MASSACHUSETTS
GENERAL COURT

JOINT COMMITTEE
ON POST AUDIT
and
OVERSIGHT

Registry of
Motor Vehicles

Data Processing
Services

Post Audit and Oversight Bureau

JANUARY 31, 1975
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</tbody>
</table>
FOREWORD

The Legislative Post Audit and Oversight Bureau was established by Chapter 1008 of the Acts of 1971, as amended by Chapter 247 of the Acts of 1972. Its purpose is to conduct, under the direction of the Joint Legislative Committee on Post Audit and Oversight of the Massachusetts General Court, a legislative auditing program with special emphasis on performance auditing. For the purposes of the work of the Bureau, the term "performance auditing" is defined as an auditing program conducted for the particular purposes of making an appraisal or evaluation of the efficiency of operations, the effectiveness of programs, and the faithfulness of administrative compliance with the intent of legislation and administrative regulations affecting a specific agency of the Commonwealth.

Senator Francis X. McCann serves as the Senate Chairman of the Joint Committee on Post Audit and Oversight by appointment of the President of the Senate, while the Speaker of the House of Representatives has designated Representative Gerald P. Lombard as the House Chairman thereof.

The Joint Committee on Post Audit and Oversight had directed the Post Audit Bureau to conduct a study of computer use by state agencies. During the course of this study, it became apparent that deficiencies existed in the computer system at the Registry of Motor Vehicles and that this had become a cause of serious concern to those user groups who relied on this system for data. This included federal, state and local law enforcement agencies and the state’s cities and towns. Accordingly, it was determined that an evaluation of this system be made independently of the general study.

The report, herewith submitted, concentrates on factual analysis and evaluation and presents findings and substantive recommendations.

In accordance with policy, copies of this report were delivered to the administrative heads of the agencies involved, viz., David J. Lucey, Registrar of Motor Vehicles, and Richard H. McLaughlin, Secretary of Public Safety. Their comments were requested but both declined as their terms of office were expiring. Copies have been provided to their successors and a reply received from the Acting Registrar of Motor Vehicles which is in the Agency Response section of the Appendix.

On behalf of the Post Audit Bureau, I wish to note our appreciation to the members of the Joint Committee on Post Audit and Oversight for their assistance in the development of this report and to express our thanks for the cooperation extended by all those contacted during the period this audit was in progress, including personnel at the Registry of Motor Vehicles, state and local law enforcement officials, and municipal officers.

January 31, 1975

WILLIAM H. FINNEGAN
Director


The automatic data processing system (ADP) at the Registry of Motor Vehicles (RMV) was designed to be a repository of data concerning approximately 3.2 million registered motor vehicles and 3.8 million licensed motor vehicle operators. Its objective was to establish an accurate and current data bank (Registration Master File) which would provide immediate answers to inquiries relative to such data by all authorized users of the system, including federal, state and local law enforcement agencies, and which would permit the production of accurate and timely billings of motor vehicle excise taxes for the Commonwealth's cities and towns.

This objective has not been met for a variety of reasons, each of which has served to hinder the efficiency and effectiveness of the system to the detriment of those user groups which rely on it for data.

Appropriations and Personnel

Cost/Budget Ratio. The sum of $19,454,751.00 was appropriated for RMV for Fiscal Year 1974, of which approximately $2,000,000 was included for data processing related expenses. This constitutes a cost/budget ratio of 9.20 percent and is a substantial deviation from state norms determined by the National Association of State Information Systems (NASIS) as the result of a survey which concluded that the average state cost/budget ratio was 0.65 percent.

Functional Distribution of Personnel. In Fiscal Year 1974, there were 177 personnel employed in the data processing operation. An analysis of the functional distribution of such personnel again indicates a marked variance from state norms as determined by the NASIS survey and as outlined in the following table.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number Of Personnel</th>
<th>% Of Operation</th>
<th>% Of Operation Nasis Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>2</td>
<td>1.13%</td>
<td>8.00%</td>
</tr>
<tr>
<td>Systems and Programming</td>
<td>13</td>
<td>7.34%</td>
<td>25.00%</td>
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<tr>
<td>Operations</td>
<td>23</td>
<td>13.00%</td>
<td>19.00%</td>
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<tr>
<td>Data Entry and Clerical</td>
<td>139</td>
<td>78.53%</td>
<td>48.00%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>177</strong></td>
<td><strong>100.00%</strong></td>
<td><strong>100.00%</strong></td>
</tr>
</tbody>
</table>

Management Problem Areas

During the past five years, the data processing operation has been plagued by several problem areas. These include planning, organization, control and communication.

Planning

Planning and Personnel Training. There was no long-range data processing planning at RMV. An unofficial short-range planning group had been established by the Registrar which was utilized in crisis situations. It did not include, however, top level data processing management. Consequently, an informal group rather than an accountable organizational entity controlled the decision making process.

This deficiency resulted in the absence of a formalized personnel training program in-house and little participation in training sessions conducted by the computer vendor. Consequently, RMV has been forced to rely on the vendor for assistance in making changes, additions and deletions in programs, and at additional cost in each instance.

The lack of planning and the failure to provide adequate training has been aggravated by the practice of utilizing key data processing positions to provide employment at higher salaries for personnel with little, if any, experience in the field of data processing.

Unverified Data. The input of unverified information into the data base has been a major flaw in the computer operation. This deficiency has existed for at least five years and has been recognized both by the data processing section and the computer vendor.

It was caused by the new procedure, instituted in 1969, of staggering motor vehicle registrations over a two year period instead of annually. This required the registration master file to be constantly updated and complicated its maintenance because of non-information or mis-information on documents, the failure to receive certain documents, and administrative decisions not to verify information. This inevitably resulted in inaccurate updating transactions to the registration master file and the generation of erroneous data or a “no response” to inquiries from user groups. In fact, there were over 500,000 updating transactions which had been rejected by the computer because of inaccuracies contained therein.

Organization

Organizational Structure. The data processing section is a fragmented entity because the data entry function has been removed from its jurisdiction and established as a separate unit at the direction of the Registrar of Motor Vehicles. Responsibility for its operation was entrusted to an individual who, at the time, was serving as the Budget Director of Traffic and Accident Records at RMV, a position totally unrelated to data processing. Furthermore, there is no evidence that this person possessed any background or experience in this field.
Input-Output Data Control. There is no organizational unit, either within or outside the data processing section, which serves to control the type and content of data which flows to and from the RMV computer system. Such a unit would normally be termed an Input-Output Control Section or a similar title which connotes data control. Its primary function is to maintain the quality and accuracy of information as it enters the data base and is subsequently retrieved.

The lack of such a unit has served to permit the entry of unverified, non-sequential, and erroneous information into the computer data base. This has resulted in a marked increase in the number of "no response" messages to inquiries by law enforcement agencies, the issuance of motor vehicle certificates of title without proof of validity, and an enlarged error rate in the production of motor vehicle excise tax bills.

Use of Consultants for Data Entry Purposes. The inefficiency and poor productivity of the ADP operation has caused administrative management to accept the necessity of engaging outside firms on a contract basis to perform a basic data processing function — data entry.

During Fiscal Year 1974, RMV contracted with private firms to provide data entry services at a cost of $239,598.94. To substantiate this expenditure, the Registrar contended that his agency did not have the in-house capability to perform such services. A Post Audit Bureau analysis of the productivity of the data entry section for the month of February, 1974, revealed however, that if data entry personnel had used their machines 65% of available time, these services could have been provided in-house at no additional expense.

Computer Security and File Integrity. Computer security and file integrity are essential elements in a successful data processing system. There is little evidence, however, to suggest that either exists in the RMV system.

Instances of private firms advertising in industry publications of their access to the RMV computer and its data were found and an attempt made to verify the claims contained in these advertisements. This proved fruitless because the activity monitor program, which was part of the systems design, had been arbitrarily removed from operation shortly after the computer became functional. The purpose of this program was simply to create a record of the inquiries to the computer data base through its on-line instant retrieval system. The absence of this record precludes a determination of exactly what sources, authorized or unauthorized, have access to the information contained in the computer data base.

System Deficiencies Affecting the Title Division. The Title Division is charged with the responsibility of issuing valid certificates of title to owners of registered motor vehicles. To accomplish this, the Division relies heavily on the data processing section for vehicle information printouts.

The failure of this section to provide such printouts weekly, as is required, has helped to defeat the purpose of the Division and has resulted in it issuing in excess of 100,000 certificates of title without proof of validity.

