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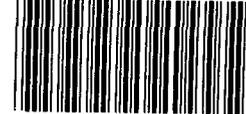


UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

DIVISION OF FINANCIAL AND
GENERAL MANAGEMENT STUDIES

JANUARY 11, 1980

B-196862



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The Honorable Neil E. Goldschmidt
The Secretary of Transportation

Dear Mr. Secretary:

Subject: [Federal Highway Administration Project to
Redesign Its Accounts System to Eliminate
Inefficient Uses of Computers and People]
(FGMSD-80-22)

As it currently exists, the Federal Highway Administration's Accounts System consists of overlapping manual and automated processing steps. The degree of overlap is such that the agency maintains essentially duplicate systems to account for its trust and operating funds. The agency can reduce operating costs for the system by redesigning it to eliminate redundant processing steps and to use modern data entry and retrieval methods.

The manual system consists of cash disbursement and receipt registers and general and allotment ledgers. Summary information is posted to these records. The automated system consists of detailed records that support the manual records.

We could not determine the cost of operating overlapping systems. However, the approximately \$1.2 million spent in 1977 to run the Accounts System gives some idea of the amount of money involved in operating the system and indicates that cost savings by eliminating the overlap could be substantial.

The agency's Headquarters Finance Division has (1) resisted redesign to eliminate the redundant steps and (2) continued to rely on the manual system to meet financial reporting requirements to the Department of the Treasury and the Office of Management and Budget because monthend computer-produced reports are consistently received after the due dates for external reports. One computer report is used to update manual records. The computer produces monthend financial reports late because (1) outdated and inefficient data entry and retrieval methods are used, (2) inefficient methods are used to identify and correct coding and keypunch errors, and (3) the computers are old and often break down.

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*Documentation
Financial records
Cost center
Fin man
Personnel (901300)
management
Federal agency
accounting
automated
Computer info
system*

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Regional offices maintain manual accounting systems and do not extensively use computer reports because one computer report they receive does not present information needed to prepare monthend reports to Treasury. It simply lists information the regions sent to Headquarters for posting to the automated records. The other report that regions receive is used to help prepare yearly budget submissions.

Your Department is working with the General Services Administration to obtain new computers. This should solve the breakdown problems. However, the Federal Highway Administration has only recently taken steps to initiate a systems project to redesign the Accounts System to take advantage of modern methods of data entry and retrieval and of detecting and correcting errors, as was recommended by the Federal Highway Administration task force in 1976.

The task force reported that the agency's accounting and administrative computer systems needed to be redesigned to eliminate overlap and to take advantage of modern data entry and retrieval methods. The task force recommended the design of an agencywide management information system built around a central data base that Headquarters and the regions could access via computer terminals.

If the system is not redesigned, it will use the increased processing capabilities and speeds of the new computers your Department plans to acquire inefficiently. Therefore, we are recommending that you direct the Administrator of the Federal Highway Administration to begin redesigning the system with the objectives of (1) automating the general ledger and (2) using modern data entry and retrieval methods.

The system should be redesigned before the new computers are acquired to make sure that (1) the proper equipment is acquired and (2) the redesigned system is designed, built, tested, and ready for implementation when the new computers are installed. The new system should conform to the accounting principles and standards prescribed by the Comptroller General and should be submitted to him for approval, as required by the Budget and Accounting Act of 1950.

Enclosure I includes further details on our findings and recommendations.

We discussed this report with members of your staff and Federal Highway Administration officials. They agreed with our recommendations and said that a project has been undertaken to redesign the administrative and financial information systems. The proposed Management and Fiscal Information System

will use modern computer data entry and retrieval methods. If designed and implemented as described, it should solve the problems we identified with the present Accounts System.

As you know, Section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Chairmen, House Committee on Government Operations and Senate Committee on Governmental Affairs; the Director, Office of Management and Budget; and the Secretary of the Treasury.

We wish to express our appreciation for the cooperation received during this review. If you desire further information concerning our findings, we would be happy to meet with you or your staff.

Sincerely yours,

Donald

D. L. Scantlebury
Director

Enclosure

FG-MSD

GAO FINDINGS AND RECOMMENDATIONS
ON IMPROVING FINANCIAL REPORTING

The Federal Highway Administration monitors States' use of Federal grant funds to construct new and upgrade existing highways. It reviews and approves State proposals for road construction projects. States provide funds to get approved projects started and then bill the Federal Highway Administration for the Federal Government's share of costs incurred.

The Federal Highway Administration consists of (1) a Washington, D.C., headquarters, (2) 10 regions, and (3) 50 divisions--usually 1 office in each State capitol. The divisions are the primary liaisons between the States' highway departments and the Federal Highway Administration.

