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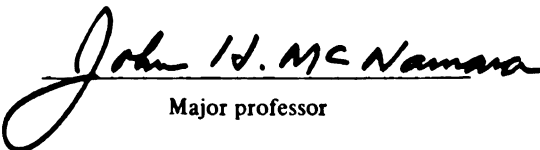
DEVELOPMENT AND DESIGN OF A POLICE
DISPATCH, COMMUNICATIONS AND
RECORDS SYSTEM

presented by

Larry A. Theisen

has been accepted towards fulfillment
of the requirements for

Master's degree in Science


Major professor

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DEVELOPMENT AND DESIGN OF A POLICE
DISPATCH, COMMUNICATION, AND
RECORDS SYSTEM

By

Larry A. Theisen

A THESIS

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ABSTRACT

DEVELOPMENT AND DESIGN OF A POLICE DISPATCH, COMMUNICATION, AND RECORDS SYSTEM

By

Larry A. Theisen

The Problem

The need for an integrated police dispatch communications and records system has been long standing a universal problem for law enforcement. Large, expensive, demanding main-frame computers have prevented the police from acquiring their own systems.

The Lansing Police Department (Lansing, Michigan) has developed a Police System to serve the needs of law enforcement at the county level. This system is comprised of a 911 Emergency Telephone System, Computer-Aided Dispatch System, Mobile Digital Radio System, and Computerized Records System.

The Approach

A chronological approach is presented that illustrates the development of each subsystem. Explanations presented demonstrate why the various system features were included in the design.

Data necessary for decision making in the design of the various systems is identified and uses explained. Problems associated with the development of the Police System are discussed and recommendations to avoid these situations are outlined.

Recommendations

A series of seven recommendations were developed that address the design of the Police System from conception to the point of implementation.

1. Hire experienced professional people to perform the following functions: research and planning, systems analysis, budgeting, purchasing, and technical advisors.

2. Conduct regular meetings between each participating jurisdiction's legislative body, system Governing Board member and a system planner. This eliminates confusion and the transfer of misinformation.

3. Employ a Director of the System at the onset of the project. This creates a position for authority, responsibility and decision making.

4. Design the system for implementation in one jurisdiction initially. This reduces the complication of multi-jurisdictional funding and services.

5. Conduct an independent feasibility study at the completion of the design stage and prior to implementation. This will avoid implementation of a system that will not function.

6. Provide sufficient funds for several on-site visitations to existing installations. On-site analysis and interviews provide a wealth of information not available in the literature.

7. Identify funding sources at the onset of the project and obtain a commitment to participate. This eliminates jurisdictions withdrawing their support midway through the system.

Implications

First, a model has been identified for the planning and design of such a system. The Police System itself is a model for law enforcement. The capabilities of the system and its ability to expand are unlike any other system in operation. No existing system has all of the capabilities of the Police System. This has been determined from vendor input, current literature on this type of technology and these types of systems and through consultation with the Office of Criminal Justice Programs. The features are a combination of the best from existing systems and include new ideas tailored to this region.

Transferability of this system to other jurisdictions presents an ideal situation. Flexibility is the key word, unlike previous law enforcement systems. The effects of the Police System will benefit the community, the users and management. Cost savings, increased efficiency and effectiveness are the expected results.

Dedicated to my father,
W.A. Theisen

ACKNOWLEDGEMENTS

I would like to express my appreciation to Dr. John McNamara whose guidance was an asset to the completion of this project.

In addition, I thank the Lansing Police Department for the opportunity to be associated with the development of the Police System and being allowed to utilize the data involved in the planning.

A special acknowledgement is given to Matthew F. Winger, who designed and coordinated the efforts involved in the planning of this system. Without his continued support and involvement, the Police System and this project would be incomplete.

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CHAPTER I

THE PROBLEM

The purpose of this study is the design and development of a police dispatch, communications and records system: at the county level. This system shall be referred to as the Police System. This system was designed by the staff of the Lansing Police Department, Lansing, Michigan, to initially serve the County of Ingham, with the capability to expand into a Tri-County operation. The Police System will be a computerized system interfaced with the following elements of the criminal justice information system:

- A. The State level Law Enforcement Information Network, the National Crime Information Center, and the Michigan Secretary of State, and;
- B. Criminal Justice Information Systems of the
 - (1) Courts, and;
 - (2) Prosecutors.

All of the above systems when interfaced with the Police System will provide a complete Criminal Justice Information System.

Development of the Police System will center around the design of each of the following subsystems:

- A. 911 Emergency Telephone System;
- B. Computerized Police Dispatching System;

- C. Mobile Digital Police Radio Communication System; and
- D. Computerized Police Records System.

The need for the Police System has been long standing and a universal problem for law enforcement. Large, expensive, demanding main-frame computers have generally prevented the police from acquiring their own systems. Police agencies are typically relegated to the use of a main-frame computer, owned by the City or County, on a shared-time basis with their programs having a low priority.

Within the project area of the Police System, only a few of the participating agencies have access to computers, and this is on a shared-time basis. Only the Lansing Police Department has technical personnel employed to develop computer programs for law enforcement needs. All of the agencies in the project area maintain manual paper files. Within these massive independent systems, there is little or no system for preventing, detecting or correcting errors. Also, there is a lack of standardization throughout the project area with regard to the types of data gathered and forms control.

Administrators requesting decision or policy making information have to wait while the data is manually gathered and analyzed. This type of data manipulation does not provide for timely distribution.

The implementation of the Police System will address and resolve all of the above problems. It will also address problems in the areas of communications, both telephone and radio, and automate a large portion of the dispatching functions. The Police System will

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be a system available directly to law enforcement and reducing the shared-time computer concept currently hindering law enforcement today.

The advent of mini-computers and micro processors has made it possible for police agencies to individually or collectively purchase and program a computer to meet their specific needs. This type of system can be located in-house at a reasonable cost, without making major demands on the environment and utilities of the site.