Communication

Intra-Agency. The lack of effective communication and cooperation between the administrative hierarchy and data processing management is a recognized fact of life at RMV and is readily admitted by all concerned. This served to aggravate the deficiencies in the data processing operation to the detriment of user groups. Data processing management has apprised administrative management of its problems and has offered recommendations to correct the situation. Little has been done, however, to ameliorate the condition.

Auto Theft Records. The auto theft section of the Title Division has often experienced time lags in the updating of its files because the systems design of the computer precludes the use of the section's on-line terminal for such purpose when the registration master file is being updated. This latter procedure has taken as long as three weeks to complete. This, in addition to the fact that this section has had limited time availability for entering information into the computer, has caused it to be two to three months in arrears. Furthermore, hundreds of transactions involving stolen vehicles have never been entered into the computer data base.

Impact Upon Law Enforcement Agencies

A Post Audit Bureau survey conducted among state and local law enforcement agencies who are clients (users) of the RMV computer system revealed great dissatisfaction with it. Complaints ranged from excessive down time, to the receipt of erroneous information, to the receipt of no information at all. Numerous instances exist whereby these agencies were unable to properly fulfill their responsibilities because of the deficiencies in the RMV computer operation. This becomes of increasing concern at this point in time because of the excessive use of motor vehicles in the commission of crimes and the possible jeopardy to the lives and safety of law enforcement officials and the public.

Impact Upon Municipalities — Excise Tax Revenue Lost

Interviews and correspondence with municipal officials in the Commonwealth who rely on the RMV data processing system to produce motor vehicle excise tax bills for their communities and who compensate RMV for such services, indicated their dissatisfaction, also, with that agency's efforts.

Figures on excise tax billings compiled by local assessors and tax collectors and also by the state
Department of Corporations and Taxation revealed that the failure of RMV to maintain an accurate and current registration master file, from which the necessary data is retrieved in order to produce excise tax bills, has resulted in an ever-increasing number of erroneous billings, late billings, and no billings at all in many instances.

Many communities, consequently, have been compelled to borrow money in anticipation of excise tax revenues in order to meet current operating expenses. This has increased their overall operating costs with a resultant reflection in the local property tax rate. This is further compounded in those instances where no excise tax billings are received at all. In 1972, for example, it has been conservatively estimated that over $5,000,000 of excise tax revenue was lost to communities in the Commonwealth.

Conclusion

The automatic data processing system at RMV has failed to accomplish its objective of maintaining current and accurate data on the approximately 3.2 million registered motor vehicles and 3.8 million licensed operators in Massachusetts.

This failure is primarily attributable to a lack of management consciousness which pervades the entire decision-making process for data processing and the end product has had a harmful effect on user groups which it was designed to serve.

The effectiveness of law enforcement agencies which rely on the RMV computer system has been hindered while the Commonwealth’s cities and towns, which depend on this system for the processing of motor vehicle excise tax billings, have suffered financial detriment. This latter, occasioned by RMV failure to process the billings accurately and in a timely fashion or, as happened in a multitude of instances, to process them at all, has caused many of the municipalities to borrow money to meet current operating costs thus incurring additional expenditures with an inevitable effect on local tax rates.

This same lack of management consciousness has caused serious internal problems at RMV. The absence of a training program for data processing personnel has created a dependency on consultants not only for major programming or systems changes, but also for keypunching for data entry purposes. The failure to enter accurate data into the computer and/or the insertion of inaccurate information into the data base have adversely affected the Title Division and its auto theft section in their operations.

The failure of administrative management at RMV to resolve the problems which have existed in that agency’s data processing operation for an extended period of time and which have been adequately brought to its attention, evidences a disregard of responsibility and, as such, falls within the realm of mismanagement.
INTRODUCTION

RATIONALE FOR STUDY

SCOPE OF STUDY

METHODOLOGY
I. INTRODUCTION

Rationale for Study

During the conduct of a study on automatic data processing (ADP) operations in the Commonwealth, the Post Audit Bureau staff became aware that serious deficiencies existed in the computer system at the Registry of Motor Vehicles (RMV) which not only hindered agency personnel in the performance of their duties but also had a deleterious effect on other law enforcement agencies and on the fiscal condition of the state's cities and towns.

Consequently, it was determined that a further evaluation of this system should be made and the results reported independently of any other report on ADP systems.

Scope of Study

The study was confined to the actual operation of the ADP system at RMV and its effects on that agency as well as its impact on law enforcement agencies throughout the state. It was further directed to include an analysis of the financial impact on the municipalities of the Commonwealth insofar as the same related to receipts from motor vehicle excise taxes.

Methodology

The objectives of the RMV computer system as viewed by the agency were examined and the organizational structure for ADP services reviewed.

An analysis was made of the appropriations and personnel for such services for Fiscal Year 1974 and these were compared against similar items for Fiscal Year 1968, the last year for which such figures were available. In addition, a survey was taken to determine the functional distribution of data processing personnel.

Inquiry was made of law enforcement agencies to elicit their views as to the value of the RMV computer system, and likewise, of city and town officials relative to excise tax receipts resulting from billings generated by this system.
BACKGROUND

SYSTEM OBJECTIVES

PROBLEM RECOGNITION

APPROPRIATIONS AND PERSONNEL

FUNCTIONAL DISTRIBUTION OF PERSONNEL
II. BACKGROUND

The primary function of the data processing facility at RMV is to gather, store and disseminate information relative to the registration of approximately 3.2 million motor vehicles and the licensing of 3.8 million motor vehicle operators in a timely and accurate manner.

The system maintains accident records, stolen vehicle data, ownership and title information, and generates excise tax billings. Excise billings prepared by RMV represent a sum in excess of $150,000,000 annually which accrues to the Commonwealth's cities and towns.

Customers (users) of the RMV data processing facility include: branch offices of RMV; its Title Division; the Excise Tax Bureau of the Department of Corporations and Taxation; law enforcement agencies throughout the state; the courts; insurance companies; the 351 municipalities; and, most importantly, the general public.

The Registry of Motor Vehicles, which was originally computerized in the early 1960's, updated its ADP system in 1970 when it contracted with Control Data Corporation to install a CDC 3300 computer and necessary peripheral equipment. The contract further provided for the development of all systems and programs required for RMV to accomplish the stated objectives of its computer operation.

System Objective

The following is a description of the objective of the RMV data processing function as viewed by the agency:

The objective of the Registry's computer operation is to establish an accurate updated data bank which will provide immediate answers to inquiries by all Registry offices, police departments and other authorized users of the system. Said inquiries involve data on operators' licenses, registration records and various related documents in addition to providing accurate and timely billing of motor vehicle excise taxes. (Emphasis added)

The extent to which this objective has been met has been the subject of concern within RMV, in the news media, and among user groups, and it is the subject matter of this report.

Problem Recognition

The existence of serious problems and deficiencies in the ADP operation at RMV has been recognized for some period of time. The specificity of these problems will be detailed subsequently in this report.

The Secretary of Public Safety, who relinquished the post of Registrar of Motor Vehicles to assume his present position, is aware of them as are the Governor's office, the Executive Office for Administration and Finance, the present Registrar of Motor Vehicles, RMV personnel, law enforcement agencies throughout the Commonwealth, municipal officials, the news media, and the general public.

Numerous complaints have been made, news stories written, studies conducted, and recommendations made for corrective purposes, but the problem remains unabated.

A study conducted by the Executive Office of Public Safety, under the direction of its Assistant Secretary who previously served as Deputy Registrar of Motor Vehicles, concerned itself with the data entry portion of the RMV computer system. The results of this study, together with recommendations, were transmitted, under date of August 31, 1973, to the Registrar.

The Executive Office for Administration and Finance conducted an in-house study on overall RMV problems and this report, together with recommendations, was submitted to the Director of Data Processing and Telecommunications[1] under date of February 11, 1974.

Several news media stories have depicted the deficiencies of the system and the problems generated thereby and have outlined the complaints of law enforcement agencies and municipal officials.

Appropriations and Personnel

The sum of $19,454,751.00 was appropriated for RMV for Fiscal Year 1974 and, of this amount, approximately $2,000,000 was included for data processing related expenses. This indicates a cost/budget ratio of 9.2 percent which is a substantial deviation from state norms determined as a result of a survey conducted by the National Association of State Information Systems (NASIS). This survey concluded that the average cost/budget ratio was 0.65 percent.

A comparison of ADP expenditure and personnel figures at RMV between FY 1974 and FY 1968, the last year for which such figures were documented, reveals a 94.5 percent increase in personnel and a 162.8 percent increase in cost.