States send these bills--usually in the form of computer punched cards--to the divisions, which in turn send them to the regions. The regions review them and enter the information into their accounting systems. The regions forward bills to the Headquarters Finance Division for final review and posting to the central accounting system. The regions keep manual accounting records for the construction grants they manage and their own operating costs. They also prepare and send a monthend report to Treasury. Financial information they send to the Headquarters Finance Division is consolidated there for preparation of a monthend report for the Office of Management and Budget.

The Finance Division runs the agencywide Accounts System, which includes control accounts for grant funds managed by the regions and detailed fund, obligation, expenditure, and cost accounts for appropriated funds managed by Headquarters. The Division prepares and sends the monthly report to Treasury on the status of appropriated funds managed and controlled by Headquarters. It also prepares and sends a consolidated agencywide monthly financial report to the Office of Management and Budget.

SCOPE OF WORK

We traced the flow of information through the manual and automated portions of the Accounts System from source documents to machine and manually prepared reports. We interviewed users of computer-produced reports to determine (1) their purposes, (2) how they are used, and (3) how they contribute to control over public funds and other resources

and managerial decisions on how best to use funds and other resources to achieve program goals. We visited the Federal Highway Administration's Region III (Baltimore); its State office in Washington, D.C.; its Headquarters Finance Division; and the Department of Transportation's Transportation Computer Center.

THE ACCOUNTS SYSTEM USES PEOPLE AND
COMPUTERS INEFFICIENTLY AND INEFFECTIVELY

The Federal Highway Administration uses people and computers inefficiently and ineffectively to account for its trust and operating funds. The manual and automated processes of its Accounts System overlap. The overlap exists because the agency's Finance Division and regions rely on the manual systems to meet both internal and external financial reporting requirements. The automated system only augments the manual system. For example, the Division uses one major computer-produced report to update manually kept records. The regions reconcile one computer-produced report they receive from the Accounts System with information in their manual records to assure that information sent to Headquarters was properly posted to the automated records. The other computer-produced report that regions receive is used to help prepare yearly budget submissions. Other computer reports are used to answer specific, one-time requests for financial information.

The Division does not rely more on the automated system because computer summaries it receives are not delivered in time to meet monthend financial reporting requirements to Treasury and the Office of Management and Budget. Consequently, the Division has insisted on keeping the extensive overlap and relies on the manual system to satisfy financial reporting requirements.

The computer produces monthend financial reports late because (1) outdated data entry and retrieval methods are used, (2) inefficient ways to identify and correct coding and keypunch errors are used, and (3) the computers often break down.

The need for modern input and output methods was reported on by a Federal Highway Administration task force in July 1976. Action has only recently been initiated to use such methods because of resistance to date by the Finance Division. The Division is satisfied with the manual system, and top Federal Highway Administration management has not forced the issue by directing that the automated system be redesigned.

Manual and automated systems overlap

The Headquarters Finance Division and regions keep manual records that summarize the same information recorded in the automated files. Manual records include (1) the general ledger, (2) cash receipt and disbursement registers, and (3) the allotment ledger. The main purpose of the computer records is to hold detailed information to back up the manual records. Accounting is done as follows.

- Regions record in their manual records the information on financial transactions they receive and then forward the transactions to the Finance Division.
- The Division summarizes and posts each day the transactions from the regions and transactions originating at Headquarters to manually kept cash receipts and disbursement registers.
- The Division sends transaction documents to a contractor for keypunching of information from the regions and Headquarters onto cards, and controls the processing of these cards through the computer to produce a series of machine listings that rearrange, summarize, and present transaction information in several ways.
- The Division posts daily totals from the cash receipts and disbursements registers to the general ledger, which is maintained on a bookkeeping machine.
- The Division, at monthend, manually transcribes general ledger account balances to trial balance statements; trial balance statements affecting only the highway trust fund are then transcribed onto punched cards and fed through the computer to produce a "machine-prepared" trial balance for the fund. The remaining trial balances are manually consolidated.
- Regional and Headquarters staffs prepare monthend reports to Treasury from their manual records.
- The Division routinely reconciles information on computer reports with information in manual records to disclose and correct any discrepancies.

Limited use of the outputs
of the automated system

One primary use the Headquarters Finance Division makes of computer reports is to reconcile the information in them with information in manual records to disclose and correct any discrepancies. For example:

- The computer-prepared Individual Region Recap and Monthly Overall Recap reports are used to verify the accuracy of the regions' manually prepared reports of status of allotments, which in turn are prepared from the regions' manual allotment ledgers. Likewise, the Quarterly Overall Expenditure Report, Park Roads Report, and Park Roads by Appropriation and Project Report are used to verify reports prepared manually by the regions.
- The automated Washington Office Recap Report is used to verify the accuracy of the Washington Office Allotment Ledger.
- The Summary of Allotment Ledger Transactions is the major computer report routinely used to post allotments of appropriated funds, reimbursements, and transfers of spending authority between allotments to the manual general ledger.

