# Study of Police Management Information Systems

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by

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# STUDY OF POLICE MANAGEMENT

#### INFORMATION SYSTEMS

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#### CURRENTLY AVAILABLE

CLARK, Lorenne M.G. and ARMSTRONG, Simon

<u>A Rape Bibliography, with Special Emphasis on Rape Research</u> <u>in Canada</u>. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1979. (130 pages, Cat. No. JS22-50/1979).

CUNNINGHAM, J. Barton and McINNES, Charles I.

<u>Community Program Evaluation: A Suggested Approach</u>. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1978. (185 pages, Cat. No. JS32-1/6).

ENGSTAD, Peter and LIOY, Michèle, Editors

<u>Report of the Proceedings.</u> Workshop on Police Productivity and Performance. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1980. (326 pages, Cat. No. JS22-52/1980E).

HANN, Robert G.

Deterrence and the Death Penalty: A Critical Review of the Econometric Literature. Ottawa: A Ministry of the Solicitor General Research Division Report published by the Department of Supply and Services, 1977. (64 pages, Cat. No. JS32-1/5). Price: Canada - \$2.50; Other countries - \$3.00

LEVENS, Bruce R., and DUTTON, Donald G.

The Social Service Role of the Police - Domestic Crisis Intervention. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1980, (240 pages, Cat. No. JS22-55/1980E).

MCKAY, H. Bryan, JAYEWARDENE, C.H.S. and REEDIE, Penny B.

The Effects of Long-Term Incarceration and a Proposed Strategy for Future Research. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1979. (125 pages, Cat. No. JS22-48/1979).

MOYER, Sharon and HARRIS, S.B.

Self-Evaluation in Community-Based Residential Centres. Volume 1: Guide. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1978. (85 pages, Cot. No. JS42-5/1978-1).

Volume 2: Prospects and Pitfalls. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1978. (198 pages, Cat. No. JS42-5/1978-2). MOYER, Sharon

Diversion from the Juvenile Justice System and its Impact on Children: A Review of the Literature. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1980. (201 pages, Cat. No. JS22-54/1980E).

RIZKALLA, Samir, BERNIER, Robert and GAGNON, Rosette

Bibliographical Guide: The Economics of Crime and Planning of Resources in the Criminal Justice System. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1978. (488 pages, Cat. No. JS22-45/1978).

SCARFF, Elisabeth, ZAHARCHUK, Ted, JACQUES, Terrence and McAULEY, Michael

Evaluation of the Canadian Gun Control Legislation. First Progress Report. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1981. (248 pages, Cat. No. JS22-56/1981E).

SHEARING, Clifford, D., LYNCH, Jennifer, and MATTHEWS, Catherine J.

Policing in Canada: A Bibliography. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1979. (362 pages, Cat. No. JS22-51/1979).

STANLEY, Paul R.A.

Crime Prevention Through Environmental Design: A Review. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1977. (57 pages, Cat. No. JS22-43/1977).

STENNING, Philip C.

Firearms and The Private Security Industry in Canada. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1979. (114 pages, Cat. No. JS22-49/1979).

WASSON, David K.

Community-Based Preventive Policing: A Review. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1977. (198 pages, Cat. No. JS22-42/1977).

ZAHARCHUK, Ted and LYNCH, Jennifer

<u>Operation Identification - A Police Prescriptive Package</u>. Ottawa: A Research Division Report published by the Communication Division, Ministry of the Solicitor General, 1978.

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# STUDY OF POLICE MANAGEMENT INFORMATION SYSTEMS

## ADMINISTRATIVE ABSTRACT

The study was conducted over one and one-half years of elapsed time. Its major objective was to formulate a general catalogue of procedures to assist Canadian municipal police forces who wish to develop improved management information systems.

Management information systems (M.I.S.) can be defined as "a set of procedures for capturing, storing and displaying information so that it can be delivered to the appropriate individuals in the organization -- to assist them with their job functions". Described in this fashion, M.I.S. already exists in all police agencies. Yet, we believe that improved M.I.S. would enhance the performance of many Canadian police forces. By using more advanced information technology and associated procedures, Canadian police forces could improve the <u>efficiency</u> with which information is collected and stored, and the <u>effectiveness</u> with which it is used by police officers.

The study report has been divided into five separate volumes. Each is addressed to a subject matter which is fundamental to developing the notion of M.I.S. for Canadian police. Each volume is completely self-contained and can be read apart from the others.

Volume I is entitled <u>Technological Alternatives and</u> <u>Development Initiatives for Canadian Police</u>. It develops the notion of M.I.S. within the context of overall technological change and its impact on policing. It considers both the historical perspective and the future challenges of developing the new M.I.S. technology for policing.

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Volume II is entitled <u>Police Management Information</u> <u>Systems Developments in the United States: A Comparative</u> <u>Review. M.I.S. as an application of electronic innovation was</u> born and nurtured in the United States. In this volume we describe some of the more important experiences with M.I.S. in selected U.S. jurisdictions and distill a number of key "lessons" for our Canadian police audience.

Volume III is entitled <u>Police Management Information</u> <u>Systems: The Canadian Experience</u>. It outlines the experiences of a number of Canadian police forces with M.I.S. Also, it describes the results of a survey of large Canadian police forces and their interest in M.I.S. Finally, it concludes with a number of critical comments about the direction of M.I.S. development in Canadian policing.

Volume IV is entitled <u>Targeted Information Processing</u> <u>System (TIPS): A Development program for Police Management</u> <u>Information Systems</u>. Here, we provide a specific catalogue of procedures for developing M.I.S. in a police environment. We begin with a comprehensive description of the "way a police force should approach" the development of M.I.S. There are major changes in staffing and organization required. The Volume concludes with a "Master Plan" for developing M.I.S.

Volume V is entitled <u>Targeted Information Processing</u> <u>System (TIPS): General Design Specifications</u>. This final volume contains technical design specifications for TIPS which was generally described in Volume IV. Each TIPS component is described in terms of inputs, outputs and file interactions.

Although our Report leads the reader into detailed M.I.S. specifications, we emphasize that we do not develop the TIPS specifications as the ultimate comment on police M.I.S. TIPS is only one of many models of police M.I.S. Other approaches can be equally successful. The key notion in TIPS is that a police force should design its own information system to complement its own internal "demand" for information -or the kind of information that different police managers need to support their job functions. Few "packaged M.I.S. designs", including TIPS, will satisfy this need for all police forces.

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# STUDY OF POLICE MANAGEMENT INFORMATION SYSTEMS

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# SUMMARY AND CONCLUSIONS

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In the spring of 1976, Decision Dynamics Corporation was asked by the Ministry of the Solicitor General to conduct a study of police management information systems for Canadian municipal police forces.

This document provides a general description of the summary and conclusions of the overall study. It is brief. It is designed to describe the highlights of a report which took over one year to complete and whose final version extends over 800 pages. Its ultimate aim is to synthesize the volumes of material produced in the overall study.

## A. The Purpose of the Study

The purpose of the police management information systems study was described as: "develop management information systems specifications that could be used by Canadian police departments to guide future information systems development. Documents developed through the study could be used by police forces to identify first, their own information requirements and second, the general specifications of information systems required to meet these needs".

The overall aim of this study is to provide an "interpretive analysis" to assist Canadian police managers in the evaluation and application of new management information systems technology in their own jurisdictions.

It is difficult to define management information systems (M.I.S.), primarily because the term, and its application in police forces, includes such a broad range of issues and operating functions. Consider a basic definition of M.I.S., i.e.,

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It is the entire set of information handling procedures and instruments designed to collect, store, retrieve and deliver information to appropriate individuals in an operating organization. It satisfies the needs of <u>operations</u> (records and documentation), <u>operational manage-</u> <u>ment</u> (monitoring and control) and <u>planning</u> (forecasts to anticipate the future).

