump Number Cards file (EMFF04) and the Fuel Cost Cards file (EMFF05).

Program modifications include routine report format changes so that the name of the jurisdiction appears on all reports, as well as substantive changes required to accommodate variations from recommended module forms. The latter changes might include the development of a pre-processor computer program to reformat data for input to regular system programs.

The files are created using the Fuel Pumps Data Collection Form and the Fuel/Commodity Cost Form, respectively. File layout descriptions are provided in Program Documentation for the Fuel Module, Appendix A.

TASK 4, Step 4: Begin staff training

Staff training for Fuel Module operations will involve those responsible for data collection--for recording of fuel transactions and weekly pump meter readings--and those making use of Fuel Module reports and other reports containing fueling information and/or fuel cost information.

It is particularly important to stress the need for accurate fuel transaction data. Whatever method is used to record fuel transactions, responsible personnel (pump attendants or authorized employees) should be provided with clear instructions in order to minimize illegible or incomplete transaction data. High error rates in fuel transaction data can delay report production.

Personnel involved in the use of fueling information, such as billing clerks and Purchasing and Accounting Department employees should be fully briefed on how the Fuel Module works, and on special reports that can be generated on request. The Data Control Clerk should fully understand how to use the 'Fuel Transactions by Pump Number' and 'Fuel Transactions by Equipment Number' reports to trace irregularities in fueling operations.

TASK 4, Step 5: Test and validate module processes: finalize reports, forms, procedures, and programs

Testing of Fuel Module processes cannot begin until the Equipment Inventory Module is fully implemented. Testing should be undertaken at one fueling site, where site employees can be relied on for efficiency and cooperation. When a new Fuel Transaction Form is being tested, site employees will have to complete both the old and the new forms, to ensure continuity.

Collect pump readings at the start of testing. These should be entered in the "beginning reading" column on the Fuel Pump Reading Form.

The main work of testing will be collecting fueling data and supplying it to the system according to the procedure for DISPENSING FUEL AND OTHER COMMODITIES. A new fuel transaction form may prove difficult to fill out, or the Data Processing Agency may find it difficult to work with. In any case, the Project Team should monitor problems that arise in collecting data at the pumps or entering data into the system. Attention should be paid to the 'Fuel Transaction Error Listing,' which indicates errors in the incoming transaction data. Prototype forms should be revised and retested until proven compatible with fueling and system operations.

Pump meter readings should be collected at the end of a reconciliation period

(usually one week) and the procedure for RECONCILING FUEL TRANSACTIONS AND PUMP READINGS performed. The 'Pump Reconciliation Report' can help to identify pumps at which there is difficulty collecting legible, valid fuel transaction data; problem pumps will show a discrepancy between the number of gallons reported on fuel transaction records, and the number of gallons dispensed according to the pump readings.

After reconciliation has been performed, other module processes can be tested. Make sure that at the conclusion of testing, the system maintains the proper fuel and commodity costs, which may have been altered during testing of the process CHANGING THE PRICE OF FUEL AND OTHER COMMODITIES.

Note that Fuel Module processes are not permanently instituted until after Task 6, Testing of Integrated Operations.

TASK 4, Step 6: Finalize system documentation

(Refer to the general discussion of Step 6, Section 2.3.6.)

TASK 5: PREPARE FOR AND TEST REPAIR MODULE PROCESSES

Refer to the general discussion of task steps, Section 2.3.

TASK 5, Step 1: Study module processes in the context of current equipment management functions

The process REPAIRING EQUIPMENT, in which repair data is collected and processed, requires special attention. Both the recommended Repair Order Form and the procedure for REPAIRING EQUIPMENT should be examined carefully, to determine their local suitability, and the extent of modifications needed.

The equipment management system requires, and the recommended Repair Order Form provides for the collection of the following critical data:

- Equipment number;
- Repair order number;
- Shop facility code;
- Odometer (or hourmeter) reading;
- Work class (scheduled, unscheduled, or emergency);
- Billing instructions;
- Reason brought in;
- Repair types;
- Operating time lost;
- Labor hours;
- Parts costs; and
- Commercial costs.

Some jurisdictions use separate forms to record parts data, labor hours, and/or commercial costs. This approach is acceptable, but system program modifications may be required to accommodate a changed format. Some jurisdictions remove the repair type codes from the form in order to save space, in such instances repair types and corresponding codes should be conveniently available to those completing the form.