When police agencies collectively procure a system, many benefits can result. The most important benefit is that separate, yet interrelated and interdependent agencies can combine to form a strong, and coordinated union to carry out their criminal justice responsibilities. To date, nearly all law enforcement agencies within a given region operate independently with regard to standardized data collection, forms control, and the management of emergency services resources.

History of the Problem

The problems of uncoordinated and independent law enforcement efforts came to national attention in 1971 with the appointment of the National Advisory Commission on Criminal Justice Standards and Goals. The Commission immediately presented a list of objectives. Three of those objectives directly relate to the necessity of developing the Police System.

Immediately develop and apply all available police agency, community, other criminal justice element resources to apprehend criminal offenders.

Actively pursue criminal justice system coordination and effectiveness to serve society.

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Immediately develop and apply every available technological resource to stop crime and apprehend offenders.¹

In 1973, the Commission presented its recommendations to the President in the form of standards and goals to achieve the initial objectives the Commission had proposed for law enforcement. Within these standards were specific references to the development and implementation of the subsystems that will interface to form the Police System (page 12).

Efforts to achieve the standards and goals proposed by the Commission began in 1973 at both the State and Local (Ingham County) levels in Michigan. The Michigan Advisory Commission on Criminal Justice was appointed at the State level. At the local level in Ingham County, political and law enforcement leaders formed a Technical Committee to plan for the future implementation of a multi-jurisdictional 911 Emergency Dialing System. This was the initial step toward the development of the Police System that will consolidate, coordinate and standardize the delivery of emergency services within a county, based upon the centralized uniform collection of data.

Early on, at the local level, decisions were made about the development of a 911 system. It was not known at the time of these decisions that the result would be the Police System. It became apparent in 1974 that a 911 Emergency Telephone System would require the centralization of dispatching for all emergency services within the county. The 911 Technical Committee assisted by personnel from

¹The National Advisory Commission on Criminal Justice Standards and Goals, Police, U.S. Government Printing Office, 1973, p. 3.

Michigan Bell Telephone then began to develop a research program for the planning of the 911 Emergency Telephone System (Exhibit A, page 6).

Planning began as outlined in the "911 Checklist for Action" (Exhibit A). In late 1974, a 911 Implementation Committee was appointed by the City Council in Lansing (Michigan). Meetings, planning and general decision making continued on through 1975 and into February of 1976. At that point in time (February 2, 1976) a serious concerted effort was undertaken to plan for implementation of the 911 Emergency Telephone System. This effort began with a resolution of the Lansing City Council (page 9).

The resolution contained several important decrees including a planned implementation date for the 911 Emergency Telephone System of July 1, 1977. It should be noted that the resolution charged the Lansing Police Department with the responsibilities of working with: Michigan Bell Telephone Company, providing and preparing a centralized communications center, training personnel and operating the center, and budgeting the necessary funds. The 911 Implementation Committee was dissolved at this time and a 911 Governing Board composed of representatives from the participating agencies was established.

Until the time of the 1976 resolution, the general planning and decision making had been under the control of the governmental officials with the police agencies represented. The planning had centered around only the development and implementation of the 911

The following checklist is provided as a guide to the activities which are usually necessary in order to develop and implement a 911 system:

Phase I. Planning Decisions

1. Formation of a planning task force (see also Phase II, Item 1)
 - Chief of Police, Sheriff, other law enforcement
 - Fire Chiefs
 - Mayor or other elected official
 - Representatives from other emergency service agencies
 - Telephone company representative
 - Civil defense representative
 - Representative of citizens' groups
 - Others as desired
2. Review of existing information on 911.
 - Written materials
 - Contacts with communities already having 911
 - Information provided by local telephone company
3. Decision about area to be served.
 - Multijurisdictional
 - Central office boundary considerations
4. Inventory of emergency services in 911 area.
 - Fire departments
 - Police agencies--local, county, state, and federal
 - Ambulance services
 - Hospitals
 - Poison control centers
 - Suicide prevention centers
 - Drug abuse centers
 - Civil defense agencies
 - Weather warning stations
 - Public works department
 - Others
5. Selection of agencies to be included.
 - Identification of primary responsibilities
 - Identification of secondary responsibilities and qualifications

Exhibit A.--A Checklist for Action. (Source: 911 A Handbook for Community Planning, 1973.)

6. Location of answering center.
 - Police headquarters
 - Fire station
 - Separate communications center
 - Other
7. Answering center design decision.
 - Centralized reception/decentralized dispatch (relay)
 - Centralized reception/decentralized dispatch (transfer)
 - Centralized reception/centralized dispatch
 - Combinations of above
8. Equipment specifications.
 - Called party hold
 - Ring back
 - Central office identification
 - Others
9. Receive detailed cost quotation for 911 telephone service from serving telephone company(ies).

Phase II. Planning Activities

1. Negotiations with neighboring jurisdictions, if multi-jurisdictional system.
 - Inclusion of representatives on planning team
 - Arrangements for sharing responsibility for operating answering center
 - Cost-sharing arrangements
2. Assignment of responsibilities and drawing up of cooperation agreements with participating agencies.
3. Establishment of procedures for handling 911 calls.
 - Procedures for each kind of emergency
 - Procedures for nonemergency calls
 - Procedures for nuisance or false alarm calls
4. Determine who is to pay telephone bill and place order with the telephone companies.

Phase III. Implementation Activities

1. Telephone equipment modifications.
 - Central office modifications
 - Installation of special equipment in answering center

2. Training of 911 operators.
 - Techniques for dealing with distressed callers
 - Procedures for each kind of call
 - Familiarity with emergency resources
 - First Aid
 - Practice under simulated conditions
3. Publicity campaign, planning and implementation.
 - Television, radio, newspapers
 - Printed materials
 - Telephone stickers
 - Signs or decals painted on public safety vehicles
 - Presentations to school and citizens group
 - Other publicity activities

Phase IV. Implementation of 911

1. Acceptance of 911 calls on priority basis
2. Discouraging nonemergency use of 911
3. Record-keeping activities
4. Continuation of 911 publicity.