This definition suggests that every organization has an operating M.I.S. Without an M.I.S., an organization could not exist. Information, broadly defined, is the basic issue of management. As a result, when we consider the operation of an M.I.S., we must review all aspects of management in the organization and show how information intersects with decision-making. This is why the subject matter of M.I.S. is so broad.

Yet, traditionally M.I.S. is described in a much narrower domain. Since modern management information systems have become increasingly dependent on computers, many police administrators have begun to think of M.I.S. solely as an application of computer sicnece. This notion has confused the issue of M.I.S. Computers are necessary in modern information systems. As machines become less expensive, due to technological change, and labour becomes increasingly expensive, there will be strong economic pressures in policing to use machines for information storage and retrieval. However, our major point is that M.I.S. goes beyond the issue of computer hardware and software. Our understanding of M.I.S. suggests that the process of M.I.S. development in Canadian policing must consider the computer issue within a much broader context of: How should information be collected and retrieved <u>relative to its use for police operations and management</u>. We focus on information use in police forces. This is the proper starting point for effective and efficient police M.I.S. in Canada. It is the basis of much of the material in the five volumes of our study Report.

# B. The Five Volumes of This Report

The final report of the police management information systems study has been divided into five separate volumes. Each volume has a separate role to play in providing an interpretation of management information systems for police managers. Each volume is designed as a "standalone" component of information that can contribute to a better understanding of police M.I.S. The five volumes are:

- Volume I: <u>Technological Alternatives and Develop-</u> <u>ment Initiatives for Canadian Police</u>. We examine current trends in policing for Canadian municipal police jurisdictions and project their implications on the need for management information systems in the future.
- Volume II: <u>Police Management Information System</u>
  <u>Developments in the United States: A Comparative</u>
  <u>Review</u>. We review M.I.S. development in American
  police jurisdictions and extract a number of
  recommendations for similar developments in Canada.

- Volume III: <u>Police Management Information Systems</u>: <u>The Canadian Experience</u>. We describe M.I.S. developments in Canada. We report on a survey of large Canadian municipal police forces. Also, we describe the specific M.I.S. initiatives in a number of individual police forces. We conclude that Canadian police departments have only recently become interested in this technological area.
- Targeted Information Processing Systems - Volume IV: (TIPS): A Development Program for Police Management Information Systems. This volume contains a conceptual framework for developing a management information system in a Canadian police jurisdiction The major emphasis is on "why?" and "how?". We view this volume as a "catalogue of procedures" for developing M.I.S. in a police department. Although few of the procedures are "critical" in that they "must" be implemented for successful police M.I.S. development, we believe that an awareness of all of the elements specified in this volume (and the subsequent Volume V) will help police managers to develop M.I.S.
- Volume V: <u>Targeted Information Processing Systems</u> (TIPS): General Design Specifications. This final volume contains most of the technical design qualities of the management information system framework presented in the previous Volume IV. Each component is described by a general flowchart illustrating inputs, output reports and file interactions. In addition, each file is described in terms of the various record types and data elements contained therein.

The titles of two of the five volumes refer to the "Targeted Information Processing System (TIPS)". This is the name that we have adopted for the information system conceptualization developed in this study. The emphasis is on the term "targeted". We use this term to underscore the one crucial element of information system design which has been underestimated in many M.I.S. implementations: the information system must be designed to provide information to individuals who require This has an It must be targeted to user requirements. it. important development corollary in our TIPS specifications: we recommend that police forces considering M.I.S. devote a significant amount of their resources to an analysis of: "who needs what kind of information to satisfy what type of police job functions".

This leaves us with one inescapable conclusion. There is no single "packaged" police M.I.S. As we have already stated, every police force has some form of M.I.S. in place. Since all police forces are different, the type of M.I.S. they will require "to deliver information to users in specific job functions" will differ by police force. But, because information technology is changing so rapidly, as are the demands being placed on police themselves, there is a constant need to They should be upgrade police information procedures. made more effective (as a means of delivering information to the appropriate users) and efficient (through reducing the costs of specific bits of information). These notions of effectiveness and efficiency are central to the TIPS development program described in our Report.

# C. <u>Technology and the Future of Policing in Canada</u> (Volume I)

The first volume in the five volume series of reports on this study examines the question of management information systems in its broadest possible context. We treat M.I.S. as an example of new technology and consider the overall issues in the application of new technology to policing. In other words, M.I.S. represents the application of new, often capital-intensive techniques for handling information in police organizations. It is associated with computers and technological changes in the electronics industry. It will have a profound effect on the style, philosophy and human relations within a police department. In that respect, M.I.S. is not much different than new technology in communications. Again, technological advancements through the miniaturization and improvement in communications devices have promoted the use of new communications systems in police forces. They are capital-intensive. They can drastically alter the style, philosophy and organizational texture of a police force.

We trace the development of an organizational philosophy in policing and the impact of early forms of technological change. For example, the use of telephones had a major impact on the application of patrol techniques and the relationship between patrol officers and senior command. Also, we seek to interpret the social, economic and political conditions of municipal policing during the recent, post World War II period. We show that a host of new pressures have had an impact on policing during this interval. These pressures have to a large extent, mitigated against the application of some forms of new technology, such as M.I.S., in Canadian municipal police forces.

We isolate a set of new, and pervasive social and economic pressures which we believe will have a major impact on policing over the next two decades. These include: economic conditions, which will make personnel costs rise rapidly relative to the cost of technologically enriched capital; the rate of technological advancement itself, which will continue to improve the effectiveness of "machines"; and, what we have called "demonstration effects", wherein police personnel will be able to learn from other institutional sectors (e.g., the health and education sectors) and adapt their technology for their own use. We conclude that there will be significant pressures for new technological applications in policing over the next two decades.

Finally, we outline our impressions of the effect of these pressures and other demographic and social events on the future of policing over the next two decades. For example, the rate of urbanization is increasing, the structure of housing available for this new urban population is changing and the age profile of the population is going through historically unparalleled shifts. All of these influences will have a major impact

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on both the organization and application of new technology for policing in the future.

We conclude Volume I with a set of recommendations for municipal police managers on adjusting and preparing for the future. Although we recommend an open and inquisitive attitude towards the application of new technology in policing, we caution our readers to adopt a cautious, conservative and reasoned "managed" implementation of this new technology.

#### D. The United States Experience (Volume II)

In many respects, the United States has been the font of technological development in the world during the 20th century. During the post World War II period, there has been a focus on R&D in the United States which complements and supports technological development for policing. The combination of millions of dollars spent on the space program and on military purposes has had an obvious secondary value through adaptive application to policing. The two technological areas most influenced by these two different types of R&D are police communications and computer applications.

Also, since the Omnibus Crime Control Act was passed in the United States in 1968, the federal government has made substantial resources available for the improvement of the effectiveness and efficiency of American policing. A significant proportion of these resources has been diverted to technological enhancements. Accordingly, we believe that technological development, particularly in police M.I.S., in the United States should be of major interest to Canadian police. There is much to learn. American police sources are quite willing to share their experiences with Canadian police audiences.

One of the most significant institutions developed in the United States to assist all sectors of the criminal justice system is the Law Enforcement Assistance Administration. We review the work of this agency and describe its initiatives on behalf of American policing. We conclude that LEAA has made a major impact on the use of advanced technology by American police forces. Its influence has been felt through a number of contributions. First, LEAA provides development money to police departments interested in building "demonstration projects". Α good part of these resources have been devoted to the development of the management information systems. Second, LEAA is active in documenting and evaluating the new technology which has been developed through its funding. Third, the existence of LEAA support has helped innovating police departments "hedge their risk" on their initiatives. This is an important contribution. New technology is risky. It is essential to have a large, well-funded agency which can share some of the financial burden of the uncertainties associated with new technological development.

In Volume II, we carried out intensive field visits to five of the most advanced police forces and describbed their management information systems. These municipal police forces are located in: The City of Miami, Florida; Kansas City, Missouri; Dallas, Texas; Los Angeles, California; and, San Diego, California. Many millions of dollars have been spent developing the information systems in these five police forces. There is a wealth of information available to assist Canadian development programs in these areas.

