

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

The Office of Management and Budget

Office Automation Study
of the District's Transportation
Operating Divisions

A Study Submitted to
Manager of Operations

Mr. Samuel M. Black

in Partial Fulfillment of the Requirements of
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By

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Office Automation Study

1.0 Introduction

The Office of Management & Budget (OMB), formerly the Management Services Section, at the request of the Manager of Operations, has completed a review of the paperwork and procedures of the Transportation Operating Divisions. This study, funded by an UMTA Section 8 grant, was conducted to ascertain the potential of performing various clerical functions more efficiently on data processing equipment. The hypothesis of the study was that the operating divisions could utilize data processing equipment to reduce time spent on repetitive tasks and to improve information accuracy and accessibility. This report will explain the methods used to gather data relevant to the hypothesis, detail the results of the analysis of this data and present recommendations concerning actions to be undertaken.

2.0 Background

The request for this Section 8 grant was created and developed by the Telecommunications Department. The original purpose of the grant was to examine the office automation needs of the District. While this grant proposal was being developed, OMB was studying clerical productivity and had decided to convene a Word Processing Committee.

During the time that the grant was going through the approval process, OMB performed a study of the word processing needs of the Operations Department for the Word Processing Committee. The committee chose the Operations Departments because of the interest and commitment of the Manager of Operations. OMB was selected to perform the study because of its experience in working with each of the groups to be studied.

The Committee also evaluated the word processing needs of the support departments. Its members developed and issued specifications, which

led to the procurement of the DEC equipment. When the \$50,000 grant was awarded on July 1, 1981, it was apparent that the Word Processing Committee had already completed most of the work described in the grant. Word processing equipment purchased by the District on the recommendation of the Word Processing Committee was then being delivered. It was understood that the focus of the grant would have to be changed.

One obvious candidate for the study was the Transportation Operating Divisions, which had been omitted from the study of the other Operations Departments when OMB did its first word processing study. The Manager of Operations endorsed the idea that OMB study the office automation needs of the Transportation Operating Divisions.

Data Processing was beginning to look at the feasibility of computerizing some Transportation/Accounting procedures at this time, so the grant funds were divided: OMB retained \$10,000 to perform the revised office automation study (word processing) and Data Processing received \$40,000 to aid their analysis of the Transportation Operating Divisions' payroll and timekeeping functions (data processing).

3.0 Methodology

After meeting with Transportation Department personnel to establish the scope of this study, it was determined that a literature search would be appropriate. The purpose of this search was twofold. First, there was the desire of those conducting the study that previous efforts dealing with office automation in the District not be duplicated. The second purpose of the literature search was to discover where attention needed to be focused to fill "gaps" in knowledge. The literature search revealed several reports either written by District personnel or consultants working under contract to the District. These reports ranged from previous Management Services studies of Operations Department's office automation needs to an Arthur Andersen

and Company study of the mark-up/timekeeping/payroll functions. Office automation case studies and other articles in industry publications were reviewed to identify possible applications and to help avoid the mistakes often made in office automation feasibility studies.

When the review of written material was completed, meetings were held with District employees who had participated in similar studies to insure that their knowledge, experience and opinions were considered. Interviews were held with division personnel who were unfamiliar with office automation but whose knowledge of the materials and procedures used in the field were very valuable in identifying possible applications. Meetings or interviews have been held with division stenographers, dispatchers, instructors and managers, almost the entire Transportation General staff, Data Processing programmers and systems analysts, and representatives from hardware manufacturers. These interviews were the primary method used to determine office automation applications.

Written procedure manuals used to train division dispatchers and division stenographers were also of great benefit to this analysis. These manuals were useful when tracking paper flow and when tracking data transfer from one form to another. Field observations and knowledge gained during past studies were compared to the procedure manuals to detect discrepancies between what is actually done and the methods described in the manuals. This was done so that the analysis would be based on actual events.

4.0 Study Findings

The result of the literature search, meetings and interviews, and other information gathering efforts was the realization that three relatively separate areas existed within the divisions which required attention: division dispatcher function, division stenographer function, and division instructor function.