The procedure for REPAIRING EQUIPMENT, described in the User's Guide, assumes the availability of a professional service writer who enters on each repair order all data except that which a mechanic or parts man supplies. If this is not the case, the procedure may require modification.

TASK 5, Step 2: Plan for module operations; adapt reports, forms, and procedures

Repair Module reports should not require modification during implementation. Only the Repair Order Form may require modifications. All necessary data elements must be included, regardless of format. Computer program modifications may be called for.

In tailoring the procedure for REPAIRING EQUIPMENT to local requirements, the project team should work out a routine for the "closing out" of repair orders at the end of each reporting period. For incomplete repairs, service writers must fill out a new Repair Order Form, using the old repair order number (the number on the form that was "closed out"), and indicating a continuation.

TASK 5, Step 3: Complete functional and technical preparations

Functional

Functional preparations for the Repair Module include setting initial shop

employee labor rates and compiling data on the normal operating schedules of fleet equipment.

Initial shop employee labor rates should be filled in on the Employee Rate Setting Form. An employee identification number of up to nine digits should be entered for each mechanic who will report labor hours on the repair orders. The project team can set a flat hourly rate for all shop employees, or set rates for individual mechanics. Each rate can include a mark-up to cover overhead costs, or the system can be instructed to mark up all specified rates by a fixed percentage. The system uses these rates in costing out labor hours reported on repair orders. Resulting labor cost figures are used in cost accounting, and sometimes in interdepartmental billing.

Once shop employee labor rates are set, the project team must prepare an Equipment Utilization Table listing the normal operating schedules of fleet equipment. This information is used in completing the Repair Order Form, to calculate operating time lost while equipment is in the shop for repairs, maintenance, or inspection. The "Operating Time Lost" field on the Repair Order Form corresponds to the "Downtime" field on system reports, indicating the amount of time equipment is unavailable for service during normal operating hours. Thus if a piece of equipment is repaired over a weekend when it wouldn't normally be in service, no lost operating time is reported to the system. Each month the system calculates "average percent downtime" for each piece of equipment (this field is included in the 'Fleet Summary Report'), on the basis of operating time lost and total available operating hours per month. The latter figure is entered into the system from the Equipment Inventory Form.

The Equipment Utilization Table should indicate normal operating days and hours for each piece of equipment (e.g., Monday-Friday, 8-5). Total weekly operating

hours should be consistent with the figure for total available operating hours per month entered on the Equipment Inventory Form. The data in the Equipment Utilization Table must be kept up-to-date.

Technical

Technical preparations for the Repair Module include several program modifications and the creation of one file. First, programs must be modified so that the name of the jurisdiction is printed at the top of each page of module reports. Next, the last month of the annual system cycle must be indicated in several programs, so that historical files can be properly maintained. Enter the appropriate number (01 = January, 12 = December) after "VALUE" in the following programs:

- Shop Performance Report Generator (EMRP11)
Data Division (Working Storage):
Level 01 CONSTANT-AREA
Level 05 NEW YEAR VALUE ____.
- Shop Performance Analysis By Type
of Repair Report Generator
Data Division (Working Storage):
Level 01 CHANGE-YEAR VALUE ____.
- Cause of Repair Report (EMRP13)
Data Division (Working Storage):
Level 01 CNTR-AREA
Level 05 CHANGE-YEAR VALUE ____.

If a flat rate for all shop employees (shop-rate) is to be substituted for individual rates, the following modifications should be made to the Repair Order Edit Program (EMRP01).

1. Environment Division:

Remove the SELECT and FD Statements for the
LABOR-RATE-FILE

2. Data Division:

Remove the EMPLOYEE-RATE TABLE.

3. Procedure Division:

a) Remove the OPEN statement for the LABOR-RATE-FILE from paragraph III-ON.

b) In addition, remove the following paragraphs.

Paragraph Name

112 -BUILD-EMPLOYEE-RATE-FILE

113 -ERR-RTN-EMPL-BUILD

114 -FINISH-EMPL-BUILD

115 -TERMINATE-RUN

120 -NOTE

121 -SORT-EMPL-TABLE

122 -SEQUENCING-RTN-EXIT

123 -NOTE

125 -FINISH-INITIALIZING

126 -PRINT-EMPL-CARD-TOTALS

c) Eliminate table look-up from paragraph 411 -FIND-EMPLOYEE-IN-RATE-TBL

d) Paragraph 414 -CALC-LABOR-AMOUNT
Replace employee rate from table by flat rate, to be charged for all employees

Following program modifications, the Employee Rate file should be created, using data gathered on the Employee Rate Setting Form. The file description and record layout is contained in Program Documentation for the Repair Module, Appendix A.