From our analysis of the U.S. situation in the development of police management information systems, we have developed a set of basic conclusions which are relevant to Canadian police. They are:

- the existence of a large agency such as LEAA, which can stimulate, support and document management information system initiatives may well be an essential ingredient to the effective use of resources in this area.
- there is a great deal of documentation and other types of information available in the United States about M.I.S. implementation. It is of great value to Canadian police.
- American police are much more interested and willing to accept the risks of experimentation. Much of this is carried out in an open environment and is characterized by a great deal of information transfer. We were surprised at the degree to which both senior and junior police officers in the police forces we visited showed

candor in describing both their failures and successes. This type of environment is an essential ingredient to the effective use of resources in the development of management information systems.

finally, crime conditions in the United States are fundamentally different from those in Canada. Large urban centres are characterized by much more crime, particularly violent crime. The issue of officer safety is much more pronounced in the American environment. This has a profound influence on the development of M.I.S. Systems oriented towards computer aided dispatch, automatic vehicle locators, mobile digital terminals, etc., are of more intrinsic value in the United States. Canadian systems design activities should be aware of these differences.

To conclude, there is much to learn from the American experience. But, Canadian police should evaluate carefully the meaning of this experience. We should not accept U.S. designs without cautious and careful questionning of their philosophic basis.

# E. <u>The Canadian Police Experience with Management</u> Information Systems (Volume III)

The most significant police management information systems development in Canada is the Canadian Police Information Centre (C.P.I.C.). Managed by the RCMP, C.P.I.C. is a fundamental information resource

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available for use by all police forces in Canada. The resource is managed centrally, for a totally decentralized spectrum of users. In our study, we have characterized C.P.I.C. as a <u>utility</u>; its value depends on the degree to which it is used by the largest number of police departments for storing and retrieving information on wanted persons, vehicles, property and criminal name references.

A major reason for the success of C.P.I.C. is its universal acceptance by Canadian municipal police. This, in turn, results from two features of the C.P.I.C. development program, i.e.,

- its internal operating characteristics, providing a turnaround of information requests in two or three seconds in a relatively error free environment.
- the slow, cautious and participatory mode of development adopted by the RCMP in the C.P.I.C. design initiative. A large number of departments were consulted in the design of C.P.I.C. The system was not released for use before it was adequately tested and found to be relatively fail-safe. As a result, there was a strong sense of confidence by the users of the system.

In our analysis of the Canadian and U.S. police M.I.S. environment, we learned that C.P.I.C. provides the development of Canadian M.I.S. technology with an important asset. In the United States, there are a large number of C.P.I.C.-type systems. The lack of a single, well operated, national utility such as C.P.I.C. in the United States has burdened the M.I.S. development program of many individual municipal police forces. For example, the City of Miami Police Department information systems had to be designed to interface with six separate C.P.I.C.-type field support information systems, at a significant expense to the initial systems design.

We carried out a survey of large Canadian municipal police forces in order to provide a reference on the current state of police M.I.S. development in Canada. In this survey, we learned a number of basic things about Canadian municipal M.I.S. development, i.e.,

very few Canadian municipal police forces are investing sufficient development or operating funds on management information systems; this suggests that there is not yet a major resource commitment to this technology. In part, this has resulted because Canadian municipal police forces are so well served by C.P.I.C. for field support information. Also, Canadian police have not yet come to grips with the value of M.I.S. for police operations.

 on the other hand, our survey did reveal a growth of interest in M.I.S. by senior police managers. Many chiefs surveyed indicated that they were becoming more interested in considering the application of computers to their police forces. there is not yet a well defined consistent set of views among Canadian police managers on how and where M.I.S. should originate in their police force. In some police departments, there is a belief that M.I.S. should be the responsibility of the Research and Development Unit. But not all municipal police forces has such In other forces, Central Records or a unit. a Data Processing Unit are cited as the locus of the development initiative. Finally, in some police forces there is a loose relationship requirements for the development of M.I.S. Until police can specify clearly what they require in the form of M.I.S., such a loose relationship will not lead to articulate systems design.

In addition to a broad based survey of 27 municipal police departments in Canada, we carried out a more intensive descriptive analysis of M.I.S. development programs in six of the more advanced Canadian forces. We do not suggest that this is the exhaustive list of police forces in Canada involved in M.I.S. development. We selected these six forces only because their development programs help illustrate the key elements in the process. The forces which warranted elaborate descriptions in Volume III of our study include:

 the City of Ottawa Police Force, Ontario. We examined two implementations in this police force: the TOPCOPS occurrence reporting system and a system currently being implemented by the Ontarip Police Commission called CADRE.

- the City of Edmonton Police Force, Alberta.
  We focussed on the Police Headquarters Project which is currently underway to develop a "modernization master plan". It includes the design of an information system.
- the RCMP Detachment in Surrey, British Columbia. This RCMP Detachment, which is providing municipal police services in Surrey, is currently involved in a shift in managerial philosophy towards Management By Objectives. The new management system is associated with the development of a computer aided dispatch facility for Surrey and other detachments in the Lower Mainland area.
- the City of Vancouver, British Columbia.
  We traced the development of an information system concept from the original master plan, called Police Management Information System (PMIS) to the current sub-system being developed through the provincial Attorney General, called Police Index Enquiry System (PIES).
- the Metropolitan Toronto Police Department, Ontario. This police force has had an extensive information system development underway for several years.
- the Ontario Provincial Police, Ontario.
  In this provincial police force, we reviewed the information procedures designed to satisfy a new management development process.

Although our survey suggests that there is not yet a major resource commitment to management information systems among Canadian municipal police departments, our visits to selected departments suggest that there are exciting, innovative and potentially valuable programs taking place in the field. What is obvious, throughout the Canadian police scene, is that few senior police officers are totally aware of the development programs taking place in other jurisdictions. Information transfer is episodic. It is not formalized. There has been little attempt to publish documentary evidence about M.I.S. development programs. This study represents the first such attempt in Canada.

Furthermore, there is little formalized initiative for evaluating the cost-effectiveness of much of the technology being developed through M.I.S. For example, most police managers either accept or reject the value of mobile digital terminals, and their associated technology, on faith. Few police officers in Canada realize that American experience with MDT's is rather inconclusive. For example, Kansas City, Missouri, where crime rates and their implications for officer safety strongly suggest the need for such devices, was not at all satisfied with the pay-off from these instruments.

There is a great need for much more communication about information systems in Canada. The information should not only be transmitted in the form of printed and published materials. Canadian police must learn to talk with other Canadian police, within the formalized environment of conferences, and other forms of information transfer, to strike a better understanding of police management information systems in the Canadian environment.

# F. <u>Building a Police Management Information System</u>: TIPS Concept (Volumes IV and V)

Volume IV in our report on the police management information study is entitled: <u>Targeted Information</u> <u>Processing System (TIPS): A Development Program for</u> <u>Police Management Information Systems</u>. It represents our ultimate understanding of how a police department should develop its information systems.

A major emphasis in this volume is on the need to maintain the strong guidance of police management, and the needs of police organization throughout the information system design process. Hence, a large proportion of this volume is devoted to issues which are not traditionally associated with systems analysis, computers, data retrieval and other such elements of management information systems. We exercise our mandate to construct an "interpretive" study of police management information systems in this volume.

First, we emphasize the concept of information as a resource. It has value to police operations. An advanced and modern information system is much more than what is currently contained in most Central Records units in municipal police forces. Central Records contain <u>records</u>; they are stored in one spot in order to serve documentary purposes. Central Records is accessed when a police officer wishes to know something about a particular case or a particular person's involvement with a particular case. A modern information system not only improves access to a retrieval from Central Records, but enables police management to use statistical information to make more informed decisions. This is the essential quality of information systems.

To illustrate the importance of this distinction for information systems design, we have borrowed an allusion from economics; we describe the conditions of "information supply and demand". A focus on information supply would emphasize the way information is generated, stored and retrieved in a police force. Improvements in the information supply capacity in a police department, say through the application of computers, may simply improve the accessibility of information in the police force and enable more rapid retrieval of data. This is an important capacity for police department, but it is not the only consideration.