[1]The official, to whom the report was transmitted, subsequently terminated employment with A & F and assumed the federally funded position of Chief Supervisor of Data Processing—Highway Record Control at RMV on March 10, 1974.
Table I
ADP Expenditures and Personnel

<table>
<thead>
<tr>
<th></th>
<th>1968</th>
<th>1974</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditures</td>
<td>$756,113</td>
<td>$1,987,140*</td>
<td>162.8%</td>
</tr>
<tr>
<td>Personnel</td>
<td>91</td>
<td>177</td>
<td>94.5%</td>
</tr>
</tbody>
</table>

*Estimated for Fiscal Year 1974

Functional Distribution of Personnel

A Post Audit Bureau survey indicated the following functional distribution of data processing personnel at RMV:

Table II

<table>
<thead>
<tr>
<th>Category</th>
<th># of Personnel</th>
<th>% of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
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<td>23</td>
<td>13.00%</td>
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<tr>
<td>Data Entry and Clerical</td>
<td>139</td>
<td>78.53%</td>
</tr>
<tr>
<td>Total</td>
<td>177</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Table III
ADP Personnel Distribution

<table>
<thead>
<tr>
<th>Category</th>
<th>NASIS Survey</th>
<th>RMV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>8%</td>
<td>1.13%</td>
</tr>
<tr>
<td>Systems and Programming</td>
<td>25%</td>
<td>7.34%</td>
</tr>
<tr>
<td>Operations</td>
<td>19%</td>
<td>13.00%</td>
</tr>
<tr>
<td>Data Entry and Clerical</td>
<td>48%</td>
<td>78.53%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Here again, this distribution evidences significant deviations from the NASIS survey.
MANAGEMENT PROBLEM AREAS

PLANNING
ORGANIZING
CONTROLLING
COMMUNICATION
III. MANAGEMENT

PROBLEM AREAS

The process of management is divided basically into four functions: planning, organizing, controlling, and communicating. The effectiveness of any organization has a direct correlation to how well each of these functions is carried out. This section discusses some of the problems encountered in these areas and the resultant problems which have served to seriously hinder the efficiency and effectiveness of the RMV data processing operation. These may be delineated as follows:

Planning

Planning and Personnel Training. Planning has been defined as "the continuous process of making present entrepreneurial (risk-taking) decisions systematically and with the greatest knowledge of their futurity; organizing systematically the efforts needed to carry out these decisions; and measuring the results of these decisions against the expectations through organized systematic feedback."[1] In effect, it is the process of dealing, in the present, with the future.

There was a lack of a long-range data processing planning program at RMV. An unofficial short-range planning group had been established by the Registrar consisting of the Deputy Registrar for Administration, an Executive Assistant to the Registrar, an Administrative Assistant to the Registrar, and the Assistant Manager of Computer Operations. It did not include, however, the Chief Supervisor and/or the Manager of Data Processing. This group, as such, had no definable responsibilities other than to respond to crisis situations. Consequently, an informal group rather than an accountable organizational entity controlled the decision-making process.

The foregoing resulted in the absence of a formalized personnel training program in-house, and little participation in outside training sessions conducted by the computer vendor. The natural consequence was an almost total dependence on the computer vendor for system maintenance. During Fiscal Year 1973, only four members of an eleven member programming staff were sent to training courses conducted at various time periods during that year. Furthermore, despite a recognized need for further training, funds for this purpose were not requested by RMV during the last three fiscal years.

RMV, in 1970, entered into a contract with the firm of Control Data Corporation (CDC) for the installation of a third generation computer, CDC 3300, and its related peripheral equipment. The contract provided that the vendor would furnish all systems and programs needed, including new programming and reprogramming, for the efficient operation of the RMV computer system. The vendor’s performance under the terms of the contract was accepted by RMV as complete and the total system became operational in August, 1972.

Because of inadequate training, however, RMV programming personnel have been unable to effect any major reprogramming of the operating systems. Whenever a problem of this nature occurred, CDC was engaged to remedy the situation. The most recent instance is evidenced by an agency request, under date of February 14, 1974, for authorization to engage CDC on a consultant basis to provide: "Analyst support service to conduct review and application of present programs and to assist our staff personnel in making changes, additions and deletions in programs originally supplied by Control Data Corporation." (Emphasis added). In explaining the need for such services, RMV stated: “Experience indicates that original programs need changes and alterations to accommodate present needs and future projections.” To paraphrase, RMV is saying that, although it has eleven filled programming positions, it is unable to provide in-house maintenance programming and must resort to consultants for this purpose. The agency request was approved and a consultant contract entered into for a four and one-half month period with a maximum obligation of $5,000.

The lack of proper planning and the failure to provide adequate training for ADP personnel either in-house or without, has been aggravated by the practice whereby RMV administration has utilized key data processing positions to employ personnel with little, if any, experience in this field. The instance of the Chief Programmer’s position being filled by an individual with no background and experience in data processing will be detailed subsequently. In addition, the position of Manager of Data Processing Services, which is of extreme importance in any ADP operation, was held on a provisional basis from January 11, 1970, to June 30, 1972, by an individual who, according to personnel records, had no prior experience in the field of data processing. Despite holding the title, this employee did not function as Manager of Data Processing Services but rather, as Secretary-Receptionist and Administrative Assistant to the Registrar until retirement on the said June 30, 1972, date.

Unverified Data. One of the major problems at RMV is its inaccurate data base. This situation dates back at least five years and is recognized both by the data processing section and by the computer vendor, Control Data Corporation.

Legislation enacted in 1969 staggered motor vehicle registrations over a two year period instead of annually which required the registration master file to be constantly updated. This complicated the maintenance of this file for several reasons: non-information or misinformation on documents, failure to receive certain documents, and administrative decisions not to verify information.

While not much can be done under the present system to combat the problem of non-information, or misinformation, or failure to receive certain documents, a planned attack on data entry "throughput"\(^2\) could have reduced the potential inaccuracies to the data base.

For example, on several occasions when RMV has been confronted with huge backlogs of registrations, it has made administrative decisions to enter information into the computer data base without going through a verification process (re-keying). These decisions based on backlog rather than on operator proficiency are symptomatic of reactive decision making rather than planned decision making. Had RMV management instituted training programs and evaluation programs designed to raise the proficiency of data entry operators to a specified level, the impact of erroneous information on the data base would have been greatly reduced.

These deficiencies resulted in inaccurate updating transactions to the registration master file. In 1971, for example, the data processing section recognized that it had received approximately 50,000 such transactions and the problem was magnified with the implementation of the new Title Law in 1972.

These situations were brought to the attention of administrative officials at RMV, but little effort was made to correct them. In fact, there are over 500,000 inaccurate updating transactions which have been rejected by the computer. These are periodically resubmitted for processing in a registration update with the same result. Consequently, many remain unprocessed.

Organizing

Organizational Structure. An organization is "the pattern of ways in which large numbers of people, too many to have intimate face-to-face contact with all others, and engaged in a complexity of tasks, relate themselves to each other in the conscious, systematic establishment and accomplishment of mutually agreed purposes."\(^3\) While there has been much debate among organizational theorists over the structure of organizations, there is no argument over its need. Furthermore, it must be "both task-focused and person-focused and... have both an authority axis and a responsibility axis."\(^4\)

An organizational chart of RMV supplied by the Registrar of Motor Vehicles, with his admonition that it was not current, indicated that the data processing section reports directly to the Deputy Registrar for Administration. (See Appendix A). A survey of RMV revealed, rather, that this section reports directly to an Executive Assistant to the Registrar.

The organization chart also indicated that the data processing section is composed of two units: 1) Data Recorders and Tabulating, and 2) Computer and Deleaver. These titles are outmoded and the chart did not delineate the support functions attendant to data processing services.

The situation that exists is that the data entry function was removed in August, 1972, from the control of the data processing section at the direction of the Registrar and established as a separate entity. The Registrar contended that the separation of functions was necessary because that section had lost control of the data entry operation and that a tremendous backlog of transactions existed and was steadily increasing. Data processing management responded that the separation of functions was a major cause of the backlog and that efficiency and productivity would both be increased by returning the data entry function to the data processing section.

When the new data entry section commenced its operation as a separate entity, the responsibility for such operation was entrusted to an individual who was given the title of Chief Programmer and who, up to that point in time, served as the Budget Director of Traffic and Accident Records (RMV), a position totally unrelated to data processing operations. Without discussing the relative merits of whether a Chief Programmer is the person to be in charge of a data entry section, the fact remains that there is no evidence to indicate that the person so appointed had the background or experience to perform the duties required of a Chief Programmer nor that he possessed any experience in automatic data processing. He held this new post, however, from August 27, 1972, through December 31, 1973, when he vacated that position and assumed the temporary title of Administrative Assistant to the Registrar of Motor Vehicles, still continuing to exercise control over the data entry section.