TASK 5, Step 4: Begin staff training

Staff training for Repair Module operations will involve those responsible for collecting and recording repair data, and those who receive and use Repair Module reports. These include shop foremen, shop supervisors, service writers, mechanics, parts men, and shop clerical workers. Accounting and Using Agency personnel who work with repair information may also be included in training, so they gain an understanding of relevant system processes.

It is particularly important to stress the need for accurate repair transaction data. Whatever method is used to record repair data, responsible personnel should be provided with clear instructions in order to minimize illegible or incomplete data on repair orders. High error rates in repair transaction data can delay report production.

Where appropriate, shop unions should be informed of any changes that result from introduction of the system. Union cooperation is critical.

TASK 5, Step 5: Test and validate module processes; finalize reports, forms, procedures, and programs

Testing of Repair Module processes cannot begin until the Equipment Inventory Module is fully implemented. Preferably, testing should be undertaken at one repair shop, hopefully one involved in a full range of shop operations. When a new Repair Order Form is being tested, site employees will have to complete both the old and the new forms, to ensure continuity.

Begin collecting repair data and supplying it to the system according to the procedure for REPAIRING EQUIPMENT. Data should be collected for several weeks,

after which data processing personnel should run month-end module job streams generating the 'Shop Performance Report,' the 'Shop Performance Analysis by Type of Repair' report, and the 'Cause of Repair Report.' These reports normally contain historical information; however, at this time information will appear only in "this period" fields. The process REQUESTING THE 'MAINTENANCE AND REPAIR ACTIVITY LISTING,' should be performed to request information first for selected vehicles, and then for all vehicles, for various time intervals in the testing period.

Note that Repair Module processes are not permanently instituted until after Task 6, Testing of Integrated Operations).

TASK 5, Step 6: Finalize system documentation

(Refer to the general discussion of Step 6, Section 2.3.6.)

TASK 6: PERFORM INTEGRATED TESTING OF EQUIPMENT INVENTORY, FUEL, AND REPAIR MODULES

Integrated testing of the Equipment Inventory, Fuel, and Repair Modules involves updating the Equipment Inventory Master File with Fuel and Repair Module test data. This requires collection of one full month of fuel and repair data at the original test sites subsequent to the successful completion of testing of the Fuel and Repair Module processes. It also involves partial testing of the General Module process, CLOSING OUT A MONTHLY REPORTING PERIOD.

TASK 6, Step 1: Review relevant processes

Relevant processes include DISPENSING FUEL AND OTHER COMMODITIES (Fuel Module), REPAIRING EQUIPMENT (Repair Module), along with CLOSING OUT A MONTHLY REPORTING PERIOD. At the end of the designated test month, all fuel transactions and repair orders must be "closed out" and processed according to procedures worked out in Tasks 4 and 5. In CLOSING OUT A MONTHLY REPORTING PERIOD, the Month-End Data Form is partially completed, and the 'Master File Update Error Listing' generated. Comprehensive reports associated with this process are not generated until full implementation of the General Module.

TASK 6, Step 2: Plan for testing

The process CLOSING OUT A MONTHLY REPORTING PERIOD critically affects timing of the production of month-end reports. Close-out procedures must work smoothly; all Fuel Transaction and Repair Order Forms for the monthly reporting period must be promptly routed to the Data Control Clerk. The Data Control Clerk, in turn, must expedite the correction of errors indicated on the 'Fuel Transaction Error Listing,'

the 'Repair Order Transaction Error Listing,' and on the 'Master File Update Error Listing.' Go over close-out and error correction procedures carefully, to minimize problems during testing.

TASK 6, Step 3: Complete technical preparations

Data processing personnel must create the Insurance Cost Cards File (EMGF24). This file enables the system, during the monthly update, to calculate monthly insurance costs for equipment. Data for the file is collected on the Insurance Cost Codes Form, completed during Task I, "Preparation for and testing of Equipment Inventory Module processes." Refer to the file description and record layout instructions in Program Documentation for the General Module, Volume I, pages A.2-1, A.2-2.