Information demand is the other side of the management information system coin. Every organization has a peculiar structure of demand for information. In police forces the demand for information is related to: the type of functions being performed (e.g., services such as patrol and traffic enforcement) and levels of command (e.g., authority or the "need to know" which is based on authority). From our general understanding of information systems design in police and other jurisdictions, we believe that often there is insufficient concern for information demand exhibited in the M.I.S. design. Through the development of the TIPS framework, we articulate a set of procedures which we believe redresses this balance.

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A large part of Volume IV considers the relationship between police organization and information systems. First, we define a general set of police <u>functions</u> and <u>command levels</u> around which we believe information can be targeted. Then, based on our field studies in the Hamilton-Wentworth Regional Police Force, the Quebec City Police Department and the City of Edmonton Police Force, we show how particular types of information can be targeted within this framework of a police organization.

Second, we provide a procedure which can be used by police forces to examine the internal need for information (demand) in their departments. The procedure is called: the Position/Activity Review. We believe that the use of this type of procedure would help police forces design information systems that complement the organizational demand for information.

Finally, in this volume we present a conceptual design for thw TIPS management information system and some directions for the required development program. Extensive estimates are made on the cost of building an M.I.S. such as TIPS and the time required to carry out the development program. To summarize: we have estimated that it would take approximately seven years for a police force to build an information system such as TIPS. The total seven year development cost would approximate \$1,720,000. This assumes that computer hardware is purchased by the police force. The operating cost would range from \$185,000 in the third year to approximately \$305,000 in the seventh year and beyond (in 1977 dollars).

The most important feature of the TIPS development plan framework is its recommendation for the type of development tasks required in the first two years. A good portion of these initial two years should be devoted to preliminary development steps such as: the development of a master plan, a feasibility study, a total review of policies, procedures and procedural documentation in the police department, and careful specification of user requirements for information.

These cautious and conservative recommendations for time allocations during the development of M.I.S. are based on a number of lessons which we learned during the field portion of this study. First, we believe that C.P.I.C. has been successful, in part because the designers of the system took the time required to develop, pretest, and evaluate a set of procedures which could satisfy all users. Second, in our field visits to U.S. jurisdictions, we developed the impression that those forces which placed a great emphasis on planning and preparation for M.I.S. tended to develop the most successful systems. Finally, in Canada the notion of M.I.S. is relatively new. This enhances the argument in favour of laborious preparatory work providing the background for M.I.S. developments.

The general descriptions of TIPS presented in Volume IV are supplemented with material contained in Volume V. The more detailed descriptions include flowcharts of the 19 TIPS components, descriptions of each file defined within the TIPS framework, and detailed descriptions of many of the more important data elements contained within the TIPS system.

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### SELECTED BIBLIOGRAPHY

# Bibliographical Sources

- Bernier, Robert and Rosette Gagnon. <u>Bibliographical Guide</u>: <u>The Economics of Crime and Planning of Resources</u> <u>in the Criminal Justice System</u>. Montreal: International Centre for Comparative Criminology, University of Montreal, April 1975.
- Jayewardene, C.H.S. <u>Recent Trends in Policing: A review</u> of the Recent Literature. Ottawa: Department of Criminology,, University of Ottawa. A Report to the Ministry of the Solicitor General of the Government of Ontario, 1974.
- Lynch, F. Jennifer. <u>Policing in Canada: A Bibliography</u>. Toronto: Centre of Criminology, University of Toronto, 1973.
- U.S. Department of Justice, Law Enforcement Assistance Administration. <u>A Compendium of Selected Criminal</u> Justice Projects. Washington, D.C.: June 1975.

. <u>1972 Directory of Automated Criminal Justice</u> Information Systems. Washington: 1972.

. <u>1976 Directory of Automated Criminal Justice</u> <u>Information Systems</u>. Volume 1 of 2. Washington: February 1976. U.S. Department of Justice, Law Enforcement Assistance Administration. <u>1976 Directory of Automated</u> <u>Criminal Justice Information Systems: Security</u> <u>and Privacy</u>. Volume 2 of 2. Washington: February 1976.

- U.S. Department of Justice, Law Enforcement Assistance Administration. National Criminal Justice Reference Service. Request for Bibliographies in the areas of: Computer Aided Operations, Police Budget and Cost Benefit Analysis, Police Manpower Deployment, Police Organization Assessment, Police Personnel Administration. 1976.
- Young, Suzanne. <u>Performance Measures for the Allocation of</u> <u>Police Patrol Forces: Annotated Bibliography</u>. Cambridge, Mass.: Operations Research Center, Massachusetts Institute of Technology, August 1974.

General

- Ackoff, R. Management Misinformation Systems. <u>Management</u> <u>Science</u>, Vol. XIV, No. 4, December 1967.
- Anochie, Gnoneze M. (ed.). <u>Computers, Local Government and</u> <u>Productivity, Volume II</u>. Papers from the 13th Annual Conference of the Urban and Regional Information Systems Association, August 24-28, 1975, Seattle, Washington.
- Attorney General, Province of British Columbia. <u>Police</u> <u>Index Enquiry System (PIES): Feasibility Study Report.</u> May 1976.
- Baran, Paul. Some Caveats on the Contribution of Technology to Law Enforcement. Santa Monica, Cal.: The Rand Corporation, April 1967.
- Bard, Morton et al. <u>The Function of the Police Crisis</u> <u>Intervention and Conflict Management: A Training</u> <u>Guide</u>, Washington: U.S. Department of Justice, Law Enforcement Assistance Administration, 1975.

Blumstein, Alfred and Richard Larson. Models of
 a Total Criminal Justice System. <u>Operations Research</u>,
 March-April 1969.

Boehm, G.A.W. Fighting Today's Crime with Yesterday's Technology. <u>Technology Review</u>, December 1968. pp. 51-60.

- Boydstun, John E. <u>San Diego Field Interrogation Final</u> Report. Washington, D.C.: Police Foundation, 1975.
- Boydstun, John E. and Michael E. Sherry. <u>San Diego</u> <u>Community Profile Final Report</u>. Washington, D.C.: Police Foundation 1975.
- British Home Office. <u>Report of the Committee on Police</u> <u>Extraneous Duties</u>. London: Her Majesty's Stationery Office, 1953.
- Calgary Police Service. <u>Calgary Police Service Police</u> <u>Information and Management System: Conceptualization</u> Report. October 15, 1975.
- Chase, Rosen and Wallace, Inc. <u>Use of Computers by Police</u>: A Cross-section of Police <u>Departments</u>. October 1970.
- Chicago Police Department, Operations Research Task Force. <u>Allocation of Resources in the Chicago Police</u> <u>Department</u>. Washington: U.S. Government Printing Office, March 1972.
- Chisum, Jerry W. <u>Multifaceted Expanded Crime Laboratory</u> <u>Services for the San Francisco Police Department</u> -<u>An Evaluation</u>. Report prepared for the San Francisco Police Department. Menlo Park, California: Stanford Research Institute, December 1971.
- Colton, Kent W. Computers and Police: Patterns of Success and Failure. <u>Sloan Management Review</u>, Volume XIV, No. 2, Winter 1972-73. pp.75-98.