Controlling

Input/Output Control. One of the general misconceptions concerning data processing involves the equating of overall system reliability with hardware reliability. Consequently, input/output control is an often overlooked, but nevertheless, essential element in the design of a data processing system. If properly designed and utilized, it will provide the capability to

\(^2\) Throughput" (def.) — The amount of data put through a process in a given period in order to produce useful information.


ensure that valid data enters the system, that all data is transcribed accurately, and that all erroneous data is detected and corrected promptly, and will prevent unauthorized or accidental changes to data files. The end result will be a reduction in or elimination of the wasteful use of manpower, machines, supplies and materials, and a control over any unauthorized use of information resources.

Such a program has traditionally been called an input/output control unit, or some other choice of words which connote data control, and has resided in the data processing group. Its primary responsibility is to maintain the quality and accuracy of information as it passes from the client, to the organization, to the computer and return. It fulfills its responsibility through the employment of various control techniques such as maintaining document registers, batching, validating or numbering, maintaining transmittal documents, verifying, developing hash totals and/or control totals, employing data checkers, sampling, maintaining up-to-date procedure manuals for manual and automatic operations, maintaining and verifying output distribution and reconciling all errors or differences prior to transmittal to the next group.

The Registry of Motor Vehicles had no such group charged with the responsibility of monitoring the interactions of man and machine, or controlling the flow of information within the organization. There were some attempts made within certain user groups at RMV to maintain control over the documents that flow within that group. However, there was no verification process from group to group.

In the data processing group, no attempt was made to reconcile the amount of money received with the number of documents processed, nor to verify that all documents received were processed, nor to process documents in sequence. Furthermore, there was no batching, there were no control totals in use, there were no procedures followed for reconciling differences, there was no record kept to indicate the flow of a document from receipt to storage. In effect, there was no viable audit trail.

It is understandable how, under the present modus operandi at RMV, 1500 stolen vehicle transactions could be lost for up to 15 months without any concern raised; and how the error rate on excise bills produced by RMV could be one out of every six; and how the incidence of "no response" messages to inquiries by local law enforcement officials continued to increase.

This has resulted in numerous complaints of unverified and erroneous data entering the data base; a marked increase in the number of "no response" messages to inquiries by local law enforcement officials; reported instances of large amounts of data that were not processed; an increased error rate in the production of motor vehicle excise tax bills; several instances of decisions being made by administrative management without exploring the implications such decisions would have on the processing system and resulting in the erroneous and/or non-processing of information; and, the granting of titles without knowledge of their validity.

Use of Consultants for Data Entry. The problem areas at RMV resulting from the lack of effective control and communication have proven costly. The inefficiency and poor productivity of the data processing operation caused the administration to conclude that it was necessary to engage the services of outside consultants in order to perform a basic data processing task—data entry.

During Fiscal Year 1974, RMV contracted with outside consultant firms to perform data entry services as follows:

<table>
<thead>
<tr>
<th>Approved</th>
<th>Vendor Name and Address</th>
<th>Max. # Records</th>
<th>Rate</th>
<th>Max. Amt. Authorized</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/27/73</td>
<td>Data Transcription Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P.O. Box 507</td>
<td>206,000</td>
<td>$116/M</td>
<td>$24,000.00</td>
</tr>
<tr>
<td></td>
<td>Herkimer, New York</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/17/73</td>
<td>Nesco Corp.</td>
<td>250,000</td>
<td>114/M</td>
<td>26,598.94</td>
</tr>
<tr>
<td></td>
<td>101 W. Hancock Street</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manchester, N. H.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/2/73</td>
<td>Data Transcription Inc.</td>
<td>1,000,000</td>
<td>189/M</td>
<td>189,000.00</td>
</tr>
</tbody>
</table>
It should be noted that the price per thousand records approved in the two requests for Data Transcription Inc., increased by 66 percent in a matter of seven weeks although the type of records to be processed was virtually the same in both instances. In requesting approval for the second contract with Data Transcription Inc., the Registrar advised the Purchasing Bureau:

This department has attempted to fulfill its keypunch needs by taking the in-house approach and the multicontract small-vendor route.

Each has resulted in failure. We were unable to cope with the volumes on an in-house basis and the small vendor does not have the equipment, personnel, financial resources, organization and production latitudes to properly service the Registry.

The system design of our computer dictates a need to be reasonably current on input in order to obtain optimum results from its use.

We are responsible for the production of millions of dollars in revenue for the state and the cities and towns and we cannot satisfy their needs with one arm tied behind our backs.

The following analysis of the productivity of the data entry section of RMV for the month of February, 1974, belies the Registrar's contention that RMV would be forced to operate "with one arm tied behind its back" if it had to fulfill its keypunch needs by taking a strictly in-house approach.

Data Entry Productivity — Analysis by the Post Audit Bureau. RMV uses several Inforex data entry units consisting of 75 data entry terminals. One of the benefits derived from the use of this type of equipment is a record of the time spent in the data entry function.

An analysis of the monthly operator statistics for February, 1974, showed that not more than 71 operators reported for work on any one day on the Inforex system during that month. This indicates that there were at least four terminals idled each day during the month.

In order to analyze the actual versus potential level of efficiency of the data entry function. it was necessary to determine the maximum amount of time available for data entry. Of the 71 full time day shift operators who logged in on the machines during the month, there were 64 who were full time employees during the entire month. In addition, there were 5 full time and 24 part-time night shift operators. In February, there were four complete weeks at 37-1/2 hours per week/per operator.

Day Shift
37-1/2 x 4 = 150 hours per month per operator
150 x 64 = 9600 hours available for data entry

Full-Time Night Shift
150 x 5 = 750 hours available for data entry

Part-Time Night Shift
20 x 4 = 80 hours per month per operator
80 x 24 = 1920 hours available for data entry

9,600 Available Daytime Hours
750 Available Full-time Night Hours
1,920 Available Part-time Night Hours
12,270 Total Maximum Available Hours

This is admittedly a maximum availability of hours. In order to make the available figures more realistic, the available hours were adjusted as follows:

<table>
<thead>
<tr>
<th>Less</th>
<th>Hours Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>613.5</td>
</tr>
<tr>
<td>10%</td>
<td>1,227.0</td>
</tr>
<tr>
<td>20%</td>
<td>2,454.0</td>
</tr>
<tr>
<td>Total 35%</td>
<td>4,294.5</td>
</tr>
<tr>
<td>Total Theoretical Hours</td>
<td>12,270.0</td>
</tr>
<tr>
<td>Less 35%</td>
<td>4,294.5</td>
</tr>
<tr>
<td>Total Available Hours</td>
<td>7,975.5</td>
</tr>
</tbody>
</table>

The actual time logged in by the data entry operators, as recorded by the Inforex system, was 5,813 hours. This represents only 47.3 percent of the theoretically maximum available hours, or 49.9 percent of the total theoretical available hours less holiday time. In other words, if theoretical available hours less holiday time is the criterion, data entry operators at RMV, on the average, spend less than half of their available time at the machine.

This analysis, however, recognized that people are not automatons and cannot be expected to sit at machines 100 percent of the time. A generous 35 percent of total available time was removed to compensate for such factors. The remaining 7,975.5 hours represent a reasonable standard for the month of February.

If the 7,975.5 hour figure is used as a reasonable standard, then let us inquire as to what could have been done with that time if it were used. The difference between the standard and the actual hours is 2,163 hours. The Registry has established that the average stroke rate for entry of RMV-1's* is 8,890 strokes per hour. They have also established, as a standard, that it takes approximately 90 strokes to enter each RMV-1. Therefore, one operator should be able to enter 8,890 divided by 90 = 97.8 documents per hour.

If these additional 2,163 hours were used by the data entry operators at RMV, an additional 211,541 RMV-1 records could have been processed. This converts to 2,538,479 records over a full twelve months. If we adopt the generally accepted industry standard that 65 percent of data entry time is spent on key-punching and 35

*Registry of Motor Vehicles — Title Forms — RMV-1.
percent on verification, then 1,650,023 additional records could be key-punched and verified by the present staff. In other words, the one million records contracted to an outside agency could be handled in-house by RMV at a saving of $189,000.

The ratio of actual machine time used to available time was 45.8 percent for day shift operators, 52 percent for part-time night shift operators. While the differences do not appear to be great, we should like to point out that, if the day shift operators improved their level of machine utilization to that of the night group, it would mean an increase in annual productivity of over 600,000 documents.

The results of the preceding analysis of the productivity of the RMV data entry function refute the agency’s assertions relative to its inability to handle its keypunch needs in-house.