TASK 6, Step 4: Brief affected personnel

Those personnel involved in the three processes performed during integrated testing should be reminded of their responsibilities, and of the time-critical nature of these responsibilities. Again, these personnel include the Data Control Clerk, and fueling and repair shop personnel at testing sites.

TASK 6, Step 5: Commence testing and validate test results

Collect fuel and repair data for one reporting period at the original Fuel and Repair Module testing sites. Follow the procedures for DISPENSING FUEL AND OTHER COMMODITIES and REPAIRING EQUIPMENT. At the end of this period, follow the procedure for CLOSING OUT A MONTHLY REPORTING PERIOD. In filling out the Month-End Data Form, complete field #1 ("Period Ending Date") and field #6 ("Test Shop Identification Code and Number of Employees").

The Data Processing Agency runs three of the six job streams normally associated with CLOSING OUT A MONTHLY REPORTING PERIOD. (Job streams generating comprehensive reports are not run.) After all fuel and repair data has been submitted and processed, data processing personnel should run the Fuel Module Monthly Consolidation and Delete job stream (EMFJ03) and the Repair Module History Update job stream (EMFR02). These job streams generate a consolidated Fuel File (EMFF14) and a Month-to-Date Repair File (EMRF07), respectively. These files are used in the Inventory File Update job stream (EMGJ01).

Before running the Inventory File Update job stream, data processing personnel should duplicate the current Master File for testing. Run the job stream using this duplicate file, generating the 'Master File Update Error Listing' (EMGR06), and trace and correct any identified errors.

In order to determine whether the Master File has been properly updated, reports using information from the updated file must be requested. Request the 'Equipment Inventory Detail Report' for all equipment; request both the 'Fuel Transactions by Equipment Number' report and the 'Maintenance and Repair Activity Listing' for all equipment, and for the time interval of the test month.

For each piece of equipment, check the following fields on the 'Equipment Inventory Detail Report' (reflecting the contents of the updated Master File) against corresponding fields on the 'Fuel Transactions by Equipment Number' report:

'Equipment Detail Inventory Report'	'Fuel Transactions by Equipment Number' Report
"Fuel Gallons Current Month"	"Fuel Gallons"
"Fuel Cost Current Month"	"Fuel Cost"
"Oil Quarts Current Month"	"Quarts of Oil"
"Oil Miscellaneous Cost Current Month"	"Oil Cost Plus Miscellaneous Cost"
"Miles (Hours) Current Month"	"Miles/Hours Traveled"

For each piece of equipment, check the following fields on the 'Equipment Inventory Detail Report' against the corresponding fields on the 'Maintenance and Repair Activity Listing':

'Equipment Inventory Detail Report'	'Maintenance and Repair Activity Listing'
"Repair Orders Current Month"	(Total number of repair orders listed)
"Labor Hours Current Month"	"Labor Hours Current Month"
"Labor Dollars Current Month"	"Labor Cost Current Month"
"Parts Dollars Current Month"	"Parts Cost Current Month"
"Commercial Dollars Current Month"	"Commercial Costs Current Month"

The project team should analyze any discrepancies identified and take remedial action. Any necessary procedural or program modifications should be made and documented. When testing is successfully concluded, all testing materials--including all files and reports--should be filed along with a test log.

TASK 7: INSTITUTE FUEL MODULE PROCESSES

Once integrated testing is successfully concluded, the collection of fueling data for the system can begin throughout the jurisdiction. The process DISPENSING FUEL AND OTHER COMMODITIES should be instituted at one fueling site at a time. At any given fueling site, collection of pump readings must immediately precede initiation of the process. These pump readings should be entered in the "Beginning Reading" column on the Fuel Pump Reading Form.

Institute all other Fuel Module processes. Present manual or automated fuel data collection systems should be maintained until the Fuel Module is fully operational.

Project team members should note that when the process DISPENSING FUEL AND OTHER COMMODITIES is first instituted, as many as 10% of all Fuel Transaction Forms may contain erroneous data. With experience, the error rate should drop to 1-3%.

TASK 8: INSTITUTE REPAIR MODULE PROCESSES

Repair Module processes can be instituted along with Fuel Module processes after the conclusion of integrated testing. The process REPAIRING EQUIPMENT should be instituted at one repair shop at a time, starting with those shops where implementation is most easily accomplished. All other Repair Module processes should be instituted as well.