By Councilman Terry J. McKane

2-23-76

Resolved by the City Council of the City of Lansing

WHEREAS, the Lansing City Council established a "Lansing 911 Implementation Committee" on December 23, 1974 composed of Mayor Gerald Graves, Councilman Terry J. McKane, Police Chief Thomas O'Toole, Fire Chief Carl Barratt, Director of Emergency Operations James Holcomb and two Ingham County Commissioners; and,

WHEREAS, this Committee and staff personnel from several governmental entities have over the past year explored the most expeditious and efficient manner by which 911 service can be provided throughout the Tri-County area; and,

WHEREAS, an attempt was made to establish a "first phase" 911 System within an area encompassing the Townships of Watertown, DeWitt, Bath, Delta, Windsor, Delhi, Alaiedon, Meridian and Lansing and the Cities of Lansing, East Lansing and DeWitt; and,

WHEREAS, the governing bodies of the County of Ingham, the City of East Lansing and the Township of Lansing have informed the Chairman of the Implementation Committee, Councilman Terry J. McKane, that they desire to participate in the establishment of a 911 System; and,

WHEREAS, the Townships and Cities enumerated above, with the exception of East Lansing and Lansing Township, have formally or informally declared that they do not desire to enter into a contract with the City of Lansing for 911 answering and dispatch services; and,

WHEREAS, the Sheriffs of Ingham, Eaton and Clinton Counties, the MSU Safety Director and the Michigan State Police were also solicited as to their interest in participating in or assisting in the development of a 911 System; and,

WHEREAS, the Sheriffs of Eaton and Clinton Counties have indicated that they do not desire to participate directly in the 911 System but support the concept; and,

WHEREAS, the Sheriff of Ingham County and the Ingham County Board of Commissioners support the 911 concept and agree to implement the 911 System throughout Ingham County, by contract; and,

WHEREAS, the "911" emergency telephone service will give the public access to an emergency answering center which will permit the

EXHIBIT B.--Lansing City Council Resolution.

expeditious provision of all emergency services to include, but not specifically limited to police, fire and ambulance dispatch; and,

WHEREAS, the City Council of the City of Lansing is desirous of expeditiously providing a 3-digit emergency telephone number for the City of Lansing;

NOW, THEREFORE, BE IT RESOLVED, that the City Council intends to proceed with the establishment of a 911 answering and dispatch center which will possess the capability of providing answering and dispatching service for the City of Lansing, the City of East Lansing, Lansing Township and the County of Ingham; and,

BE IT FURTHER RESOLVED that the City Council directs the Chief of Police and the Fire Chief to establish a 911 answering and dispatch center with the capability for expansion to permit the provision of 911 answering and dispatch services to the City of East Lansing, Lansing Township and Ingham County, and subsequently the entire Tri-County region should they option, at some future time, to contract for 911 answering and dispatch services; and,

BE IT FURTHER RESOLVED that the Mayor is directed to sign the appropriate contractual documents with the City of East Lansing, Lansing Township and the County of Ingham; and,

BE IT FURTHER RESOLVED that the Chief of the Lansing Police Department is directed to:

- A. Take the administrative action necessary to commence the alterations to the 5th Floor Communication Center and the procurement and installation of all equipment required;
- B. Plan to have a fully operational 911 answering and dispatch center by July 1, 1977;
- C. Make the necessary arrangements with Michigan Bell Telephone Company.
- D. Budget the necessary funds to cover the service charges which are estimated to be \$14,000 per year for the City of Lansing; and,

BE IT FURTHER RESOLVED that the initial Governing Board for the 911 System will consist of the following officials: Chief, Lansing Police Department; Chief, Lansing Fire Department; Chief, East Lansing Police Department; Chief, East Lansing Fire Department;

the Public Safety Director, Lansing Township; the Ingham County Sheriff and a representative from the Tri-County Emergency Medical Services Council; and,

BE IT FURTHER RESOLVED that By-laws and an operating procedure manual will be developed by the members of this board and submitted to the respective legislative bodies of the voting members. These By-laws and operating procedures will be written and adopted by the Board within ninety days of its first meeting; and,

BE IT FURTHER RESOLVED that the Board shall submit an annual report every January to each of its respective jurisdictions as to its operations, problems and other relevant information; and,

BE IT FURTHER RESOLVED that ex-officio membership to this board will be offered the MSU Director of Safety, the Michigan State Police and the Tri-County Planning Commission; and,

BE IT FURTHER RESOLVED that the Governing Board may add such additional voting or non-voting members as they may subsequently determine; and,

BE IT FURTHER RESOLVED that the Implementation Committee established by City Council Resolution of December 23, 1974 is hereby dissolved and its functions and/or duties will be assumed by the 911 Governing Board and the Departments of Lansing City Government as appropriate, and,

BE IT FURTHER RESOLVED that it is the Council's understanding that the basic equipment and installation costs are estimated to be \$46,548 and that this amount will be paid for from a grant to be provided by the Tri-County Emergency Medical Services and should the final cost be more than this estimate, that the participating entities will share such costs by a cost-sharing formula as the Board may determine and that the equipment and installation costs that arise from governmental entities that subsequently contract for 911 answering and dispatch services will be paid for by these governmental entities; and,

BE IT FURTHER RESOLVED that the City Council and the Mayor of Lansing wish to express their thanks to the members of the Implementation Committee and all personnel who participated in the planning for the development of the 911 system.

Emergency Telephone System. The adoption of the resolution began a critical change in the direction of the research and planning.

First, the police were now the primary actors in the planning, responsible to the 911 Governing Board which was also composed primarily of police officials. This removed the politicians from the mainstream of planning.

Second, the Michigan Advisory Commission on Criminal Justice had presented its goals and standards for the State, which were consistent with the standards and goals of the National Advisory Commission on Criminal Justice with regard to records, communications, and centralization of Police Operations.

Last, the 1977 Michigan Comprehensive Law Enforcement and Criminal Justice Plan provided for federal funding of the following projects:

911 Emergency Telephone Systems,
Computer Aided Dispatching, and
Mobile Digital Radio Systems.

However, to be considered for funding in these projects certain criteria had to be met.

O.C.J.P. will not fund 911 projects unless the applicant has or is implementing a central dispatch or computer-aided dispatch.