- Colton, Jerry W. The Dedicated Police Computer Does it really make a difference? <u>The Bureaucrat</u>, Volume I, No. 4, Winter 1972. pp. 357-364.
- Cresswell, Ernest (ed.). <u>Proceedings of the Second Inter-</u> <u>national Symposium on Criminal Justice Information</u> <u>and Statistics Systems</u>. April 30 to May 2, 1974, San Francisco, California. Sacramento, California: Search Group Inc.
- Edmonton Police Department, Operations Analyses Section. <u>Phase I Analysis of 1975 Patrol Deployment</u> Practices. January 1976.
- Folk, Joseph F. <u>Municipal Detective Systems A Quantitative</u> <u>Approach</u>. Cambridge, Mass.: Operations Research Center, Massachusetts Institute of Technology, January 1971.
- Franklin, C.R. and T.J. Lutz. <u>Law Enforcement Alternatives</u>: <u>A Cost-Benefit Analysis</u>. Rochester, New York: Graduate School of Management, University of Rochester. May 1970.
- Gass, Saul I. and John M. Dawson. <u>An Evaluation of Policy-Related Research: Reviews and Critical Discussions of Policy-Related Research in the Field of Police Protection</u>. For the National Science Foundation. Bethesda, Maryland: Mathematics Inc., October 1974.
- Heller, Nelson B. <u>What Law Enforcement Can Gain from</u> <u>Computer Designed Work Schedules</u>. Washington: U.S. Government Printing Office, November 1974.

Heller, Nelson B. <u>Operations Research at the St. Louis</u> <u>Metro Police Department</u>. Paper presented at 39th Annual Meeting of Operations Research Society of America. May 5-7, 1971.

Institute for Public Program Analysis. <u>Work Schedules</u> -<u>A Catalogue of Computer Programs, Materials</u>, <u>Training and Technical Assistance for their design</u>. July 1976.

Jessup, John A. <u>An Overview of the Police and Community</u> <u>Services Project</u>. For the Management Co-ordinating Committee. December 1975, Revised February 1976.

> . The Development and Use of Social Accounts as a Means of Evaluating the Effectiveness of Community Services - A case Study of the Vancouver Police Department. Thesis to University of British Columbia, April 1975.

Larson, Richard C. Decision-Aiding Tools in Urban Public Safety Systems. <u>Sloan Management Review</u>, Winter 1972-73. pp.55-73.

> . <u>Resource Allocation in Public Safety Services</u>. Paper presented at the Symposium on Research Applied to National Needs (RANN), Washington, D.C. November 18-20, 1973.

. Resource Planning for Urban Public Safety Systems. <u>Technology Review</u>, Volume LXXVI, No. 7, June 1974. pp. 20-29.

- Leonard, V.A. <u>The Police Records System</u>. Springfield, Illinois: Charles C. Thomas, Publisher, 1970.
- Maltz, Michael D. <u>Evaluation of Crime Control Programs</u>. Washington, D.C.: U.S. Government Printing Office, 1972.
- Metropolitan Toronto Police Force, Methods and Operations Unit. Profile of Metro Police Force Computer Systems. July 1976.
- Munro, Jim L. Towards a Theory of Criminal Justice Administration: A General Systems Perspective. Penology, November/December 1971. pp. 621-631.
- Murphy, John J. Arrest by Police Computer: <u>The Contro-</u> <u>versy Over Bail and Extradition</u>. Lexington, Mass.: D.C. Heath and Co., 1975.
- National Advisory Commission on Criminal Justice Standards and Goals. <u>Report on Police</u>. (one of six volumes). Proceedings of the National Conference on Criminal Justice. Washington, D.C., 1973.
- National Clearinghouse for Criminal Justice. <u>Guidelines for</u> <u>the Planning and Design of Police Programs and</u> <u>Faciclities.</u> University of Illinois. LEAA, U.S. Department of Justice. 1973.
- North Richland Hills Police Department. <u>Rules for Law</u> <u>Enforcement Offices: A Manual on Police Discretion</u>. North Richland Hills, Texas. 1976.

Ontario Police Commission. <u>CADRE Computer Aided Dispatch</u> and Records Entry System Description. April 1976.

> . Police Budget Planning and Reporting Project Study Plan. circa. 1974.

Ottawa Police Force. <u>Description of Occurrence Reporting</u> <u>System and Occurrence Inquiry and Statistical</u> <u>Reporting System of the Ottawa Police Force</u>. n.d.

Peterson, Joseph L. <u>The Utilization of Criminalistics</u> <u>Services for the Police: An Analysis of the</u> <u>Physical Evidence Recovery Process</u>. MILECJ "Monograph". Washington: U.S. Government Printing Office, March 1974.

President's Commission on Law Enforcement and Administration of Justice. <u>Task Force Report: Crime and Its</u> <u>Impact - An Assessment</u>. Washington: U.S. Government Printing Office, 1967.

Project Search. <u>Design of A Standardized Crime Reporting</u> System. Technical Report No. 9, December 1976.

Repetto, T.A. Crime Control Management of the Police. <u>Sloan Management Review</u>, Volume XIV, No. 2, 1972-73. pp. 45-54

Riccio, L.J. <u>Simulation Model for New York City's Felony</u> <u>Adjudication System</u>. 1973 Winter Simulation Conference Paper.

- Rieder, Robert J. Law Enforcement Information Systems. Springfield, Illinois: Charles C. Thomas, Publisher, 1972.
- Robin, G.D. Justifiable Homicide by Police Officers. Journal of Criminal Law, Criminology and Political Science, Volume LIV, 1963. pp.225-231.
- Solicitor General of Canada, <u>The Police Function in our</u> <u>Changing Society</u>. Proceedings of Conference B-"The Selection and Training of the Policeman", Banff, Alberta, November 27-29, 1972.

. The Police Function in our Changing Society. Proceedings of Conference C - "Research and Communications" Montebello, Quebec, February 5-7, 1973.

. <u>The Police Role in the Correctional System</u>. Report prepared by the National Joint Committee of the Canadian Association of Chiefs of Police and the Federal Correctional Services. Ottawa. 1975.

Solicitor General of Canada. <u>Report of the Task Force on</u> Policing in Ontario. 1974

- Somerville, Scott, C. London Police Force Looking to the <u>Future: A Philosophy of Team Management</u>. A Local Government Management Project. February 1976.
- Statistics Canada. Law Enforcement Judicial and Correctional Statistics. Volume III, No. 1, May 1975. Ottawa: Information Canada.

- Statistics Canada. <u>Police Administration Statistics, 1972</u>. (Annual, 85-204) Ottawa: Information Canada.
- Steel, J.R. Accident Analysis by Computer. Police Research, No. 16, October 1970.

Task Force Report, <u>The Police</u>. Washington: U.S. Government Printing Office, 1967.

- U.S. Department of Commerce and the National Bureau of Standards. <u>Guidelines for Documentation of Computer</u> <u>Programs and Automated Data Systems</u>. Washington: U.S. Government Printing Office, February 15, 1976.
- U.S. Department of Justice, Federal Bureau of Investigation. <u>Uniform Crime Reporting Handbook: How to Prepare</u> Uniform Crime Reports. Washington: January 1974.
- U.S. Department of Justice, Law Enforcement Assistance Administration, National Criminal Justice Information and Statistics Service. <u>Guideline Manual</u>: <u>Comprehensive Data Systems Program</u>. Washington: April 1976.

. Expenditure and Employment Data for the Criminal Justice System, 1974. Washington, February 1976.

. Trends in Expenditure and Employment Data for the Criminal Justice System, 1971 to 1974. Washington, May 1974.

, National Law Enforcement Telecommunications

<u>Network Analysis - Final Report, Phase II.</u> Washington, February 1975.

- U.S. Department of Justice, Law Enforcement Assistance Administration. <u>Third Annual Report of the Law</u> <u>Enforcement Assistance Administration - Fiscal</u> Year 1971. Washington: U.S. Government Printing Office, 1971.
- Waller, et al. <u>Monitoring for Criminal Justice Planning</u> <u>Agencies</u>. Washington: U.S. Department of Justice, LEAA, NILECJ, March 1975.
- Wasson, David K. <u>Community-based Preventative Policing</u>: <u>A Review</u>. Report for the Solicitor General of Canada. Toronto: John D. Crawford and Co. Ltd., n.d.
- Weidman, Donald R. et al. <u>Intensive Evaluation for Criminal</u> <u>Justice Planning Agencies</u>. Washington: U.S. Government Printing Office, July 1975.
- Weinstein, Iram J. et al. <u>Requirements and Alternative</u> <u>Concepts for the Edmonton Police Department</u> <u>Headquarters Facilities and System. Volume I:</u> <u>Summary. Volume II: Working Papers. Menlo Park,</u> California: Stanford Research Institute, July 1977.
- Wexler, Mark N. <u>Police Culture: A Response to Ambiguous</u> <u>Employment</u>. Masters dissertation to the University of Western Ontario. London 1973.