TASK 9: BEGIN INTEGRATED OPERATIONS OF THE EQUIPMENT
INVENTORY, FUEL, AND REPAIR MODULES

When the Fuel and Repair Modules are fully operational, and fuel and repair data collection processes instituted throughout the jurisdiction, integrated operations can begin. The process CLOSING OUT A MONTHLY REPORTING PERIOD should be partially instituted as described in Task 6. When the General Module is implemented, the complete process CLOSING OUT A MONTHLY REPORTING PERIOD is instituted--all fields on the Month-End Data Form are filled in, and comprehensive reports generated.

With the onset of integrated operations, work of the Data Control Clerk and the Data Processing Agency requires careful coordination. Correction of data errors submitted through the three operational modules must be expedited to minimize lag time between the reporting period cut-off date and production of month-end reports.

TASK 10: PREPARE FOR AND TEST BILLING MODULE PROCESSES

Refer to the general discussion of task steps, Section 2.3.

TASK 10, Step 1: Study module processes in the context of current equipment management operations

In reviewing the process USING MOTOR POOL EQUIPMENT, the project team should consider the suitability of the recommended Motor Pool Ticket. The form may be modified, depending on how a jurisdiction calculates charges for the use of pool equipment. For example, if charges are calculated strictly on the basis of time in use (days and/or clock hours), the meter fields included on the form may be unnecessary.

The process COLLECTING MONTHLY METER READINGS, involving completion of the 'Monthly Meter Report'/Form, must be implemented if any equipment operated by the jurisdiction is billed on a rental basis. The project team should decide whether monthly meter readings will be collected just for rental equipment, or for all fleet equipment. Collection of meter readings for all equipment enhances the accuracy of system reporting.

The project team should consider the best way to collect data for the 'Monthly Meter Report'/Form. For example, drivers may be instructed to record their mileage on an in-house form collected monthly, or one person in each using agency may go through the agency parking lot to collect all meter readings at the end of each month.

With regard to the process BILLING FOR THE USE OF EQUIPMENT, the project team should examine the 'Departmental Billing--Direct and Rental Charges' report, to determine how the billing information contained therein will support local billing practices.

TASK 10, Step 2: Plan for module operations; adapt reports, forms,
and procedures

The only Billing Module form that might require modification is the Pool Ticket. As discussed in the previous step, modifications would reflect local practices in charging for pool equipment use. Computer program modifications will not be necessary.

In tailoring the procedure for USING MOTOR POOL EQUIPMENT to local requirements, the project team should develop a "close-out" procedure to ensure that all Motor Pool Tickets remaining in the motor pool office at the end of a reporting period are promptly forwarded to the Data Control Clerk. Similarly, with regard to the procedure for COLLECTING MONTHLY METER READINGS, the project team should establish a procedure to ensure that the 'Monthly Meter Report'/Forms are promptly completed by using agencies and submitted to the Data Control Clerk.

TASK 10, Step 3: Complete functional and technical preparations

Functional

Billing Module implementation entails no functional preparations.

Technical

Technical preparations include modifying programs to print the name of the jurisdiction at the top of each report, and adapting the 'Monthly Meter Report'/Form Generator Program (EMBP03) to accommodate the local monthly billing cycle. If the billing cycle does not begin on the first day of each month, modify the Generator Program as follows:

(Division)	Procedure Division
(Paragraph)	200-START-PROCESS
(Statement)	MOVE <u>01</u> to TODAYS-DAY (change <u>01</u> to the proper beginning billing cycle day of the month)

TASK 10, Step 4: Begin staff training

Staff training for the Billing Module will involve those responsible for collecting and recording data on module input forms, and those who will receive and use module reports. Appropriate clerical personnel in agencies using fleet equipment should be instructed in how and when to complete the 'Monthly Meter Report'/Form. Those who complete Motor Pool Tickets---either drivers or motor pool attendants---should be instructed in the proper completion of this form. Accounting personnel and clerical personnel in both the Equipment Management Office and equipment-using agencies should be briefed on the content of the new billing reports, and their use.

TASK 10, Step 5: Test and validate module processes; finalize reports, forms, procedures, and programs

Each process should be tested on a limited basis. The process USING MOTOR POOL EQUIPMENT should be tested for 10-20 vehicles in the pool. Depending on the format of the Pool Ticket being tested, motor pool employees may have to complete both the old and the new tickets for test vehicles, in order to support any on-going recordkeeping system. The processes COLLECTING MONTHLY METER READINGS and BILLING FOR THE USE OF EQUIPMENT should be tested in one organization (e.g., Public Works).