**Computer Security and File Integrity.** Computer security and file (data base) integrity are essential control elements in a successful inquiry based data processing system. That these elements are present in the system at RMV is unclear.

Prior to entering into a contract with Control Data Corporation for the installation of the CDC-3300 computer, RMV had retained the services of a consultant to determine its needs in this field and prepare specifications for bid purposes. The contract was signed in December, 1970, and at approximately the same time, the consultant had inserted an advertisement in an insurance industry publication setting himself forth as the representative of a private business firm which had access to the RMV computer and its data. Previously, an article appeared in an edition of the same publication stating that a subsidiary of the said firm had linked its computer with that of RMV.

An attempt was made to verify the assertions contained in the article and the advertisement with respect to the then existing computer operation at RMV and the proposed system contained in the contract, with little success. It is doubtful that these assertions could have any relation to the then existing computer because it had little, if any, inquiry capabilities. Whatever application it did have would seem, of necessity, to relate to the proposed CDC-3300 computer.

In most inquiry-type computer systems, a program, referred to as an activity monitor, is provided that will track the activity associated with the system. The use and effectiveness of such a monitoring program is dependent upon the degree of security consciousness in a computer installation. In secure installations, monitors might include the following types of information: location identification; name of authorized person requesting information; purpose of inquiry; authorization level (i.e., security clearance); and, identification number. Most of this information would be used by a computer program to determine if the person and the station have been granted authorization to use the information requested. The function of the monitor is to simply keep a record of the transaction. Later, at predetermined intervals, a printed copy is made of all transactions to be used either as a check on activity, or as an audit tool.

The monitor on the RMV computer is a basic monitor containing only date and location information. Shortly after its installation, the monitor was removed from operation ostensibly because it interfered with regular processing activity. This decision was made by the Manager of Data Processing without consultation with or approval from his superiors. Consequently, the Supervisor of Data Processing and the administrative hierarchy at RMV did not know that the monitor was rendered non-functional, nor did they question the lack of reports which should have been produced by the monitor. Management never questioned the lack of such reports which indicates that there is little concern as to who has access to the RMV computer and its data, for how much time, or how often.

**System Deficiencies Affecting the Title Division.** A major complaint voiced by most users of the ADP system at RMV is that reports that are received are neither timely nor accurate. This shortcoming particularly affects that agency’s Title Division.

The data processing section is required to provide printouts each week to the Title Division containing the following information: vehicles for which title applications have been filed, those vehicles which are listed in the registration master file as stolen or previously titled, and those vehicles with valid titles. These print-outs are not provided in a timely manner with delays constituting the rule rather than the exception. The delay in April, 1974, had exceeded seven weeks and resulted in the issuance of between 70,000 and 80,000 titles without proof of validity.

This was the second instance in which this procedure was followed. In 1972, shortly after the Title Division became operational, the backlog of work at the RMV data entry section was excessive and approximately 10,000 titles were issued without proof of validity.

Estimates vary as to the number of invalid titles that have been issued with the Title Division assessing blame on the data processing section and vice versa. Whatever the relative merits of the cross complaints, there is a lack of formalized procedure between the two units and few, if any, controls exist.

**Communication**

*Intra-Agency Communication.** Various studies have indicated that managers, depending on their level within the organization, spend as much as 70 percent of their time communicating. A recent study indicated that approximately one-quarter of the respondents spend between 26 and 50 percent of their time in each of the following categories: coordinating within their own...
department, coordinating with other departments, and motivating others. In addition, one-half of the respondents spent between 10 and 25 percent of their time in each of these communications activities.2]

The lack of effective communication between the administrative hierarchy and data processing management is a well-known fact of life at RMV and has existed for over two years. Both sides admit to its existence but little, if anything, has been done to ameliorate the condition.

Data processing management, dating back to 1972, has availed itself of the use of memoranda to advise administrative officials of critical problem areas and their effect upon law enforcement agencies and municipalities. In addition, recommendations have been transmitted but there is no evidence to indicate any administrative response.

When such a communication problem exists, it follows that data processing management will be unable to carry out some of its most basic functions — coordinating and motivating.

There has been little coordinating done by data processing management at RMV. There has been no attempt by data processing management to educate user agencies as to the benefits of the system or its operational complexities. While there are some operating manuals in existence, they fail to satisfy as a substitute for the educational process. In addition, the actions of administrative management in working around rather than with data processing management nullified any incentive to undertake motivational activities.

This lack of communication capability between the data processing section and other groups is implicit in most of the information processing problems encountered at RMV.

Inadequate Auto Theft Records. Communication problems, of the type just discussed, existed between the data processing section and other RMV units which must utilize the output of the computer system. One of the units seriously affected is the agency's Title Division. This division is charged with the responsibility of issuing valid certificates of title to owners of motor vehicles and relies heavily upon data processing services. It is essential that this division have access to a current file on auto theft information in order to be of assistance to law enforcement agencies.

The usual procedure is to enter all information relating to stolen vehicles through an on-line terminal located within the auto theft section of the Title Division. For entry purposes, the name of the owner, the registration number, and the vehicle identification number on the stolen vehicle transaction must correspond to an already existing record in the registration master file. If there is an error in any of these variables, a "no match" situation occurs and the transaction is rejected. Such a "no match" situation would occur, however, if the stolen vehicle was unregistered or registered in another state. To compensate for this, an alternative method of processing such a transaction has been designed whereby a "dummy" record can be created in the registration master file which would indicate "NOTREG" or "OUTSTA," as the case may be, with respect to unregistered or out-of-state vehicles stolen in Massachusetts.

During the course of this study, the Post Audit Bureau staff discovered approximately 1500 stolen vehicle transactions in cardboard boxes on a table adjacent to the on-line terminal. Samples of these were analyzed to determine whether they came within the "NOTREG" or "OUTSTA" categories. All did and, furthermore, all the information required for a proper entry was included. These had never been entered into the computer data base and some dated back 15 months.

Subsequently, these transactions were forwarded to the data processing section without being keypunched in order to determine whether they were processable. No such determination was made and a review five weeks later indicated that they remained unprocessed.

Another cause for concern with respect to the auto theft section is that it often experiences a time lag in the updating of its files. This occurs because the systems design of the RMV computer precludes the use of the auto theft section terminal for updating purposes during the period in which the registration master file is being up-dated. The latter has been known to take as long as three weeks. In point of fact, this section has had, on the average, only ten hours per week available to it in which to enter information into the computer and is two to three months in arrears in this area of operations.

This situation is symptomatic of the lack of communication, management control, and concern that exists at RMV and serves to denigrate that agency's stated data processing objective of creating an accurate current data bank which will provide immediate answers to inquiries.

IMPACT UPON LAW ENFORCEMENT AGENCIES
IV. IMPACT UPON LAW ENFORCEMENT AGENCIES

The computer information system operated by RMV and to which most law enforcement agencies (city, county, state and federal) in the Commonwealth of Massachusetts have access, is entitled "Driver Registration Information and Vehicle Enforcement System." It is commonly referred to as DRIVES and may be described as a large scale, random access, telecommunications computer system.

The explanation of the terms used to describe the system is as follows:

Large Scale — the system is designed to maintain large volumes of accurate information including over three million registration records and approximately four million operator license records.

Random Access — the system is designed to provide virtually instantaneous retrieval of information concerning any of the records it contains.

Telecommunications — the communications network which ties all users directly into the computer through terminals located in the users’ offices.

The system is designed to be operational 24 hours a day, 7 days a week, and first became functional in April, 1972. Information in the system is available to RMV branch offices directly through terminals located in those offices and to approximately 180 other law enforcement agencies throughout the state through the Law Enforcement Agencies Processing System (LEAPS) which is operated on a twenty-four hour basis by the Massachusetts Department of Public Safety.

A manual recently issued by the Department of Public Safety defines the purpose of LEAPS as follows:

a) serve all levels of law enforcement giving top priority to the officer on the street, and

b) provide accurate up-to-date information quickly enough to be useful in critical situations.

While there is little, if any, criticism directed at the LEAPS program by law enforcement agencies, a like situation does not exist with respect to the DRIVES program. The role which the latter plays in the total information system for law enforcement is that of providing quickly and accurately:

a) Registration Information — inquiries received and answered by registration plate number, by name and address, or by vehicle identification number.

b) License Information — inquiries received and answered by license number, by name and date of birth, or by name and address.

In order to accomplish its goals, DRIVES must satisfy two major criteria of data processing communications system — reliability and speed. This it has failed to do.