White, et al. Police Burglary Prevention Programs. Washington:

U.S. Government Printing Office, September 1975. -

Wilson, James Q. <u>Varieties of Police Behaviour</u>. Cambridge, Mass.L Harvard University Press, 1968.

Wisehand, Paul M. and Tug T. Tamaru. <u>Automated Police</u> <u>Information Systems</u>. New York: John Wiley and Sons, Inc., 1970.

. . . . .

Budgeting

- Fisher, G.H. <u>The World of Program Budgeting</u>. Santa Monica, Cal.: The RAND Corporation. May 1966.
- Franklin, C.R. and T.J. Lutz. <u>Law Enforcement Alternatives</u>: <u>A Cost-Benefit Analysis</u>. Rochester: Graduate School of Management, University of Rochester. May 1970.
- Kapsch, Robert J. Life Cycle Costing Techniques Applicable to Law Enforcement Facilities. Washington: U.S. Government Printing Office. October 1974.
- Moke, H.W. <u>Effective Police Administration: A Behavioral</u> <u>Approach</u>. San Jose, Cal.: Justice Systems Development. 1975.
- National League of Cities, U.S. Conference of Mayors. <u>A Workbook on Standards and Goals: The Police</u>. January, 1975.
- Novick, David C. Long Range Planning through Program Budgeting. Santa Monica, Cal.: The RAND Corporation. May 1968.
- Shoup, Donald C. and Stephen L. Mehay. <u>Program Budgeting for</u> <u>Urban Police Services</u>. Los Angeles: Institute of Government and Public Affairs, University of California. 1971.

- Boyd, Gary E. <u>The Los Angeles Fire Department Command and</u> <u>Control System</u>. Santa Barbera, Cal.: Public Safety Systems, Inc. October 1971.
- Caroll, Arthur et al. <u>Computer Aided Dispatching for Law</u> <u>Enforcement Agencies</u>. Urbana, Ill.: Community Technology, Inc. n.d.
- Chelst, Kenneth. <u>An Interactive Approach to Police Sector</u> <u>Design</u>. Cambridge, Mass.: Operations Research Center, Massuchesetts Institute of Technology. March 1974.
- Ellis, Lee and Wilbert Reicher. <u>A Computer-assisted</u> <u>Dispatch System for Small Police Departments</u>. Champaign, Ill.: Community Technology, Inc. February 1975.
- Fey, R.L. <u>Automatic Vehicle Location Techniques for Law</u> <u>Enforcement Use</u>. Washington: Electromagnetics Division, National Bureau of Standards. September 1974...
- Jarvis, James P. and Richard C. Larson. <u>Optimal Server</u> <u>Assignment Policies in M/M/N/O Queuing Systems and</u> <u>Distinguishable Servers and Customer Classes.</u> Cambridge, Mass.: Operations Research Center, Massuchesetts Institute of Technology. April 1974.

Jarvis, Kames P. Optimal Dispatch Policies for Urban Server

<u>Systems</u>. Cambridge, Mass.: Operations Research Centeer, Massachusetts Institute of Technology. September 1973.

- Kelley, Thomas and John Ward. <u>Investigation of Digital Mobile</u> <u>Radio Communications</u>. Washington: U.S. Government Printing Office. October 1973.
- Larson, Richard C. A Hypercube Queuing Model for Facility Location and Redistricting in Urban Emergency Services. <u>Computers and Operations Research</u>. Vol. I, No. 1. March 1974. 67-95.

. Illustrative Police Sector Redesign in District 4 in Boston, Urban Analysis. Vol. 2, 1974. 51-91.

. Operational Study of the Police Response System. Cambridge, Mass.: Operations Research Center, Massachusetts Institute of Technology. December 1967.

- McDonnell, John J. et al. <u>Central Police Dispatch</u>. (NCJRS Exemplary Project) Washington: U.S. Government Printing Office. n.d.
- Shearing, C.D. <u>Dial-A-Cop: A Study of Police Mobilization</u>. (Preliminary Draft) Toronto: Centre of Criminology, University of Toronto. April 1973.
- Willemain, Thomas R. Approximate Analysis of a Hierarchical Queuing Network. <u>Operations Research</u>. Vol. XXII, No. 3, May-June 1974. 522-544.

Investigation

- Block, Peter B. and Donald R. Weidman. <u>Managing Criminal</u> <u>Investigations</u>. Washington: U.S. Government Printing Office. June 1975.
- Buck, George A. et al. <u>Police Crime Analysis Unit Handbook.</u> Washington: U.S. Government Printing Office. November 1973.
- Chaiken, Jan M. <u>The Criminal Investigation Process, Volume II:</u> <u>Survey of Municipal and County Police Departments</u>. Santa Monica, California: The RAND Corporation. October 1975.
- Crabtree, C.T. <u>Investigation Control and Management System</u>. Sunnyvale, California: The Sunnyvale Department of Public Safety. 1975.
- Folk, J.F. <u>Municipal Detective Systems: A Quantitative</u> <u>Approach</u>. Cambridge, Massachusetts: Operations Research Department, Massachusetts Institute of Technology. January 1971.
- Gray, Paul and William R. Heitzman. <u>A Detective Allocation</u> <u>Model</u>. (Working Paper) Santa Monica, California: The RAND Corporation. October 1975.
- Greenwood, P.W. and Joan Petersilia. <u>The Criminal Investigation</u> <u>Process, Volume I: Summary and Police Implications</u>. Santa Monica, California: The RAND Corporation. October 1975.

- Meyer, John C. The Reaction and Proactive Models of Information Search and Utilization by Police: Search for an Alternative. Journal of Police Science and Administration. Vol. I, No. 3. 1973. 311-318.
- Peterson, Joseph, <u>The Utilization of Criminalistics Services</u> by the Police. Washington, D.C.: U.S. Government Printing Office. March 1974.
- U.S. Department of Justice, Law Enforcement Assistance Administration. <u>Strategies for Combatting the</u> <u>Criminal Receiver of Stolen Goods</u>. An Anti-fencing Manual for Law Enforcement Agencies. Washington, D.C.: U.S. Government Printing Office. August 1976.

- Abraham, Stanley C. <u>Tying Performance to Goals: An</u> <u>Information System Concept for the California</u> <u>Highway Patrol</u>. Los Angeles: Graduate School of Management, University of California. December 1975.
- Block, Peter and David Specht. <u>Neighbourhood Team Policing</u>. Washington: U.S. Government Printing Office. December 1973.
- Chaiken, Jan M. <u>Computer Programs for Allocating Police</u> <u>Patrol Cars</u>. Santa Monica, California: The RAND Corporation. January 1975.
- Chaiken, Jan M. and P. Dormont. <u>Patrol Car Allocation Model</u>: <u>Executive Summary</u>. Santa Monica, California: the RAND Corporation. September 1975.

Patrol Car Allocation Model: User's Manual. Santa Monica: The RAND Corporation. September 1975.

- Chaiken, Jan M. <u>Patrol Milocation Methodology for Police</u> <u>Departments</u>. Santa Monica: The RAND Corporation. September 1975.
- Gray, Paul and William R. Heitzman. <u>A Detective Allocation</u> <u>Model</u>. Santa Monica, California: The RAND Corporation. October, 1975.

Hirsch, Gary B. and L. Riccio. Measuring and Improving the

Productivity of Police Patrol. Journal of Police Science and Administration. Vol. II, No. 2, 1974. 169-184.