The regions also make limited use of computer reports because (1) they are usually received after due dates for submission of monthend reports to Treasury and (2) they do not summarize and present information in formats needed by the regions to control funds and track expenses. As a result, each region runs its own manual system to (1) prepare and send monthend reports directly to Treasury and (2) meet its own financial information needs. An example follows.

Region III (Baltimore) sends transaction information to the Headquarters Finance Division for keypunching onto cards and computer processing. The region receives two monthend computer reports, but they do not present information needed to prepare monthend reports to Treasury. One report simply lists information the region sent to Headquarters that was actually posted to the automated records. The second report is used to help prepare yearly budget submissions. As a result, the region runs its own manual system to meet these monthly reporting requirements.

OVERLAP RESULTS IN UNNECESSARY COSTS

The overlap between the manual and automated portions--in both the Headquarters Finance Division and regions--of the Accounts System causes the Federal Highway Administration to incur costs to (1) record basic financial information twice--first in manual records and second in the automated files, (2) perform extensive reconciliations of the information in the manual and automated records, and (3) manually prepare monthend reports that the computer could produce more economically.

We could not estimate the costs unnecessarily incurred because the Division does not track the time spent preparing information for computer processing, reconciling manual records with automated records, and correcting coding and key-punch errors.

However, the overall costs of the overlap indicate the potential for cost reductions. These costs for calendar 1977 totaled more than \$1.2 million; that is, \$627,000 in personnel costs for the Finance Division, about \$500,000 in personnel costs for the regions, and \$110,000 for computer services from the Department of Transportation's Computer Center.

WHY THE ACCOUNTS SYSTEM USES PEOPLE AND COMPUTERS INEFFICIENTLY AND INEFFECTIVELY

The crux of the Finance Division's problem with (1) agreeing to further automation of the system and (2) eliminating the redundancy in manual and automated processing steps is the delay in getting monthend computer reports. These delays are caused by (1) outdated data entry and retrieval methods, (2) inefficient ways to identify and correct coding and key-punch errors, and (3) equipment breakdowns.

Modern input and output methods could help (1) put information into the computer faster, more accurately, and at a lower cost than the traditional methods of using keypunch equipment and punched cards and (2) obtain needed reports from the computer on time. Such methods were recommended by a special task force in its July 1976 report.

Outdated input and output methods

The Federal Highway Administration relies on the mails to transmit transaction documents from the regions to Headquarters for keypunching onto cards and computer processing.

This procedure results in the unscheduled submission of documents. Further, the Headquarters Finance Division uses nonstandard batch sizes, which causes additional delays in producing monthend reports. For example:

- The Division batches documents for transactions originating at both Headquarters and regions. These batches are sent to the Department of Transportation's Transportation Computer Center for computer processing. Because no attempt is made to schedule submission of documents to assure that transactions are submitted at a steady rate throughout the month, monthend processing bottlenecks occur.
- The Division does not use a standard batch size. Nonstandard large batch sizes increase the number of documents rejected by computer edit checks and result in delays in computer processing.

During an 8-month period in 1978, 87 percent of the monthly transactions reached the computer center after the 15th of the month; 79 percent of these reached the center after the 20th of the month. Consequently, monthend processing bottlenecks develop, which delay processing reports. It is a generally accepted data processing practice to schedule the submission of transaction documents at a steady rate during the month to avoid monthend bottlenecks.

In the same 8-month period, 23 to 42 percent of the batches were rejected because transaction subtotals did not equal overall manually developed predetermined control totals for each batch. These reject rates could be lowered if a smaller standard batch size were used. In 1 month, for example, batch sizes ranged between 42 and 500 documents for an average batch size of 188 documents; the number of documents in each batch that caused the batch to be rejected ranged between 0.2 to 4.2 percent, with an average 0.9 percent per batch or an average of 1.7 documents per average batch of 188 documents. There is a greater chance that a batch of 500 documents will contain 1 or 2 bad documents and be rejected as opposed to a batch of 100 documents. In many automated systems, a standard batch size of 100 documents is used.

Batches rejected by computer edits because transaction subtotals do not equal manually developed, predetermined control totals are returned in their entirety to the Finance Division for identification and correction of errors. Most of the time, batches are rejected by computer edits because of keypunch errors. If, when the Division returns supposedly corrected batches for reprocessing, an error still exists,

the entire batch is again returned to the Finance Division for identification and correction of errors. This ping-ponging of batches significantly contributes to untimely monthend reports. For example, in a 1-month period, it took between 2 and 10 days, or an average of 5.5 days, to process a batch through the computer.