All law enforcement agencies within a county of less than 500,000 population will participate in the central dispatch.

A centralized dispatch system and a 911 system must exist prior to the installation of a computer-aided dispatch or must be developed simultaneously.²

²Office of Criminal Justice Programs, 1977 Michigan Comprehensive Law Enforcement and Criminal Justice Plan, Lansing, Michigan, 1976, pp. 22-23.

Thus the groundwork was established, through mandates to obtain federal funds, for the development of more than just a 911 Emergency Telephone System. It was, at this point, that the idea of a Police System at the County level became a serious consideration. Through the efforts of the Lansing Police Department staff this planning is nearly complete and the Police System is approaching implementation.

Overview of the Police System Design

The design of the Police System is based upon the successful operation of its component subsystems. Each of the subsystems has its own particular set of objectives. These objectives are as follows:

- A. 911 Emergency Telephone System.
 - 1. Queuing delays will be reduced.
 - 2. Response time as measured from the time of detection of an incident to the time of agency notification will be reduced.
 - 3. Data collection will be improved through training that will standardize the data collected; and the use of the automated system to collect, verify and transfer the information.
- B. Computer Aided Dispatching.
 - 1. Response time as measured by the time of detection of an incident to the arrival of a police unit will be reduced.
 - 2. Data collection, storage and accuracy will increase and improve over the existing system.

3. Duplication of personnel equipment and facilities will be reduced.

C. Radio Frequency Communications--Digital.

1. Frequency congestion will be reduced.
2. Dispatcher workloads "busy time" will be reduced.
3. The speed and accuracy of data collection will increase.
4. Clerical time spent by center personnel will be reduced.

D. Records--Computerized.

1. Management functions aided by automated record keeping and report generation will provide administrators with timely, accurate information (not currently available) to better allocate the total resources of the organizations.
2. Clerical time spent by personnel will be reduced.
3. Data collection, storage and retrieval methods will improve.
4. Data analysis capabilities will be improved.

The key to the success of the Police System is the subsystems that are integrated to form the total system. These subsystems include a series of information processing systems that revolve around a county-wide 911 Emergency Telephone System, in conjunction with a Computer-Aided Dispatching System and a Mobile Digital Radio Communications System. Input from these three systems will form the base for a Computerized Records System.

Research into the development of the above named systems began with a review of pertinent research literature which is discussed in Chapter II. The implementation site is an important consideration in the development of the Police System, particularly when considering the transferability of such a system. In Chapter III the discussion will review the reasoning for the implementation site selected. In Chapter IV the development of the data base utilized in planning the Police System is presented. Chapter V begins the actual development of the subsystems with the design of the 911 Emergency Telephone System. This system provides the initial input of data for the design of the following systems: Chapter VI--The Computer-Aided Dispatching System; Chapter VII--The Mobile Digital Radio System; and, Chapter VIII--The Computerized Records System.

In Chapter IX all of the subsystems will be drawn together and the Police System will be the result. Chapter X will be utilized to discuss the impact of the Police System on the other elements of the Criminal Justice System.

In the final Chapter, Chapter XI, conclusions and recommendations about the planning and the system itself will be discussed.

CHAPTER II

REVIEW OF THE LITERATURE

The quantity of documentation published in this area of research is voluminous. To provide the most pertinent information available, the literature involved will be reviewed in the following three sections:

1. General Literature, which lead to the development of components of the Police System.
2. Planning documents.
3. Review of documentation from successful systems.

Within the review of systems section, a system may incorporate one or more elements of the Police System and thus provide a user history of the more successful aspects. This will cause the elements of the Police System to be reviewed as parts of existing systems and not as individual elements (i.e., 911, Computer-Aided Dispatch, etc.).

General Literature

There are two national level reports that began the initial exploration of improving the various information systems utilized by police. The first is The Challenge of Crime in a Free Society.¹ This

¹The President's Commission on Law Enforcement and Administration of Justice, The Challenge of Crime in a Free Society, Washington: Government Printing Office, 1967, p. 40.

text sets forth the recommendations of the President's Commission on Law Enforcement and Administration of Justice.

The Commission made the following recommendations

... an experimental program to develop computer-aided command and control systems... The telephone company should develop a single police number for each metropolitan area and eventually for the entire United States.²

A second report, research performed for the President's Commission, is Task Force Report: Science and Technology.³ This report provides the data gathered to assist in the recommendations developed by the Commission. Recommendations included research and testing in the following areas:

Procedures for improving police responsiveness to calls at a minimum cost.

An approach which could significantly reduce police radio frequency congestion.

Statistical approaches concerned with the improvement of allocation of patrol officers in the field.⁴

Both of the reports discussed were published in the late sixties and the areas of research identified were concepts. Police, prepared by the National Advisory Commission on Criminal Justice Standards and Goals,⁵ was the first report of national prominence that outlined specific standards for law enforcement: standards that set forth the development of the elements composing the Police System.

²Ibid., p. 41.

³The Institute for Defense Analysis, Task Force Report: Science and Technology, Washington: Government Printing Office, 1967.

⁴Ibid., p. 6.

⁵National Advisory Commission on Criminal Justice Standards and Goals, Police, Washington: Government Printing Office, 1973.

Through these standards the following components of the Police System were identified:

1. a single universal telephone number;
2. upgrade existing radio systems to provide for an efficient command and control operation;
3. reduce frequency congestion through the use of digital communications equipment;
4. standardize and automate data collection methods, data collection and records systems; and,
5. the consolidation of police services.

Thus the standards presented in Police outlined at the national level the direction of law enforcement for the next several years.

The national standards and goals were supported in Michigan through the document Criminal Justice Goals and Standards for the State of Michigan.⁶ Michigan improved on the national standards by providing more specific direction within their standards as follows.

A 24-hour 911 emergency telephone system (ETS) should be implemented state-wide by 1980...⁷

The State of Michigan should immediately stimulate research and development in the design, manufacture and operation of a pilot digital communications system...⁸

The State should implement a state-wide police management information system to assist police management...⁹

⁶Michigan Advisory Commission on Criminal Justice, Criminal Justice Goals and Standards for the State of Michigan, Michigan, 1974.