Complaints about the program have emanated both from RMV branch offices and other law enforcement agencies. Officials at the former estimated that, at a minimum, they received a “no-response” answer on twenty percent of their inquiries. This indicates either that the vehicle record has not been entered into the computer’s data base or that if it has, some portion of the information is erroneous. This has become a cause for concern and a source of embarrassment to branch office personnel and at least one such office has begun to manually maintain a duplicate vehicle index file of its own transactions in order to be able to answer inquiries.

The reaction of the other law enforcement agencies who have accessibility to DRIVES was ascertained by means of a questionnaire (See Appendix B). The agencies were requested to evaluate the program in terms of timeliness and accuracy of response. Of 144 such agencies contacted, 120 (83%) responded.

The responses from these agencies indicate that DRIVES, especially in the area of timeliness, is not fulfilling its purpose.

Table IV
Law Enforcement Questionnaire Responses

<table>
<thead>
<tr>
<th>TIMELINES</th>
<th>ACCURACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>10.0%</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>27.5%</td>
</tr>
<tr>
<td>Average</td>
<td>21.0%</td>
</tr>
<tr>
<td>Unsatisfactory</td>
<td>25.5%</td>
</tr>
<tr>
<td>Poor</td>
<td>16.0%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Even those agencies reporting “excellent” results were, in many instances, referring to the LEAPS program at the Department of Public Safety and not the DRIVES program at RMV. This is evidenced by the additional comments included in addition to the above categorical evaluations.

The major complaint concerned the subject of timeliness of information. Many were concerned that new registrations were not being made available within what was, in their opinion, a reasonable period of time. They advised that a time lag of three to six months ensued between the effective date of a registration and the date of entry into the computer’s data base.
Other complaints issued by the law enforcement agencies included:

- Outdated information is allowed to remain in the computer.
- DRIVES is shut down frequently and remains inoperative for lengthy periods of time.
- Information received must be further verified.
- Inability to obtain new registration listings.

The most comprehensive critical evaluation of DRIVES was offered by the Department of Public Safety which, as stated, operates the LEAPS system. This agency complained that:

(a) New registration data entered within the previous six (6) to eight (8) weeks is unavailable to LEAPS users.
(b) License renewal data entered within the previous four (4) to six (6) weeks is unavailable to LEAPS users.
(c) Input queries from SP cruisers on operational status, subject to numerous response delays during each 24 hour period.

(d) Registration data on stolen vehicles is not adequately purged during those periods when new plate issuance occurs.

(c) Primary need is expedient update of registration and license data upon issuance.

Further responding, the Department of Public Safety stated: “Our communications people feel that there are many shortcomings in the ongoing operation of the Registry system, and that may improvements could be achieved in this viable and necessary segment of the computerized law enforcement network.”

This position is buttressed by the fact that the police departments of the two largest communities in the Commonwealth, Boston and Springfield, rated DRIVES as less than satisfactory both as to timeliness and accuracy.

The data processing communications system at RMV has not accomplished its purpose and, as a result, the overall effectiveness of law enforcement agencies which rely upon it for timely and accurate information has been impaired.
IMPACT UPON MUNICIPALITIES — EXCISE TAX REVENUE LOST
V. IMPACT UPON MUNICIPALITIES — EXCISE TAX REVENUE LOST

The receipts of the excise tax assessed upon motor vehicles accrue to the municipality in which the registrant is domiciled. The billings, however, are created by RMV through its data processing operation and that agency is compensated for this service. Just as the fragmented management of this system has been detrimental to RMV branch office personnel and law enforcement agencies, so has it also resulted in the loss of tax revenues to several cities and towns in the Commonwealth.

An analysis revealed that possibly as many as 40,000 motor vehicle registrations for 1972 were never processed. These consisted only of vehicle registrations which had an alphabetic character in the second position of the six digit registration number.

This situation came to light as the result of inquiries to local city and town officials and to RMV by vehicle owners who had not received excise tax bills for 1972. Upon so inquiring, they were advised, after a search of the records, that their registrations were not in the registration files. Many 1974 renewals of the 1972 registrations in the same numeric series resulted in a “NO-MATCH” response when they were processed through the computer. These events depict the lack of quality control over data input to the RMV computer data base and have proven costly to the Commonwealth’s cities and towns and their real estate taxpayers.

The costly effect of this inefficiency in ADP services is highlighted by the following excerpt from the Report of the Assessors of Taxes included in the Annual Report of the Town of Milton for 1972:

Because of the misadministration of the 1972 automobile excise tax, at the State level, our estimated receipts will be approximately $140,763.16 lower. This is as a result of Milton not receiving some 4500 bills in the year 1972.

The Assessors Office for the Town of Watertown indicated that billings for 1972 were $66,000.00 less than in 1971 and additional decreases resulted in 1973. This despite the fact of increased registrations.

With reference to excise tax receipts, the Mayor of Quincy, in January, 1973, stated publicly: “Slow action on the part of the Registry of Motor Vehicles is adding $4 to the tax rate and it looks as though the situation will be getting worse.” The City of Quincy received 8,447 fewer bills in 1972 than in 1971, creating a loss in city revenue of $400,000.00. This loss is reflected in the rising property tax rate. The City Treasurer had estimated that RMV should have sent out 55,197 excise tax bills to Quincy residents in 1971, whereas only 44,923 went out; and in 1972, only 36,476 went out.

In addition to those excise tax bills which are not sent out, a very large number of erroneous bills are sent out which causes additional administrative problems to local city and town officials. According to the Assessors Office for the City of Quincy, an average of 6,000 to 7,000 erroneous billings are expected in a normal year. In 1973, however, this figure increased to approximately 12,000 such billings. All of these errors must be examined, investigated and resolved and this results in an increased workload in the Assessors office.

According to figures compiled by the Treasurer for the City of Quincy at the request of the Post Audit Bureau, that community has incurred an extra cost of borrowing in excess of $100,000.00 over the past three years because of the delay on the part of RMV in providing the City with its excise tax bills. In addition, the Treasurer for the Town of Wellesley estimated that the delay in receiving excise tax billings in 1972 from RMV cost the town approximately $20,000 in interest charges for that year.

In an attempt to determine the scope of the RMV problems relative to 1972 excise tax billings, the Post Audit Bureau selected eleven cities and towns throughout the Commonwealth at random and compared the billing figures for 1971 and 1972. (See Appendix C).

The figures indicate that, for these eleven cities and towns, there was a total decrease in the number of excise bills produced in 1972. The figures also indicate that while the number of bills sent out decreased, the number of erroneous bills increased (i.e., the difference between the number of excise tax bills sent out and the number credited to the local community by the Department of Corporations and Taxation).

For the eleven communities sampled, the errors increased from 69,448 (1 out of every 9) in 1971 to 100,332 (1 out of every 6) in 1972. The figures for 1973 were incomplete at the time of this report but tentatively indicated that the number of billings is increasing. A repetition of the error rate, however, remains a likelihood.

Between 1951 and 1971, the average yearly increase in the production of excise tax bills (total registrations) was 83,334. For 1971, RMV produced 3,813,180 tax bills. For 1972, it produced only 3,782,308 excise tax bills. If the average yearly increase in registrations is added to the 1971 figure, we can estimate that there should have
been 3,896,514 excise tax bills produced for 1972 — a difference of 114,206 bills. This represents $5,367,682 of potential revenue lost to the cities and towns for 1972*. The Post Audit Bureau has determined that 22,116 of the 1972 excise tax bills were not produced until 1974 and that a subsequent administrative decision was made not to bill any further 1972 registrations even though RMV admits that there are “some” that have not been billed.

From these figures it is clear that delays and other problems associated with the administration of the excise tax program at RMV are costing the taxpayers of the Commonwealth millions of dollars each year in increased borrowing costs and/or lost revenue. This has been reflected in increased property tax rates. Based on the figures on borrowing costs supplied by the Treasurer of the City of Quincy ($100,000.00 over the past three years) and his estimate that approximately one sixtieth of the registered vehicles in the Commonwealth are registered in Quincy, it can be concluded that extra borrowing costs throughout the Commonwealth as a result of excise tax billing delays approximate $2,000,000.00 per year.

*Based on the average excise tax bill for 1972 according to RMV records.
FINDINGS
AND
RECOMMENDATIONS
FINDINGS AND RECOMMENDATIONS

Findings:

1. The cost of data processing at the RMV for fiscal year 1974 was approximately $2,000,000 which represents a cost/budget ratio of 9.20 percent. This deviated significantly from statistics established by studies of organizations of the relative size of RMV which showed median cost/budget ratios of 0.90 percent.