Ineffective and inefficient ways
to detect and correct coding
and keypunch errors

Batches are rejected only if transaction subtotals do not equal manually developed, predetermined control totals. Other errors, like the wrong appropriation or activity code, are accepted by the computer and posted to the automated files, but these errors are "flagged" on computer-produced transaction lists for later correction by the Finance Division. Documents including flagged items must be corrected by the Division and rekeypunched and reprocessed through the computer to correct erroneous information posted to the computer files. Knowingly posting incorrect information to the computer files causes delays in producing needed financial reports.

It is a generally accepted data processing practice to reject from further computer processing all transaction records that include incorrect or incomplete information and return them for correction of errors and resubmission of corrected transactions before further computer processing is done. To knowingly post incorrect information to the files is contrary to generally accepted data processing practice because this (1) insures that files and reports will include erroneous information and (2) increases the time needed to correct bad information in the files.

Knowingly posting incorrect information in the automated files has caused delays in producing financial reports. For example, computer runs to produce quarterly and semiannual reports frequently must be repeated because the Finance Division finds omissions and errors which require manual corrections. Yearend reports for fiscal 1978 were rerun in their entirety four times because of changes by the Division. These reruns required 160 boxes of computer paper.

Task force recommends modern input
and output methods

Modern input and output methods--like computer terminals--could help (1) get information into the computer faster, more

accurately, and at lower cost than with the traditional methods of using keypunch equipment and punched cards and (2) get needed reports from the computer on time. 1/

A Federal Highway Administration task force studied the agency's management and financial information systems and issued its report in July 1976. The study objective was to determine ways to simplify these systems and modernize data entry and retrieval. The report included many detailed recommendations for short-term improvements to existing systems. The task force concluded that the existing systems overlapped and used out-of-date data entry and retrieval methods. It recommended development of an agencywide management information system that would combine these separate systems. The task force envisioned the new system to consist primarily of a central data base to which Headquarters and regions would be linked by computer terminals. The terminals would enter transaction information into and pull reports from the data base.

The agency implemented many of the recommendations to improve existing systems, but it did not act on the recommendation to design a management information system to combine its existing financial and administrative systems into a single system using modern, efficient input and retrieval methods. The Finance Division's resistance to the further automation of the Accounts System prevents redesign of the system to use modern input and output methods.

DEPARTMENT OF TRANSPORTATION IS WORKING
WITH GENERAL SERVICES ADMINISTRATION
TO ACQUIRE NEW COMPUTERS

The Department is working with General Services to acquire new computers to solve the breakdown problems with the existing ones. The new computers will be able to use modern, efficient methods for data entry and retrieval and for detecting and correcting coding and keypunch errors.

Redesign of the Accounts System is needed, so it will be able to fully use the advanced capabilities of the new computers and better meet the needs of both Headquarters and regional managers. The redesigned system should use modern data entry and retrieval methods. It should conform to the

1/"New Ways of Preparing Data for Computers Could Save Money and Time and Reduce Errors," FGMSD-78-39, July 18, 1978.

accounting principles and standards prescribed by the Comptroller General and be submitted to him for approval, as required by the Budget and Accounting Act of 1950.

CONCLUSIONS

The Accounts System does not use modern data entry and retrieval methods. These outdated methods cause the computer to produce reports that do not get to users in time to meet due dates for monthend financial reports to Treasury and the Office of Management and Budget.

The new computers the Department of Transportation is working with the General Services Administration to acquire will be able to use modern input and output methods--that is, computer terminals. The system will have to be redesigned to take advantage of the new computers' processing capabilities. Without redesign, the Federal Highway Administration will use the new computers' increased processing capabilities and speeds inefficiently and uneconomically.

RECOMMENDATION

We recommend that the Secretary of Transportation direct the Federal Highway Administration to start now to (1) redesign its Accounts System to eliminate overlapping manual and automated processes, automate the general ledger, use modern data entry and retrieval techniques, and use efficient ways to identify and correct errors and (2) assure that the redesigned system is designed in accordance with the Comptroller General's accounting principles and standards and submitted to him for formal approval.

AGENCY ACTIONS

The Federal Highway Administration agreed with our recommendation to redesign its Accounts System. On October 30, 1979, the Office of the Secretary of Transportation approved a project to design and implement an automated Management and Fiscal Information System to replace the existing accounting and related administrative systems.

If designed and implemented as planned, the new system, which will use modern data entry and retrieval methods, should take care of the problems we identified with the Accounts System. The new system is to be fully implemented by November 1981.