⁷Ibid., p. 73.

⁸Ibid., p. 75.

⁹Ibid., p. 204.

The literature discussed thus far, set in motion both law enforcement and private industry to develop viable systems consistent with published standards and goals. The most critical piece of literature in the development of the Police System was the 1976 Michigan Comprehensive Law Enforcement and Criminal Justice Plan.¹⁰ It was this document that provided money through federal grant awards for the development of the systems that comprise the Police System: 911 Emergency Telephone System, Computer-Aided Dispatching, Mobile Digital Communications Equipment, and the Law Enforcement Management System. The Comprehensive Plan further outlined the consolidation of police services. Thus, the Michigan Comprehensive Plan began the formation of the Police System by giving direction toward consolidation and mandating the combination of certain systems prior to the awarding of funds. With this direction in mind, the search for documents that outline the planning process was undertaken.

Planning Documents

Following the 1967 recommendations of the President's Commission on Law Enforcement and Administration of Justice, various types of new systems began to occur. Emergency Telephone Systems utilizing 911 were implemented which required consolidation of emergency services and cooperation of multiple jurisdictions. A "snowball" effect was beginning the formation of the Police System.

In June of 1972 the Federal Communications Commission sponsored a conference on the Emergency Telephone Number. The following

¹⁰Office of Criminal Justice Programs, 1976 Michigan Comprehensive Law Enforcement and Criminal Justice Plan, Lansing, Michigan.

recommendations were presented with regard to planning and implementation of a 911 Emergency Telephone System.

1. Plan to expand your communications center to serve the people who are trying to get through now, but cannot.
2. Plan to expand your work force. About 45 percent of NYPD calls came in between 4 p.m. and midnight, so be ready to pay premium wages.
3. Get the best equipment available, such as automatic call distributors.
4. Plan to build up your field force to take care of the additional calls that the system will be handling.
5. Do not open the center in July. Open in January, the slowest month of the year.¹¹

The publication, 911, A Handbook for Community Planning,¹² issued by the Office of Telecommunications Policy, Executive Office of the President, provided a valuable outline (Exhibit A, pages 6-8) to establish a work program in the development and implementation of a 911 system. Following this general outline and tailoring surveys to serve local needs provided the basic information necessary to begin the design of all elements in the Police System.

Central Police Dispatch: An Exemplary Project¹³ provided user history of a consolidated police dispatch center utilizing a 911 Emergency Telephone System (ETS) in Muskegon County, Michigan. Four major benefits were derived from the multijurisdictional consolidated dispatch:

¹¹Federal Communications Commission, Report of Conference on Universal Emergency Telephone Number 911, Washington, D.C., 1972, p. 7.

¹²Office of Telecommunications, Executive Office of the President, 911, A Handbook for Community Planning, Washington: Government Printing Office, 1973.

¹³Office of Technology Transfer, National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, U.S. Department of Justice, Central Police Dispatch: An Exemplary Project, Washington, D.C., U.S. Government Printing Office, 1974.

1. organizational,
2. operational,
3. technical, and
4. financial.

The contents of this publication outlined the project from conception through evaluation. Examples illustrated how the system functioned (Exhibit C, page 22), how the center was arranged (Exhibit D, page 23), and the type of legal agreements that were established. Also, included were samples of the data collected and analyzed in order to monitor and evaluate the system.

Staffing and training of the center was addressed--an issue not before discussed in earlier publications. The Muskegon County Central Police Dispatch (C.P.D.) utilized civilian personnel and determined that it "...resulted in substantial cost savings..."¹⁴

Performance of the system was evaluated against the National Standards.

C.P.D. comes very close to satisfying most of the applicable standards whose implementation was called for by 1975, and many of the other standards some of which are not called for until the 1980's.¹⁵

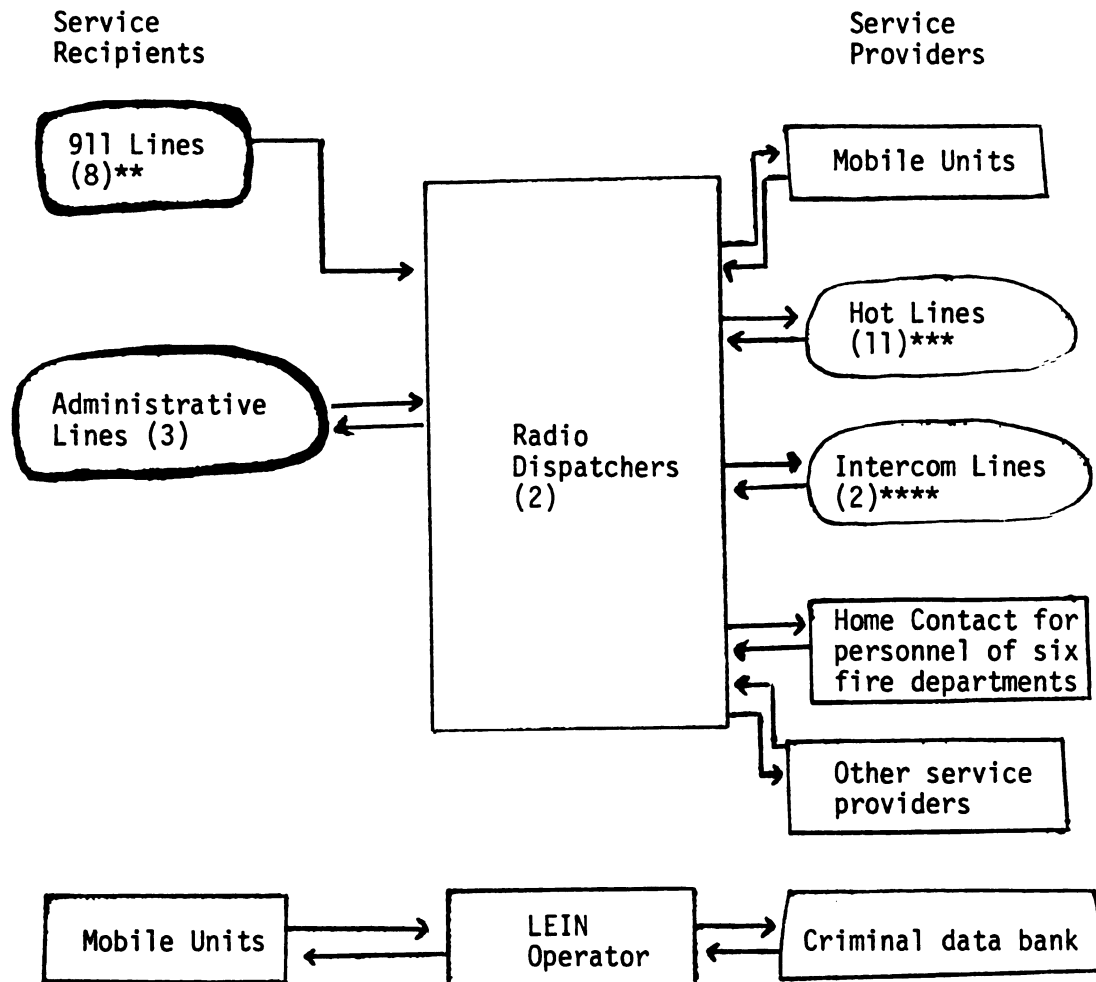
Thus this text was valuable in that it addressed a consolidated multi-jurisdictional 911 E.T.S. and was based in part on user history.

