MAINTENANCE OPERATIONS RESOURCES INFORMATION SYSTEMS (MORIS)

Ronald D. Doemland, *Pennsylvania Department of Transportation*, and James A. Goodchild, *KPMG Peat Marwick*

During the 1970s, the Pennsylvania Department of Transportation (PennDOT) developed a Maintenance Management System, an Inventory Management System and an Equipment Management System. While these three systems interfaced with the Accounting system, there was little integration among the three systems. In the early 1980s, PennDOT began to develop MORIS - Maintenance Operations and Resources Information System. MORIS was fully implemented on July 1, 1986, and consisted of three fully integrated sub-systems - Highway, Equipment and Materials. MORIS has provided the Department the capability of planning, monitoring and controlling maintenance operations and resources.

Some of the major benefits PennDOT has realized since the implementation of MORIS have been:

- Reduced clerical effort
- Increased accuracy and reliability of maintenance data
- Improved control over inventory
- Accurate forecasts of material needs
- Improved resource planning
- Lower equipment obsolescence costs
- Better operating cost control

Just a few of the key features associated with MORIS include:

- Annual planning integrated with analysis of pavement condition
- Resource balancing
- Single source for all input
  - Payroll and Production Data from the same document
  - All activity (equipment, material and labor) recorded by the same person.
- Preprinted payroll documents
- Mechanized garage work orders
- Equipment retirement analysis
- Mechanic performance analysis

The Equipment subsystem of MORIS tracks the history of all equipment from acquisition through disposition, as well as monitoring the equipment performance during its life. While the Equipment subsystem contains many features, three of the key features are the Garage Repair, Equipment Scheduling, and Accounting Modules.

- The Garage Repair Module maintains the history of the equipment and provides the garage manager the repair needs while allowing him to generate the repair work order that he wishes while the preventive maintenance work order is automatically generated by the system.
- The Equipment Scheduling Module tracks equipment use, reserves equipment for use and maintains usage standards. Equipment is automatically scheduled for preventive maintenance and fleet assignments are tracked.
- The Accounting Module records equipment purchase costs and maintains depreciation schedules. All usage, repair and operational costs are maintained and passed to the Financial System.

The key feature of the Highway subsystem is the Planning and Scheduling Module. The first step in the planning and scheduling process is to input the information from the road condition survey conducted by each Assistant County Manager. As each deficiency is input, the systems know the route number and the maintenance activity number that will eventually be used to document the completed work. This process continues as the Assistant Manager surveys his roads and builds an inventory of work to be completed.

The next step of the Planning process is to develop the Period Plan (4 months). The Manager, on line, selects the work from his inventory he would like to accomplish in the period. The system then selects the work items by activity and state route. Total crew days planned for each foreman is calculated. Our guideline is to include enough work on the Period Plan to account for at least 70% of the crew days available. Inclement weather and emergencies account for the remaining 30% of the plan.

The next step in the planning process is for the Assistant County Manager to develop his weekly plan. By reviewing his period plan, he selects one or two activities per day, per crew. The system will then generate a preprinted daily payroll for each day of the next week as well as a weekly plan summary for each foreman. The foreman now knows what to do the following week and has his payrolls that contain much of the coding preprinted by the system. After the work is

accomplished, production hours and production units are data entered.

The key to successful development of MORIS can be attributed to the following:

- Field involvement in the requirements, definition and conceptual design phases of the project.

- Constant communication with the field personnel and presentations to field managers during the two years of development.

- Establishment of a team of Department employees and KPMG Peat Marwick representatives to develop and implement the system.