- Kelling, George L. et al. <u>The Kansas City Preventive Patrol</u> <u>Experiment</u>. Technical Report and Summary Report. Washington, D.C.: The Police Foundation. October 1974.
- Lipsett, F.R. and J.G. Arnold. <u>Computer Simulation of Patrol</u> <u>Operations of a Semi-Rural Police Force</u>. Working Paper. n.d.

. <u>Analysis and Computer Simulation of Patrol</u> <u>Operations of Several Canadian Police Forces.</u> Paper presented at Joint National Meeting of the Operations Research Society of America and the Institute of Management Sciences, November 17-19, 1975, Las Vegas, Nevada.

- McEwen, J. Thomas, <u>A Mathematical Model for Prediction of</u> <u>Police Patrol Workload</u>. Paper presented at TIMS/ORSA meeting, May 1, 1968.
- Riccio, Lucius J. Direct Deterrence An Analysis of the Effectiveness of Police Patrol and Other Crime Prevention Technologies. <u>Journal of Criminal Justice</u>. Vol. II, No. 3, Fall 1974. 207-217.

Shanahan, Donald T. <u>Patrol Administration: Management by</u> Objectives. Boston, Mass.: Holbrook Press Inc. 1975.

- Sherman, Lawrence W. et al. <u>Team Policing: Seven Case</u> <u>Studies</u>. Washington: The Police Foundation, August 1973.
- Stevens, James W. South Carolina: Scheduling Plan Doubles Night Patrols. Target. Vol. IV, No. 11. November 1975.
- U.S. Department of Justice, Law Enforcement Assistance administration. <u>Only Ex-offenders Need Apply</u> - <u>The</u> <u>Ohio Parole Officer Aide Program</u>. Washington: U.S. Government Printing Office. April 1976.

. <u>Allocation of Resources in the Chicago Police</u> <u>Department</u>. Report of the Operations Research Task Force of the Chicago Police Department. Washington: U.S. Government Printing Office. March 1972.

- Ward, Ward and Feeley. <u>Police Robbery Control Manual</u>. Washington: U.S. Government Printing Office, April 1975.
- Wasson, David K. <u>Community Based Preventive Policing: A</u> Review.

### Personnel

- Block, Peter B. and Deborah Anderson. <u>Policewoman on</u> <u>Patrol: Final Report</u>. Washington, D.C.: The Police Foundation. May 1974.
- Boyd, J.E. Assessing a Policeman's Performance. <u>Canadian</u> Police Chief. Vol. LXIV, No. 1, January 1975.
- Cohen, Bernard. <u>The Police Internal Administration of</u> <u>Justice in New York City</u>. New York: The New York City RAND Corporation, November 1970.
- Commission on Peace Officer Standards and Training. Law Enforcement Personnel Records Management. State of California. September 1974.
- Cruse, Daniel and Jesse Rubin. <u>Determinants of Police Behavior</u>: <u>A Summary</u>. (Criminal Justice Monograph) Washington, D.C.: U.S. Government Printing Office. June 1973.
- Dunnette, Marvin D. and Stephan J. Motowidlo. <u>Police</u> <u>Selection and Career Assessment</u>. Washington, D.C.: U.S. Government Printing Office. November 1976.
- Eisenberg, Terry, Deborah Ann Kent and Charles Wall. <u>Police</u> <u>Personnel Practices in State and Local Government</u>. (IACP and Police Foundation in co-operation with Education Testing Service) Washington, D.C.: The Police Foundation. December 1973.

Fowle, Bonnie. Police: Job Satisfaction and Performance.

Toronto: Hickling-Johnson Ltd. July 1975.

- Hoover, Larry T. <u>Police Educational Characteristics and</u> <u>Curricula</u>. (NILECJ Monograph) Washington, D.C.: U.S. Government Printing Office. July, 1975
- Juris, Hervey and Peter Feuille, <u>The Impact of Police Unions</u>: <u>Summary Report</u>. Washington, D.C.: U.S. Government Printing Office. December 1973.
- Schwartz, Alfred et al. <u>Employing Civilians for Police Work.</u> Washington, D.C.: U.S. Government Printing Office. 1975
- Stahl, O.G. and R.A. Staufenberger (eds.). <u>Police Personnel</u> <u>Administration</u>. Washington, D.C.: Police Foundation. 1974

U.S. Department of Justice. <u>The Function of the Police</u> <u>in Crisis Intervention and Conflict Management:</u> <u>A Training Guide</u>. Washington, D.C.: U.S. Government Printing Office. 1975

### Productivity

- Chapman, Jeffry and Werner Z. Hirsch and Sidney Sonenblum. <u>A Police Service Production Function</u>. Los Angeles: Institute of Government and Public Affairs, University of California, 1973.
- Hirsch, Gary B. and Lucius J. Riccio. Measuring and Improving the Productivity of Police Patrol. <u>Journal of Police</u> Science and Administration. Vol. II, No. 2, 1974.
- Hoffman, Richard B. Production Factors in Policing Services. Decision Sciences. Vol. II, October 1971. 432-447.
- National Commission on Productivity and Work Quality. <u>Employee Incentives to Improve State and Local</u> <u>Government Productivity</u>. Washington, D.C.: U.S. Government Printing Office, March 1975.
- Police Foundation. Improving Police Productivity. <u>Nation's</u> Cities. March 1975. 18-32.
- Riccio, Lucius J. (ed.). <u>Proceedings of the Criminal Justice</u> <u>Symposium on Police Productivity</u>. Bethleham, Pennsylvania: Department of Industrial Engineering, Lehigh University, July 19, 1974.
- U.S. Department of Justice, Law Enforcement Assistance Administration, National Institute for Law Enforcement and Criminal Justice. <u>Allocation of Resources</u> <u>in the Chicago Police Department</u>. Washington: U.S. Government Printing Office. March 1972.

Wolfle, Joan L. and John F. Heaphy (eds.). <u>Readings on</u> <u>Productivity in Policing</u>. Washington: The Police Foundation. 1975.

. ...

. . .-

#### U.S. Systems

Bochelman, Melvin F. <u>Alert II - Progress Towards a</u> <u>Computerized Criminal Justice System</u>. Kansas City Missouri Police Department. November 1973.

. Computers and Mobile Terminals in the Law Enforcement Environment. <u>Communications News</u>. August 1972.

• <u>Computers in Law Enforcement Operations</u>. <u>Police</u> <u>Entrant Class</u>. Kansas City Missouri Police Department. Rev. November 1973.

- Cain, Robert and John R. Ours. <u>PROMIS for the Nonautomated</u> <u>or Semi-automated Office.</u> (Prosecutors Management Information System.) Washington: U.S. Government Printing Office. April 1976.
- Criminal Justice Institute. <u>The Today Method of Operating</u> a Law Enforcement Institute. Detroit: N.D.
- Dallas Police Department. <u>Introduction to Police Dispatching</u> (Basic Aid to a Beginning Dispatcher). n.d. 45 p.

. Law Enforcement System of the Dallas Police Department. n.d. 55p.

Dean, Burton V. et al. <u>A Preliminary Systems and Allocation</u> <u>Study of the Cleveland Police Department.</u> Cleveland: Operations Research Department, School of Management, Case Western Reserve University. February 1970.

- E Systems Inc. Functional Specifications: The Miami Police Department. August 11, 1975.
- Feder, Captain Louis. Cable Car City's Cable System. <u>Office of Criminal Justice Planning, Bulletin</u>. Vol. 6. No. 7. August-September 1974. 3-6.
- IBM <u>City of Dallas Computer Assisted Dispatching</u>. White Plains, New York: 1974.

. Online Booking: New Orleans Police Department. White Plains, New York: 1974.

- International Association of Chiefs of Police. <u>Geographic</u> <u>Base Files: Administrative Overview</u>. Gaithersberg, Maryland: IACP Technical Development Division. 1976.
- Kansas City Missouri Police Department. <u>The Alert II\_System</u> <u>Today</u>. January 1, 1976.
  - . Alert User Manual. June 1, 1973. 490 p.

. <u>Directed Patrol Implementation Plan</u>. September 1975.- 401 p.