A group of three (3) articles was presented in the periodical Law Enforcement Communications (December, 1975).¹⁶ Two of these

¹⁴Ibid., p. 24.

¹⁵Ibid., p. 42.

¹⁶"Three Cities Heed the Call," Law Enforcement Communications, December, 1975, pp. 8-11.



*Telephone linkages are indicated by ovals, and radio linkages are indicated by rectangles.

** 911 lines are emergency telephone lines.

*** There are hot lines to three police departments (Muskegon Heights, Norton Shores, Muskegon Township); three fire departments (Muskegon City, Muskegon Heights, Norton Shores); and other service providers (two ambulance services, wrecker answering services, gas company and youth services).

**** There are intercom lines to the County Sheriff and the Muskegon City Police Department.

EXHIBIT C.--Central Police Dispatch Communications Network. (Excerpt from Central Police Dispatch: An Exemplary Project.)

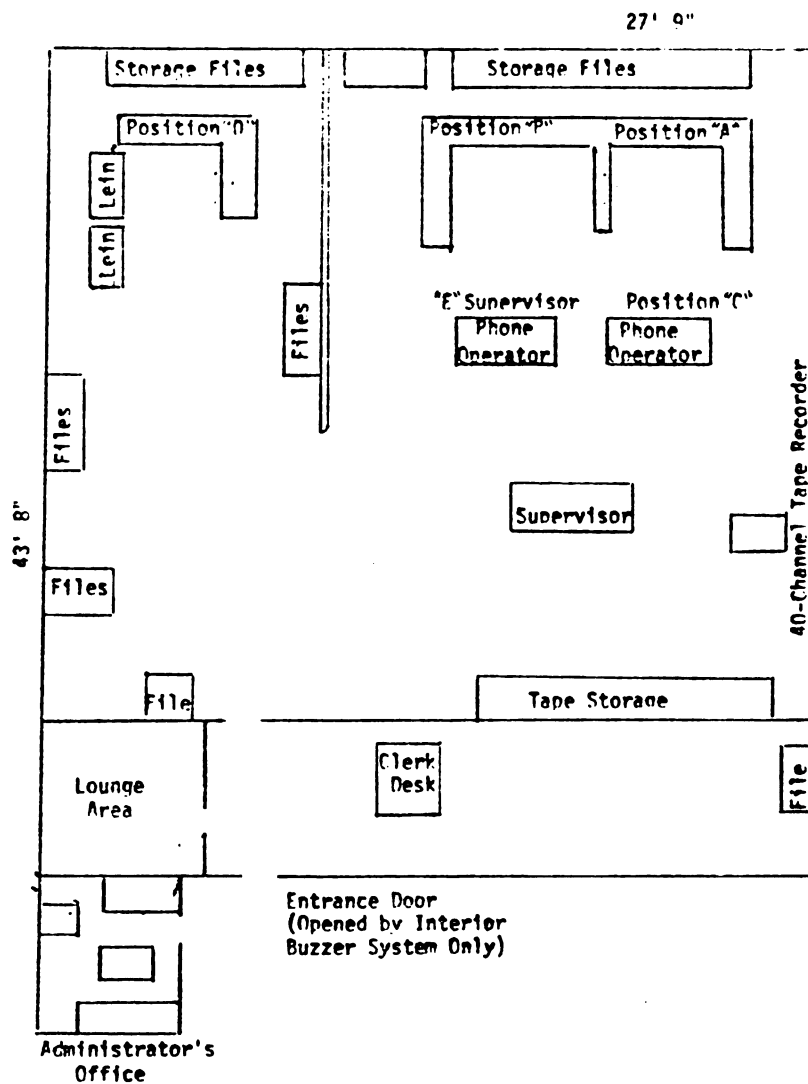


EXHIBIT D.--Central Police Dispatch Communications Center. (Excerpt from Central Police Dispatch: An Exemplary Project, LEAA 1974.)

articles addressed problems in planning for 911, in New York and Detroit, and the third article addressed the options of a 911 System to be utilized in Alameda, California.

All three articles identified the

... major obstacle to implementation of 911 in metropolitan areas has been the 'overlap' problem--non-alignment of phone switching boundaries with those of the involved public safety jurisdictions.¹⁷

Detroit and New York, after the implementation of 911, experienced a 40 percent and 50 percent increase, respectively, in calls for service. In New York, the key to the success of a 911 E.T.S. was identified as "... quick answers to 911, effective development and handling of data, prompt radio transmissions, and a response fleet that is adequate to the need. . . ."¹⁸

In the Alameda 911 E.T.S., features discussed in previous publications were addressed and a new important feature, a micro-computer, was included. Features such as computerized police and fire beats, and address location files would be possible. The Alameda system began the combination of two components of the Police System: a 911 E.T.S. and the inclusion of a microcomputer to provide computer assisted dispatching.