4.1 Division Dispatchers

There are three basic division dispatcher positions: window, mark-up and timekeeping. These positions are responsible for assuring that each bus run has an operator assigned, that the run begins on time and that each operator is correctly paid for the time worked. Dispatchers generate a large and varied amount of paperwork in order to meet their responsibilities. Most forms are completed in pen or pencil. Typing information onto forms would take an unacceptable amount of the dispatcher's time, especially when forced to make corrections on multiple copies while at the window or on the telephone. Even though typed forms are much easier to read, changes or corrections are simpler to make when the original is in pencil. A terminal with keyboard and Cathode Ray Tube (CRT) would provide the benefits of both the penciled or typed entry. The information could be entered on a CRT much like a typewriter and be just as legible, but could be corrected or updated more quickly.

Several division dispatchers indicated that multiple documents must be consulted in an effort to answer daily questions. Since most of the documents used by dispatchers have a great deal of overlapping information in them, a central data base containing pertinent information on every division operator could be used to produce a single document with all of the information the dispatcher needs. The data base would contain individual operator "records" made up of many "fields." Each field would contain a specific piece of data, such as the operator's name, badge number, run number, etc. This information could be called up in whole or in part, for one operator or all operators or just the operators who were hired before a certain date. This type of information processing would be valuable at those times when the divisions are called upon to gather unique kinds of data. Requests for information from Transportation General concerning availability of certain operators, average number of years worked by division operators and the number of operators with expired drivers licenses would all quickly answered by data processing equipment.

Other dispatcher duties which could be performed by a data processor are functions where data is transferred from one form to another, resulting in lower productivity and transposition errors. An example is the mark-up dispatcher's function: data is transferred from "Request for Work", "Operator Assignment Changes", "Daily Event Sheet-Sick Report" and other forms onto the "Classified Work Sheet." At any point where a form can be eliminated or merged and put onto a data processor then time will be saved by entering repetitive data fewer times and the chance of transposing numbers will be reduced.

Dispatchers must work with operators "bumping" other operators from work runs. This weekly event occupies more dispatcher time than would otherwise be the case if a data processor were available. With even a simple data base a dispatcher could quickly check the bump to insure that it is in order and then prepare documents showing the choice of runs available for the bumped operator. This information could be telecommunicated to Transportation General to process the systemwide bumps and bids process negotiated in the recently adopted union contract.

Overall, the introduction of data processing equipment would help to eliminate some of the tedious, repetitive and error prone work now performed by division dispatchers while at the same time giving fast and accurate information gathering capabilities.

4.2 Division Stenographers

Division stenographers could realize many of the same benefits as the division dispatchers. Records now kept manually by division stenographers or on computer printouts sent to the divisions from other sources could be replaced by using the same data base suggested for the division dispatchers. Division stenographers keep separate files for name, badge number, vacation and floating holidays, medical card and birthday and anniversary listings. All of these files could be merged into one. The name listing contains name in alphabetical order, badge number, address and telephone information typed in by the

stenographer while the badge file contains badge number in numerical order, name and date of employment data entered the same way. By merging just these two files, name and badge data would be input one less time, data would be easier to change, metal file containers would be eliminated, and data could be transferred on disks to the division the operator moves to. The benefits mount when the other files mentioned above are also merged. With each division having its own data base, division stenographers would not be dependent upon the lists generated by headquarters. The information sent by headquarters originates in the divisions, but if each division had its own data processor then the relay of information back and forth from headquarters could end. The divisions could enter the data and have access to it anytime they so desired.

There are limited text editing or word processing applications for use by division stenographers. Operator commendation letters, first level hearing notices and "smoke-out" letters could all be placed on a word processing machine. The result of this action would be letters easily corrected for errors and having a professional appearance currently unknown.