Testing of Billing Module processes should commence only after one full month of integrated operations of the Equipment Inventory, Fuel, and Repair Modules. Processes must be tested for one full reporting period. During routine month-end processing, generate the 'Monthly Meter Report'/Form (using the 'Monthly Meter Report'/Form Generator program (EMBP03)) and forward the appropriate section of the report/form to the organization involved in testing.

Collect and process motor pool use data throughout the test period, according to the procedure for USING MOTOR POOL EQUIPMENT. At the end of the period, collect meter readings on the report/forms according to the procedure for COLLECTING MONTHLY METER READINGS, and generate the 'Departmental Billing--Direct and Rental Charges' report.

Before testing the process BILLING FOR THE USE OF EQUIPMENT, validate the 'Departmental Billing' report. Rental charges listed on the report can be validated by manual calculations using data recorded on the Pool Tickets and the 'Monthly Meter Report'/Form. To validate direct charges, generate the 'Maintenance and Repair Activity Listing' and the 'Fuel Transactions by Equipment Number' report and compare charges shown on the Billing report with costs shown on these Fuel and Repair Module reports.

TASK 10, Step 6: Finalize system documentation

(Refer to the general discussion, Section 2.3.6.)

TASK 11: INSTITUTE BILLING MODULE PROCESSES

Staff training should be completed for all affected personnel who were not involved in testing. Then the process COLLECTING MONTHLY METER READINGS should be introduced in all organizations using fleet equipment. Remaining module processes should be fully implemented.

TASK 12: PREPARE FOR AND TEST PREVENTIVE MAINTENANCE MODULE PROCESSES

Refer to the general discussion of task steps, Section 2.3.

TASK 12, Step 1: Study module processes in the context of current equipment management functions

Preventive Maintenance (PM) data is most easily collected on the Repair Order Form. PM data may be recorded on a separate form, with a format similar to that of the Repair Order Form. In either case, the procedure for REPAIRING EQUIPMENT is followed for collecting and processing the data.

In reviewing the process SCHEDULING PREVENTIVE MAINTENANCE OR STATE INSPECTIONS, project team members should give special attention to two aspects of the process. First, they should think about the logistics of PM scheduling: Who will be responsible for scheduling, and how will shop personnel interact with personnel in using agencies when scheduling equipment? Second, they should consider who should be responsible for monitoring monthly PM activities in each shop. Monitoring is necessary to keep track of equipment serviced after the closing date for the reporting period and before new reports are received in the shop, since such equipment will be listed on the new report as due (or overdue) for service. Completion dates for PM or inspection work must be entered on PM scheduling lists so shop personnel will be aware of work performed after the closing date of a reporting period. Otherwise, equipment may be mistakenly rescheduled for PM.

TASK 12, Step 2: Plan for module operations; adapt reports, forms, and procedures

A separate form may be designed for recording PM and State Inspection data.

The Repair Order Form format should be followed, but many "Reason Brought In" and "Repair Type" fields can be eliminated.

As part of the procedure for SCHEDULING PREVENTIVE MAINTENANCE AND STATE INSPECTIONS, the project team should devise routines for the interaction of repair shop and using agency personnel, and for the monitoring of PM and inspection work in each repair shop. With regard to the former, effective PM scheduling requires the cooperation of shop and agency personnel in determining the best times for servicing equipment. In order to monitor PM work in each shop, one person (e.g., a service writer, or the PM foreman) should be responsible for recording the completion date of each PM and inspection in the space provided on the PM scheduling list, and for reviewing new scheduling lists. New scheduling lists must be checked against the old; any equipment appearing on the new list that has already been serviced should be crossed off the new list.

TASK 12, Step 3: Complete functional and technical preparations

Functional

The Preventive Maintenance Module uses initial PM or inspection work reported to the system as a reference point for scheduling subsequent PM's for each piece of equipment. Until an initial PM is reported to the system, equipment is listed as overdue for PM on the monthly 'Preventive Maintenance Scheduling' report.

Prior to implementation of the Preventive Maintenance Module, PM's and inspections should be scheduled manually. As soon as the Repair Module is fully operational (before the PM module is tested), PM and inspection work should be routinely reported along with other maintenance and repair work on the Repair Order Form.

The system will take over PM scheduling for individual pieces of equipment as initial PM and inspection work is reported.

Technical

Modify programs so that report headings show the proper jurisdiction name.