. <u>KCPRAS: Computerized Police Resource Allocation</u> System. n.d.

. Staff Research Unit Manual. September 1975.

King, Donald F. <u>A Master Plan for Criminal Justice Information</u> <u>System for the State of California</u>. Sunnyvale, Cal.: Public Systems Inc. June 1974. Los Angeles County Sherriff's Department. <u>Management Staff</u> <u>Services Bureau Project Status Report</u>. December 1974.

Los Angeles Police Department. <u>Emergency Command Control</u> <u>Communications System: Computer Aided Dispatching/</u> <u>Mobile Digital Communications Integration Request</u> for Proposal. May 1976.

> . Emergency Command Control Communications System: Radio Master Plan Request for Proposal. May 1976.

. Automated Development of Available Manpower (ADAM): Users Manual. July 1, 1975. 109 p.

. The Los Angeles Police Department and Computers. n.d. 62 p.

Los Angeles Police Department/Systems Development Corporation. <u>Patric Development and Design Alternatives</u>. August 25, 1972.-

. Patric Design Requirements, Volume I: System Requirements. July 17, 1972.

. <u>Patric Design Requirements</u>, Volume II: Research Results. July 17, 1972.

. <u>Phase I Operating System Description</u>. December 31, 1965. 135 p.

MacDonald, Malcolm E. Base Line Data Collection. <u>Systems</u> <u>Support for the Criminal Justice Community, Volume VI.</u> Omaha: University of Nebraska, March 1973.

- McDonell, John J. <u>Central Police Dispatch (Central Operations</u> <u>for Police Services, Muskegon Michigan</u>). Washington: U.S. Government Printing Office, 1975.
- New Orleans Police Department, Data Systems Section. <u>MOTION</u> (<u>Metropolitan Orleans Total Information Online Network</u>) User's Manual. Revised January 1975.
- North Carolina Department of Justice, Police Information Network. <u>North Carolina Internal Records Keeping System</u> Guide. n.d.

. Police Network Goes to Work for St. Louis Justice Departments. <u>Data Communications User</u>. October 1975. 39-40.

- Project Search. <u>Design of a Standardized Crime Reporting</u> System. Technical Report No. 9. December 1976.
- Reilly, Norman B. <u>National-Law Enforcement Telecommunications</u> <u>Network Analysis: Final Report, Phase II</u>. Pasadena, Cal.: Jet Propulsion Laboratory, California Institute of Technology. February 20, 1975.
- Rodriquez, Armando. <u>Current Operational Information System</u> of the Dallas Police Department. Dallas Police Department. n.d.

SSDC. <u>Criminal Justice Information and Communications System</u> <u>Region V, Planning Report</u>. For the Association of Bay Area Governments. Fullerton, Cal.: n.d.

> • Project CABLE: Functional Specification and Implementation Plan. For the San Francisco Police Department. n.d. 164 p.

San Diego, City of. <u>Notice to Bidders - Request for Proposal</u> <u>Police Department Communications Improvement Program</u>. 1973.

> • Proposal to the San Diego Police Department for the Development and Implementation of the Patrol Management System. Revised January 7, 1976. 77 p.

- San Francisco Police Department, Planning and Research Bureau. <u>Police Computer Based Information and Operational</u> <u>Controller's System: Data Processing Center Program</u> <u>Budget Proposal</u>. December 1974. 26 p.
- Search Group, Inc. <u>The American Criminal History Record</u> -<u>Present Status and Future Requirements</u>. Technical Report No. 14. Sacramento, Cal.: September 1976.

Stanford Research Institute. <u>Miami Modern Police: First</u> Year Summary. Menlo Park, Cal.: April 1973.

U.S. Department of Justice, Law Enforcement Assistance Administration. <u>Comprehensive Data Systems Program</u> <u>Guideline Manual</u>. April 27, 1976. 63 p. U.S. Department of Commerce, Bureau of the Census, Geography Division. <u>GBF/DIME System - User Program Series</u> Program Description. Revised February 1, 1976.

> . <u>Coder's Manual:</u> <u>Clerical Procedures for the</u> <u>Creation of an Extension of a GBF/DIME System.</u> Revised February 1, 1976.

- Virginia, State of, Department of State Police. <u>Virginia</u> <u>Criminal Information Network Operating Manual</u>. Richmond, Virginia: 1973.
- Washington D.C. Police Department. <u>WALES: Washington Area</u> <u>Law Enforcement System Terminal User's Manual</u>. August 1974.
- Wise, H. Lake, <u>Legal Liaison Division of the Dallas Police</u> <u>Department.</u> (NCJRS Exemplary Project) Washington: U.S. Government Printing Office. March 1976.
- Zaharchuk, T. et al. <u>Urban Canada: The Challenge of 2001</u>. Report prepared for the Ministry of State for Urban Affairs. mimeo. 1975.

#### APPENDIX B

## Sources of Information for the Police Management Information Study

The Police Management Information Study took more than one and one-half years to complete. The final report, in five volumes, contains many hundreds of pages. It is a comprehensive effort, which touches all elements which we believe to be contained within the general subject areas of management information systems for Canadian police. Its subject matter ranges between: the history of policing, the spirit of new technology in policing, the process of MIS development and flow charts describing many characteristics of a police MIS. We believe that the five volumes of our report can be represented as a self-contained body of information on Canadian police MIS.

On what authority did we reach our conclusions on MIS ? As we have stated throughout the five volumes of this study, there does not exist a central body of research literature on police MIS which can act as an authoritative reference point to MIS studies. We hope that this study will be a starting point for such a reference in Canada. Therefore, our "authority" originates from the large number of field contacts we made during the course of this sudy, as well as a reading list of literature on police management and record systems -- many of the items on this list were contradictory, or at least characterized by a confusing language on MIS subjects.

Police managers who read this report may well want to read further to gain a better understanding of the technical

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and procedural issues of police MIS. As a result, we have included Appendix A to Volume I. It is designed to act as a general outline to the types of information sources which we used in our study. It is <u>not</u> a comprehensive bibliography. We describe our sources of information merely to provide a general guide to the variety of sources required for an understanding of police MIS. We group the various items in a simple manner; categories of information sources are designated in the order in which we sought information at the beginning of our study. We make no attempt to divide the items into consistent areas of MIS "subjects", because the literature is simply not structured in an appropriate fashion.

The published sources of information for our study are broken up into nine categories, i.e.,

- bibliographical sources
- general
- budgeting
- dispatch
- investigation
- patrol allocation
- personnel management
- productivity analyses
- U.S. information systems.

A large number of the items, especially those listed under "U.S. information systems", were solicited directly from police sources. They are not published and cannot be found in most libraries. On the other hand, we met with great success in soliciting this material and advocate the same approach by other Canadian interested in police MIS.

Next, we describe the various police and other law enforcement agencies we visited during the study, in Appendix C. Given the philosophy of our study, and the fact that we spent approximately 20 per cent of the project time on field visits, this "source of information" is the most important element of the study.

### APPENDIX C

## Field Visits

## Canadian Police Forces in the Following Jurisdictions:

- Calgary, Alberta
- Edmonton, Alberta
- Hamilton Wentworth Region, Ontario
- London, Ontario
- Metropolitan Toronto, Ontario
- Ontario Provincial Police
- Ottawa, Ontario
- Quebec City, Quebec
- Royal Canadian Mounted Police (Ottawa Headquarters)
- Surrey, British Columbia
- Vancouver, British Columbia

## Other Canadian Agencies Involved with Law Enforcement:

- Canadian Association of Chiefs of Police
- Department of the Attorney General, (Justice Information Services Group), British Columbia
- National Research Council
- Ontario Police Commission

# U.S. Police Forces in the Following Jurisdictions:

- Dallas, Texas
- Kansas City, Missouri
- Los Angeles, California
- North Parkland Hills, Texas

- San Diego, California
- San Francisco, California

Other U.S. Agencies Involved in Law Enforcement;

- Law Enforcement Assistance Administration (LEAA)
- Police Foundation