4.3 Division Instructors

The Division Instructors also maintain their own bus operator data base. Considerable instructor time is devoted toward manually updating individual employee records. In addition to the individual operator records, many instructors have developed systems of maintaining logs of accidents, check rides, and other statistical information for the purpose of evaluating future assignments. This reliance on manual record-keeping consumes an inordinate amount of instructor resources and limits their capability of data retrieval. This commitment of instructor resources to routine clerical tasks reduces the instructor manhours available for operator performance monitoring and training. Since these routine tasks are usually given priority treatment on daily basis, it creates a hardship on the divisions' instructional staffs to accomplish the tasks that they

alone are qualified to perform. Although some of this burden has been alleviated by the introduction of typist clerks at the divisions, the Senior Instructors still tend to devote inordinate amounts of time to clerical record-keeping. Finally, the instruction function would have limited use for text editing applications with the word processing equipment.

5.0 Conclusions/Recommendations

The major recommendation of this study on the office automation needs of the Transportation Operating Divisions is to conduct a field test utilizing the equipment and applications described in this report. The primary reason for making this recommendation is that the need for this equipment has been clearly demonstrated. The best method to prove what a data processing system could do in a division, without incurring significant costs, is to conduct an on site test for a three or four month period. The cost of the test would depend upon whether or not equipment could be borrowed from other departments or obtained free of charge from the vendor for a test period. The other main costs would be training employees to use the equipment and the employees' time to input the data base into the computer. Even if the District should be forced to buy the equipment and hire temporary help to input data, the total cost would be in the \$20,000 range.

Based upon the tasks which have been described as potential data processing applications, the equipment should have the ability to sort up to 600 detailed records very quickly, should be relatively simple to use, have text-editing capabilities, have basic computational abilities and be a stand alone unit. The equipment should also have storage disks with sufficient density to store all division records on one disk. While this list of features is not exhaustive, it does contain the primary characteristics of the desired system. One difficult aspect of the test is making sure that the test does not fail simply because the wrong equipment was chosen. The selection of the equipment to be utilized in the test should be made by the Telecommunications Department working with Transportation General and the Operating

Divisions. (The use of data processing equipment with the capability to store an entire data base on a single disk will be easier for division personnel to use, and the system cost is kept to a minimum because extra on-line disk drives are not needed.)

A three or four month long test period would be of sufficient length to have the system up and running long enough to assess its impact. To significantly reduce start-up time it is suggested that all data be input prior to the test period. In this way, the data base will be available from day 1 and division staff will only be responsible for updating the data base. There will be added pressure upon division office staff, as they will be maintaining two systems. For this reason, a test period of longer than four months is not recommended. During the first month, weekly meetings with the participants may help to resolve problems and work out unforeseen difficulties. After the first month once a month meetings should be adequate to gather reactions to the equipment's performance and to discuss special features or unique situations which arise.

In order to determine which divisions should be test locations there are several points to consider. These points include division size, distance from headquarters and willingness to participate in the test program. Division size is important because of the large variance in the size of operating divisions. A project might be easier to implement at Division 6, the District's smallest, as compared to Division 5 which is three times larger in terms of manpower. The critical issue of fitting the division data base on a single disk can only be resolved by attempting to place the information from the largest division on a disk. Therefore, Division 5 is one obvious choice for a test division.

The distance between headquarters and the test division, in terms of travel time, is important when considering training division staff and any trips the District equipment instructor must make. Should division personnel find themselves unable to obtain data from the computer, and if the issue cannot be resolved over the telephone, then the instructor will have to make a field call.

Perhaps the most important criterion of all is the willingness of division office personnel to participate in a test program working with computers. If division personnel are not enthusiastic and willing to try to make the equipment work, then the test will not be successful. People often fear computers or are intimidated by them. One way in which this problem could be avoided would be to assign a division already using computers to the test program. Dispatchers at Divisions 12 and 18 currently use their personal Apple II computers to create the division Extra Board mark-up. These dispatchers have created their own divisional data base similar to the one described earlier. Samples of the data runs used by the dispatchers at these two divisions are attached. The personal desire of these individuals to see the test program succeed would guarantee a fair display of the equipment's ability to perform. Despite the small size of the two divisions, they could be an indicator of the program's success or failure.

6.0 Summary

This study has determined whether data processing applications exist in the Transportation Operating Divisions to the extent that computers should be installed. Enough evidence was discovered to support the recommendation that a test program be conducted over a three to four month period at two Operating Divisions. Based upon the results of this field test, further recommendations concerning the placement of data processing equipment in the Operating Divisions could be made.