2. Since 1968, expenditures for data processing have increased 162.80 percent and the number of data processing personnel has increased by 94.50 percent, while effectiveness, in terms of service to law enforcement agencies, and to municipalities in the preparation of motor vehicle excise tax bills, has deteriorated.

Recommendations:

a) The Secretary of Public Safety should conduct a complete review of the RMV data processing system to determine the need for, and the implications of, a complete redesign of this system. Together with this effort, the Secretary should investigate the feasibility of transferring the computer processing requirements of RMV to the computer located at the Department of Public Safety.

b) The Registry of Motor Vehicles should determine the feasibility of alternate methods and forms of data entry. This would include the use of on-line data entry either from the branch office or the data processing section, the use of turnaround and OCR (Optical Character Reader) documents and the use of vico terminals which would reduce the over-reliance on manual forms of data entry.

Findings:

3. There was no long range ADP planning at RMV. Data processing activities were approved by the Registrar after consultation with a short range planning group which was established by him but which did not include top level management in the data processing section.

4. A lack of communication, which approached conflict, existed between the administrative hierarchy and data processing management which resulted in the former altering or modifying procedures and systems without the knowledge of the latter.

Recommendation:

An overall planning group should be established including top level management of both the administration and the data processing section. This group would serve to coordinate activities between the two segments and promote the objectives of the system. At the same time, it would dispel the lack of communication existing between them.

Finding:

5. No formal or in-house training program for data processing personnel existed at RMV nor was there any evidence that funds were requested for such training programs during the past three years. Consequently, the Agency had almost total dependence on the computer vendor for systems and programming changes with resultant additional expense.

Recommendation:

A substantive training program should be established for ADP personnel.

Finding:

6. By administrative directive, original registration forms are accumulated over a period of time and forwarded to consultant firms for keypunching while registration change forms are keypunched in-house soon after they are received. This results in many instances of data being changed to reflect outdated information and out of sequence transactions being entered into the computer. This inevitably causes erroneous information to be included in the data base. Instances exist where multiple divergent records have been created in the computer for a single vehicle.

Recommendation:

The procedure in the systems design which required the sequential processing of all transactions should be followed, especially in the case of those transactions affecting the registration master file.

Finding:

7. Key data processing positions have been filled on a provisional basis with employees whose personnel records indicate no evidence of any background or experience in data processing.

Recommendation:

This practice should be terminated and these positions filled in accordance with qualifications approved by the Division of Civil Service.
Finding:

8. A fragmented data processing operation exists at RMV in that the data entry section has been removed from, and operates independently of, the data processing section.

Recommendation:

The Registrar of Motor Vehicles should immediately review the decision to segregate these units and re-evaluate it from the standpoint of coordination of activity and control.

Findings:

9. Less than adequate usage of data entry machines by RMV personnel has necessitated the contracting with outside firms for the keypunching of records, a basic element in an automatic data processing system.

10. An analysis of data entry machine utilization at RMV revealed that, if data entry personnel had used their machines sixty-five percent (65%) of available time, all such records could have been produced in-house at a saving to the Commonwealth in excess of $200,000 per year.

Recommendation:

Keypunch operators and machines should be utilized to maximum capacity to avoid the necessity of contracting with outside firms to provide basic data processing services. Savings realized from such maximum utilization might be used for personnel training purposes.

Finding:

11. Some transactions involving stolen vehicles have never been entered into the computer data base while others have been delayed for extended periods of time because of computer system design deficiencies.

Recommendation:

A formalized procedure should be established whereby information concerning stolen vehicles will be promptly entered into the computer data base. In addition, the auto theft section of the Title Division should be provided with the capability for updating the registration master file with stolen vehicle information on an "on-line" basis as often as needed to keep the file current.

Finding:

12. Thousands of certificates of title have been issued without knowledge as to their validity.

Recommendation:

The procedure, already established, for the issuance of certificates of title to motor vehicles should be adhered to and the Title Division precluded from any such issuance until validity has been determined. To do otherwise, serves to defeat the purpose of the title law.

Finding:

13. Computer security was lacking and file integrity could not be determined because of the arbitrary removal of the security monitor on the computer by data processing management.

Recommendation:

The activity monitor program, with which the computer is provided and which records "on-line" inquiries to the registration master file, should be reactivated immediately to insure accessibility to data base information only to authorized user groups.

Finding:

14. Law enforcement agencies within the Commonwealth, including branch offices of RMV, who have access to and rely heavily upon the Registry computer system (DRIVES), have been severely hindered in the exercise of their responsibilities because of untimely and erroneous responses to inquiries for vehicle and/or owner information on the one hand, and the lack of response on the other.

15. The majority of such law enforcement agencies have indicated less than satisfaction with computer responses to their inquiries.

Recommendation:

Consistent with previous recommendations and as part of an overall systems review, consideration should be given to the design and construction of a new registration master file to identify and eliminate errors which exist in the current file. Since the total registration cycle covers a two year period, the new file would not be completed until that period had expired. Should this recommendation prove feasible, a dual maintenance system would be required during the time in which the new registration master file was being constructed.

Finding:

16. Cities and towns in the Commonwealth, in 1972, lost more than $5,500,000 in excise tax revenue
and were compelled to borrow in order to meet current operating expenses. This was caused by system problems and data base errors in the RMV computer and resulted in the municipalities incurring additional costs for borrowing. Over 22,000 motor vehicle excise tax bills for 1972 were not produced until 1974 while an estimated 110,000 excise tax bills for that year were never produced. In addition, billings for 1973 are not yet complete.

17. The error rate in billings for 1971 motor vehicle excise tax was one in nine. This rate increased to one in six for 1972 billings.

Recommendation:

a) Pending the design and construction of a new registration master file, the feasibility of removing excise tax data from the existing registration master file and maintaining it on a serial tape file should be determined.
Questionnaire

With respect to the experience of your department in obtaining responses concerning vehicle registrations, stolen vehicles, title verification, and operator license data from the Registry of Motor Vehicles’ computer through your terminal, would you kindly indicate your appraisal of this system. Please check the appropriate term in each of the following question.

1. In terms of accuracy of information, which of the following best describes the service which your department has received:
   EXCELLENT
   SATISFACTORY
   AVERAGE
   UNSATISFACTORY
   POOR

2. In terms of timeliness of information, which of the following best describes the service which your department has received:
   EXCELLENT
   SATISFACTORY
   AVERAGE
   UNSATISFACTORY
   POOR

3. Any Additional Comments (Use other side if necessary):
<table>
<thead>
<tr>
<th>Town</th>
<th>a.)</th>
<th>b.)</th>
<th>c.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELMONT</td>
<td>18,683</td>
<td>15,767</td>
<td>2,916</td>
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<td>BOSTON</td>
<td>252,775</td>
<td>229,174</td>
<td>23,601</td>
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<td>27,106</td>
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<td>FITCHBURG</td>
<td>28,951</td>
<td>25,301</td>
<td>3,650</td>
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<td>LYNN</td>
<td>51,495</td>
<td>45,720</td>
<td>5,775</td>
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<tr>
<td>MILTON</td>
<td>19,120</td>
<td>16,386</td>
<td>2,734</td>
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<td>NEW BEDFORD</td>
<td>58,718</td>
<td>52,622</td>
<td>6,096</td>
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<td>PITTSFIELD</td>
<td>39,912</td>
<td>35,043</td>
<td>4,869</td>
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<tr>
<td>QUINCY</td>
<td>55,508</td>
<td>48,649</td>
<td>6,859</td>
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<tr>
<td>WATERTOWN</td>
<td>24,172</td>
<td>20,457</td>
<td>3,715</td>
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<tr>
<td>TOTALS</td>
<td>622,925</td>
<td>553,477</td>
<td>69,448</td>
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</table>

a.) No. of excise tax bills generated by R.M.V.
b.) No. of excise tax bills credited by Dept. of Corporations and Taxation.
c.) Incorrect Billings.
Honorable Gerald P. Lombard, Chairman  
Committee on Post Audit and Oversight  
Room 146, State House  
Boston, Massachusetts

Dear Mr. Chairman:

We appreciate the opportunity to respond to the report of your committee that was prepared as the result of a review of the data processing system in the Registry of Motor Vehicles.

Members of the Registry's staff have previously consulted with you in reference to the factual contents of the report so that this reply will not be addressed to matters that have been orally presented on a previous occasion. At this time, we wish to submit the following comments to your committee:

Cost/Budget Ratio

We would like to point out that the cost/budget ratio referred to in your report cannot apply to the Registry of Motor Vehicles because of the nature of the function of this department. The original computer system was installed in 1962 primarily for the preparation of excise tax bills which are the responsibility of the Department of Corporations and Taxation.