Study for Alameda County: 911¹⁹ prepared under a federal grant from the National Institute of Law Enforcement and Criminal Justice, provided an indepth look at the planning of a 911 E.T.S.

¹⁷Ibid., p. 11.

¹⁸Ibid., p. 9.

¹⁹Alameda Regional Criminal Justice Planning Board, Study for Alameda County: 911, Oakland, California: Office of Criminal Justice Planning, 1974.

The key project findings with regard to system features are presented in Exhibit E (page 26). The study examines each of the following alternatives:

1. selective routing;
2. automatic number identification (ANI);
3. automatic location identification (ALI); and,
4. supplementary dispatch support data (SDSD).

Also examined was the technical limitations on the use of an originating number, alternative service plans, comparative call answer manning requirements and an evaluation of alternative A.L.I.-S.D.S.D. systems.

The key project findings (Exhibit E) established a formal system incorporating some of the features that began as concepts in the previous literature reviewed. This is important as it established a well planned model and included several components of the Police System.

1. 911 E.T.S.;
2. minicomputer; and,
3. multijurisdictional agreements.

In the actual planning for a 911 E.T.S., the Alameda Study "Appendices" were valuable in that they provided the mathematical equations and analysis techniques to determine the following:

1. How many answerers are needed to maintain the probability of delay below an accepted limit?
2. How long must delayed calls wait to be answered?
3. How much of the time are answerers idle (or busy?)

1. Selective routing appears to be the most feasible and cost effective method of providing 911 service in a complex metropolitan area with extensive overlap problems. The system's recurring cost--approximately 36 cents per phone number per year--is less than two-thirds the personnel cost of a centralized answer-the-transfer facility.
2. For reasons of individual privacy, the original plan to accomplish ALI by providing updated telephone directory files to a public safety computer system is much less acceptable to the community than one wherein subscriber information would be kept on a telephone company computer and released only when and while a 911 call is made.
3. A single modest minicomputer with large on-line storage could easily perform the ALI function for the 1,250,000 population of Alameda County. Although a second, serially connected minicomputer operated by the County would be necessary to append any SDSD (non-telephone information such as police beat, fire box and cross streets), a combined output could be displayed within two seconds of call answering.
4. Eighty-five to 90 percent of 911 calls would display a location suitable for dispatching purposes but only a quarter of the calls for fire and half the calls for police assistance originate at the exact address where the assistance is needed. Consequently, SDSD common to a small geographic area such as the side of a city block would have the greatest cost-effectiveness.
5. The display of a residential subscriber's name was found to have insufficient public safety value to offset the perceived threat to individual privacy, so long as the ALI has the installation location in detail, i.e., apartment number. Business and non-residential subscribers' names should be a part of ALI.
6. The acceptance by the general public of a 911 system with ANI and ALI is extremely high with only 5 percent reacting unfavorably to the idea. It would be acceptable to those most sensitive to the privacy aspects as long as an alternative method of summoning assistance anonymously is still available.
7. The value of 911 systems with automatic number identification was judged much greater than those without it. The additional value of having ALI and SDSD must await determination in an actual operational trial.

EXHIBIT E.--Key Project Findings, Alameda County. (An excerpt from "Study for Alameda County 911.")

4. What is the effect of various answering disciplines?²⁰

Explained were the "Poisson Distribution" and the "Erlang C Equation." This demonstrated how to determine probability of delay of an emergency call based upon the number of operators and number of incoming calls. It also illustrated the probability of delay of an emergency call based upon the "busy time" of the operators and the number of operators.

In order to perform the analysis, initial data had to be obtained and this established initial data gathering categories for the Police System. Thus, this text was one of the basic foundations for the beginning of data gathering.

A series of "how to" books were prepared by the Jet Propulsion Laboratory, California Institute of Technology. These texts provided the basic knowledge of how to plan the various components of the Police System. These texts explained system concepts, the planning process, management of multijurisdictional systems, analysis of planning data, system design and the plan of implementation. The texts utilized in the design of the Police System were:

1. Multi-Community Command and Control Systems in Law Enforcement, "An Introductory Planning Guide,"²¹
2. Application of Computer-Aided Dispatch in Law Enforcement.²²

²⁰Ibid., p. F-1.

²¹Jet Propulsion Laboratory, California Institute of Technology, Multi-Community Command and Control Systems in Law Enforcement, Pasadena, California, March, 1976.

²²Jet Propulsion Laboratory, California Institute of Technology, Application of Computer-Aided Dispatch in Law Enforcement, Pasadena, California, December, 1975.

Each of these texts set forth the parameters of the system discussed, outlines the data to be gathered and presents mathematical equations to provide decision making information. These texts also incorporated the use of computers and discussed the types of hardware and software available. The available software features are discussed and the benefits outlined. Computer capabilities were also presented.

Additional valuable information provided is the location of systems now in operation, the features of those systems and the companies that manufactured the system equipment and software. This provided additional sources of reference for the planning effort.

Appendix A will provide a detailed outline of the most important information provided in the two texts from the Jet Propulsion Laboratory. The vast amount of groundwork and specific reference material obtained from these texts cannot receive adequate review in this chapter.

Successful System Documentation

After reviewing the basic planning documents the next step was to begin a review of documentation from operational successful systems, to determine the methodology of their planning, components of their system(s), and the features of each component. With this information, an analysis of those systems determined their strong points and ways to improve the systems in the design of the Police System.

Two successful systems have already been reviewed: Alameda County, and Muskegon Central Dispatch. These materials were utilized

in the planning effort and in the analysis of systems effort. Also utilized as an example of a successful operation was the Dallas, Texas Police Department Real-Time Tactical Deployment Project: System Specifications and Implementation Report.²³

The Dallas System as illustrated in Exhibit F, provided an on-line information retrieval capability from the offense statistical record file, vehicle file and suspect file. The system allows an interactive search and analysis with the user being able to specify the parameters such as date, times, crime types and areas. This documentation provided a base from which to build on. An immediate addition to the system would be a verify and edit terminal to confirm the entries of the on-line data entry terminal.