TASK 12, Step 4: Begin staff training

Personnel affected by the Preventive Maintenance Module include shop PM foremen and using agency employees with equipment assignment responsibilities. They should be informed about how the system supports PM scheduling, and should become familiar with the scheduling reports and their use. Procedures for SCHEDULING PREVENTIVE MAINTENANCE AND STATE INSPECTIONS, as they will be instituted locally, should be reviewed carefully.

TASK 12, Step 5: Test and validate module processes, finalize reports, forms, procedures, and programs

The only process to be tested here is SCHEDULING EQUIPMENT FOR PREVENTIVE MAINTENANCE AND STATE INSPECTION, since the procedure for PERFORMING PREVENTIVE MAINTENANCE AND STATE INSPECTIONS is the same as that for REPAIRING EQUIPMENT, tested in Task 5. During the month-end processing preceding testing, the Data Processing Agency should run the PM Extract and Scheduling Report job stream (EMMJ01), using the most current Master File, to produce the 'Preventive Maintenance Scheduling Report.' When an initial PM or inspection for some equipment has not yet been reported to the system, that equipment will be listed as overdue for PM (or inspection) and zeroes will appear in the "Date Last PM" and "Meter Reading Last PM" fields.

The PM scheduling process should be tested in one shop. Follow the procedure for SCHEDULING PREVENTIVE MAINTENANCE OR STATE INSPECTIONS.

TASK 12, Step 6: Finalize system documentation.

(Refer to the general discussion, Section 2.3.6.)

TASK 13: INSTITUTE PREVENTIVE MAINTENANCE

The PM module can be implemented any time after successful testing by disseminating the scheduling reports to all shops, and instituting the scheduling process in each.

TASK 14: PREPARE FOR AND TEST GENERAL MODULE PROCESSES

Refer to the general discussion of task steps, Section 2.3.

TASK 14, Step 1: Study module processes in the context of current equipment management operations

In this task, preparations are made to fully implement the process CLOSING OUT A MONTHLY REPORTING PERIOD so comprehensive reports can be produced monthly. This entails completion of all fields on the Month-End Data Form at the end of each month, and setting initial exception condition limits so the system can generate the 'Equipment Exception Condition Report.'

The process SETTING EXCEPTION CONDITION LIMITS is tested when limits are initially set. The Equipment Manager, together with the rest of the project team, ought to study recent system reports in order to determine realistic exception condition limits.

ALTERING INCORRECT SYSTEM DATA is a self-explanatory process that is usually tested long before the project team begins this task. However, the Data Processing Agency may not yet have tested the Master File Maintenance Program (EMGP07) with live data. This program is used to change, add, or delete data in those fields on the Master File that cannot be accessed by routine processes.

TASK 14, Step 2: Plan for module operations; adapt reports, forms, and procedures

Modification of reports should be avoided if possible during implementation. The format of the Month-End Data Form can be changed as long as all necessary data is collected.

TASK 14, Step 3: Complete functional and technical preparations

Functional

The Equipment Manager should determine the exception condition limits he or she wishes to establish on the basis of information from available system reports. These limits should be reviewed with the project team.

Technical

General Module programs should be modified so the proper jurisdiction name appears on reports. Report history files (EMGF09 and EMGF11) should be initialized according to the instructions in Testing Procedures.

TASK 14, Step 4: Begin staff training

Management personnel in using organizations, in the chief administrator's office, and in the office of the department head responsible for equipment management should be briefed on the contents and use of comprehensive reports.

TASK 14, Step 5: Test and validate module processes; finalize reports, forms, procedures, and programs

To properly test the General Module, the Equipment Inventory, Fuel, Repair, and Billing Modules must be fully operational.

To test the process SETTING EXCEPTION CONDITION LIMITS, complete the Exception Condition Limits Form and submit it to the Data Processing Agency prior to CLOSING OUT A MONTHLY REPORTING PERIOD. When the latter process is performed, all comprehensive reports, including the 'Equipment Exception Condition Report' will be generated, and can be validated against other system reports.

The process ALTERING INCORRECT SYSTEM DATA can be validated by requesting the 'Equipment Inventory Detail' Report and checking altered data fields.

TASK 14, Step 6: Finalize system documentation

(Refer to the general discussion, Section 2.3.6.)

TASK 15: INSTITUTE GENERAL MODULE PROCESSES

General Module processes can be instituted as soon as the project team is satisfied that the valid comprehensive reports are being generated.