A large portion of the expenditure of our budget is solely incurred because of this excise tax problem. Additional machines, personnel, programs, space and supplies are dedicated to this system.

In addition, because of the Commonwealth being a compulsory insurance state, the extra work necessitated because of this statute increases the cost which would not make valid the cost/budget ratio.

The performance of our Data Processing Section does not properly reflect its productivity. The test month used in the report was between 30 and 100 days after the system had been installed and the work days were less than normal because of snow storms during that month. In addition, there were five IBM 129's the work of which was not reflected in the test data examined by the analyst.
It should be pointed out that in the fiscal year 1968, the Registry owned a medium-scale computer system (GE 415) capable of providing only batch processing activities. The computer system was operational two shifts a day for five days a week. All motor vehicles were registered January 1 on each year and not on a staggered monthly basis. Inquiries were answered via the computer printer, and in some instances answers were not received for several days.

By fiscal year 1974, however, the Registry had increased its hardware to include a large scale computer system (CDC 3300) capable of providing immediate response to inquiries from all law enforcement agencies and Registry of Motor Vehicles District Offices via 64 remote terminals leased by the department. The CDC 3300 and the GE 415 computer systems are now operational 24 hours a day for seven days a week.

Organizational Structure
We concur with the recommendation that the Data Processing Section should be under the supervision of the Computer Manager. The individual who served as the supervisor of that section at the time your report was written did have experience and the qualifications to head this section. He had previously been the Director of our Traffic Records Project which was a keypunching system eventually resulting in computerized records of the location of all accidents in the Commonwealth. This system was the first totally mechanized traffic record system in the nation. This employee has served as a participant in the National Highway Safety Committee's Conference on Traffic Records.

Planning and Personnel Training
We do concur with the recommendation of the report and have established a training plan for the department. Also, we have requested consultant services to train both the programmers and operators in the department.

Communications
We do not concur that computer personnel were not involved in decisions being made concerning the computer installation. Experienced computer personnel had been involved in staff decisions from the original planning stage in 1969 until the system was fully implemented in 1973. When major problem areas were discovered in the system, the division of responsibility became apparent solely because administrative changes in the system were required that did not involve data processing personnel.

A new chain of command has been established, completely incorporating all the data processing management personnel in the administrative structure so that the decisions on the on-going functions of the department are thoroughly reviewed and acted upon.
Unverified Data

The department had a tape drive computer which operated the excise tax program for several years and with the implementation of the random access computer the decision was made to add the current excise tax records to this new computer. The error rejects that the agency has experienced have now been cleared. Through a new error-correction section, which has been able to identify the source of errors, administrative procedures have been established for their discovery and correction.

Computer Security

The activity monitor program is in existence and is used periodically to establish the norm for the use of terminals. With the period of time that the system is active, the agency is able to determine the norm for all the terminals and by spot-checking, use deviation from the norm is easily discernible.

Input-Output Control

We concur with the recommendation in the report and have established an Audit Control Section for the purpose of verifying data control.

Excise Tax Bills

We do not concur with the conclusion arrived at in the report concerning excise tax bills on a year-to-year basis. The registration cycle will cause excise tax bills of a previous year to be prepared in subsequent years which will not completely reflect the number of vehicles registered in any one calendar year. This carryover will result in a variance on year-to-date comparisons.

Further, we do not concur with some of the statements contained in the report which are attributed to certain municipal officials. As an example, the City Treasurer of Quincy is quoted as saying: "That the Registry of Motor Vehicles should have sent out 55,197 excise tax bills to Quincy residents in 1971 whereas only 44,923 went out." Records in this agency show that the Registry of Motor Vehicles sent out 55,508 excise tax bills to Quincy in 1971.

He is further quoted as saying "that in 1972 only 36,476 bills went out", where-as our records show that 54,225 bills were sent out to Quincy in 1972.

Progress

The department did engage the services of the Dynamics Research Corporation to conduct a review of the agency's electronic data processing systems, data
processing equipment and administrative systems and procedures. As a result, a report of the survey was submitted which incorporated fifteen recommendations, all of which are in the process of being implemented.

Very truly yours,

E. Theodore Gunaris
Acting Registrar

cc: Charles V. Barry
    Arthur C. Cadegan
    Robert C. Capasso
    Louis R. Pleau
    Joseph P. Mahoney
    George H. Dooley
EVALUATION OF AGENCY RESPONSE
EVALUATION OF AGENCY RESPONSE

Prior to the publication of this report, the Post Audit and Oversight Committee reviewed the findings of the Legislative Auditor with officials of the Registry of Motor Vehicles, including Registrar David J. Lucey, and invited comments.

In the interim, the term of Registrar Lucey expired and he relinquished the office. An Acting Registrar was designated who availed himself of the opportunity to present the agency’s response vis-a-vis the report of the committee. The committee is happy to include the comments of Acting Registrar E. Theodore Gunaris in this report in the interest of full public discussion and the ultimate improvement of public service.

The agency’s response, while categorized, touches upon selected highlights and should be carefully considered both in its own terms and in conjunction with the full text of the report. Accordingly, there are a few issues raised in the response which require our comment.

Cost/Budget Ratio. The agency states that the cost/budget ratio used cannot apply to the Registry of Motor Vehicles because of “the nature of the function of this department.” The nature of the function is left unexplained and, consequently, the reason why such ratio would not apply. Factually, the figures used are general figures which can be applied to any organization and can be utilized on a comparative basis to analyze the relative effectiveness of a data processing operation.

The agency likewise states that “a large portion of the expenditure of our budget is solely incurred because of this excise tax problem. Additional machines, personnel, programs, space and supplies are dedicated to this system.” This is indicative of the agency’s misunderstanding of its data processing problems. The excise tax function, in a properly designed and operated registration system, should be merely a by-product, available at minimal extra cost or effort.

The agency contends that, because the Commonwealth of Massachusetts is a compulsory insurance state, its workload has increased which invalidates the cost/budget ratio figures. No explanation or substantiation has been given for this statement.

The agency contends that the productivity analysis of the data processing section is not truly reflective of its productivity because the test month used was between 30 and 100 days after the system had been installed and the work days were less than normal because of excessive snow storms. In addition, the agency complains that there were five IBM 129’s, the work of which was not reflected in the test data. In the first instance, our analysis was made of the data entry section and not the data processing section as a whole. Secondly, the choice of month to be used for test purposes was left to the agency who provided information for the month of February, 1974; and all statistics concerning employees who were identified as operators working on the IBM 129’s were purposely excluded from our analysis.

There is no argument with the agency’s statement that its computer systems are now operational 24 hours a day for seven days a week. The problem concerns the quality of the responses which, as has been detailed in this report, is less than satisfactory. In fact, the Department of Public Safety, at the request of the Post Audit Bureau, conducted an analysis of its requests and the responses received from the Registry computer during the one week period December 19-26, 1974. This analysis revealed that of 16,385 requests 3,530 resulted in a “no response” message.

Organizational Structure. The agency states that they concur with the recommendation that the data processing section should be under the supervision of a computer manager. This indicates a misconception on the part of the agency because no such recommendation was made. Our recommendation was that the action of the Registrar in removing the data entry function from the data processing section be reconsidered with a view toward unifying the data processing operation.

With respect to the remainder of the response in this section, we must observe that the individual involved did not supervise the data processing section but rather, as noted in the report, served as the supervisor of the data entry section which had been removed from the data processing section. We must also point out that the personnel records of the agency indicate that this individual, at the time of his appointment, had no background and/or experience in data processing.

Communications. The agency disagrees with the finding in the report that computer personnel were not involved in decisions being made concerning the computer installation and contends that experienced computer personnel had been involved in staff decisions from the original planning stage in 1969 until the system was fully implemented in 1973. In the first instance, the report did not concern itself with the circumstances leading up to the installation of the CDC-3300 computer but rather with its operation. Secondly, the agency’s statement belies its own contention because it admits that a new chain of command has been established incorporating all data processing management personnel in the administrative structure for decision making purposes.
Computer Security. The agency states that the activity monitor program is in existence and is used periodically to establish the norm for the use of terminals. This program was not in operation during the course of the study and had not been for an extended period of time. In addition, the purpose of the activity monitor is two-fold. To establish norms is one function. The other is to determine who is accessing the file. This cannot be determined if the use of the monitor is intermittent.

Excise Tax Bills. We are unable to determine the basis for the agency's non-concurrence in this instance. An analysis of the conclusion section of the report reveals no such discussion.

With respect to the agency's non-concurrence with the figures used in the report for the City of Quincy, we reply that the source of the figures was the records of the Assessors Office for the City of Quincy and these were verified.