As related to the Police System the booking function and computer-aided dispatching information would also be interfaced. The Dallas System provided an initial group of files important to an on-line system. This was pertinent to the development of the Police System.

Huntington Beach Police Department (California) implemented a Computer-Aided Dispatch System (CAD) with the following features:

1. two way mobile digital;
2. computer-aided dispatch;
3. complaint backlog and priority file;
4. instant complaint recall;
5. automatic teleprinter messages;

²³System Development Corporation, Real-Time Tactical Deployment Project: System Specifications and Implementation Report, Dallas, Texas, May, 1974.

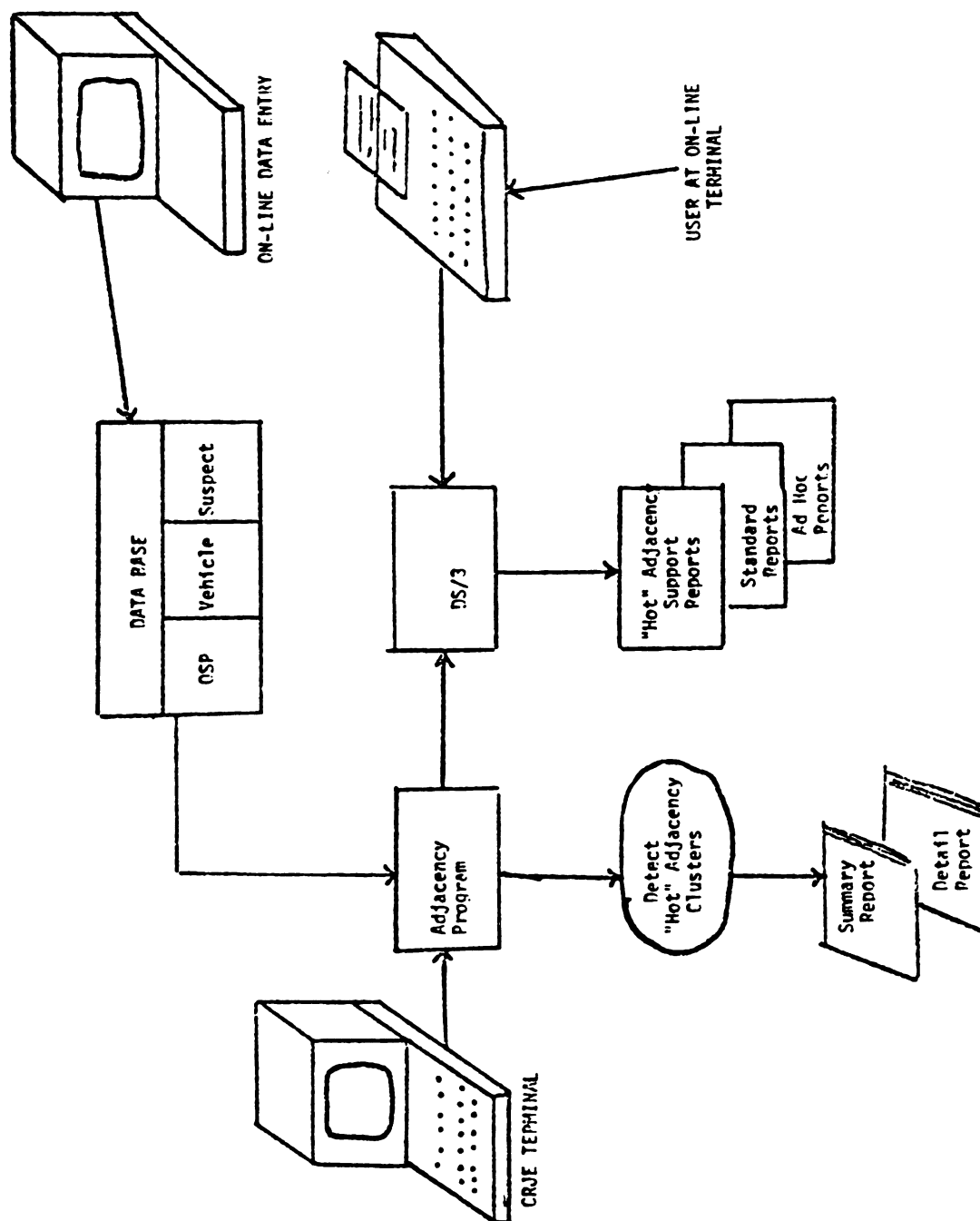


EXHIBIT F.--Real-Time Deployment System Flow. (Excerpt from Dallas Police Department's Real-Time Tactical Deployment System, by Systems Development Corporation, 1974.)

6. automatic hardcopy printing of complaint and status changes;
7. police vehicle and personnel files; and,
8. National Crime Information Center interface.

This system as outlined in Exhibit G also included the fire department in the CAD system.

The documentation from this system was important because one of its objectives was ". . . to ascertain the feasibility of transferability of the system to cities in population groupings from 100,000 - 250,000."²⁴ This was important to the development of the Police System. Also the files and features of the Huntington Beach System provided an initial system from which to pattern development of the Police System

The Basic System consists of two mini-computers and associated peripheral equipment.

Computer I will contain the following software programs: Complaint Operation function, Dispatcher incident and Status function, Vehicle Availability File, Personnel Identification Assignment File, Access to Orange County Automated Message Switching System, teleprinter control Records Clerk functions, Alarm Report and Fire System.

Computer II is used as a backup unit to take over for Computer I during periods of maintenance or breakdown.²⁵

Exhibits G and J on the following pages illustrate the interface of the various subsystems to the CAD System and the files of the CAD System.

²⁴Huntington Beach Police Department, "Computerized Command and Control," Huntington Beach, California, 1975, Section I, p. 2.

²⁵Ibid., Section IV, pp. 1-3.

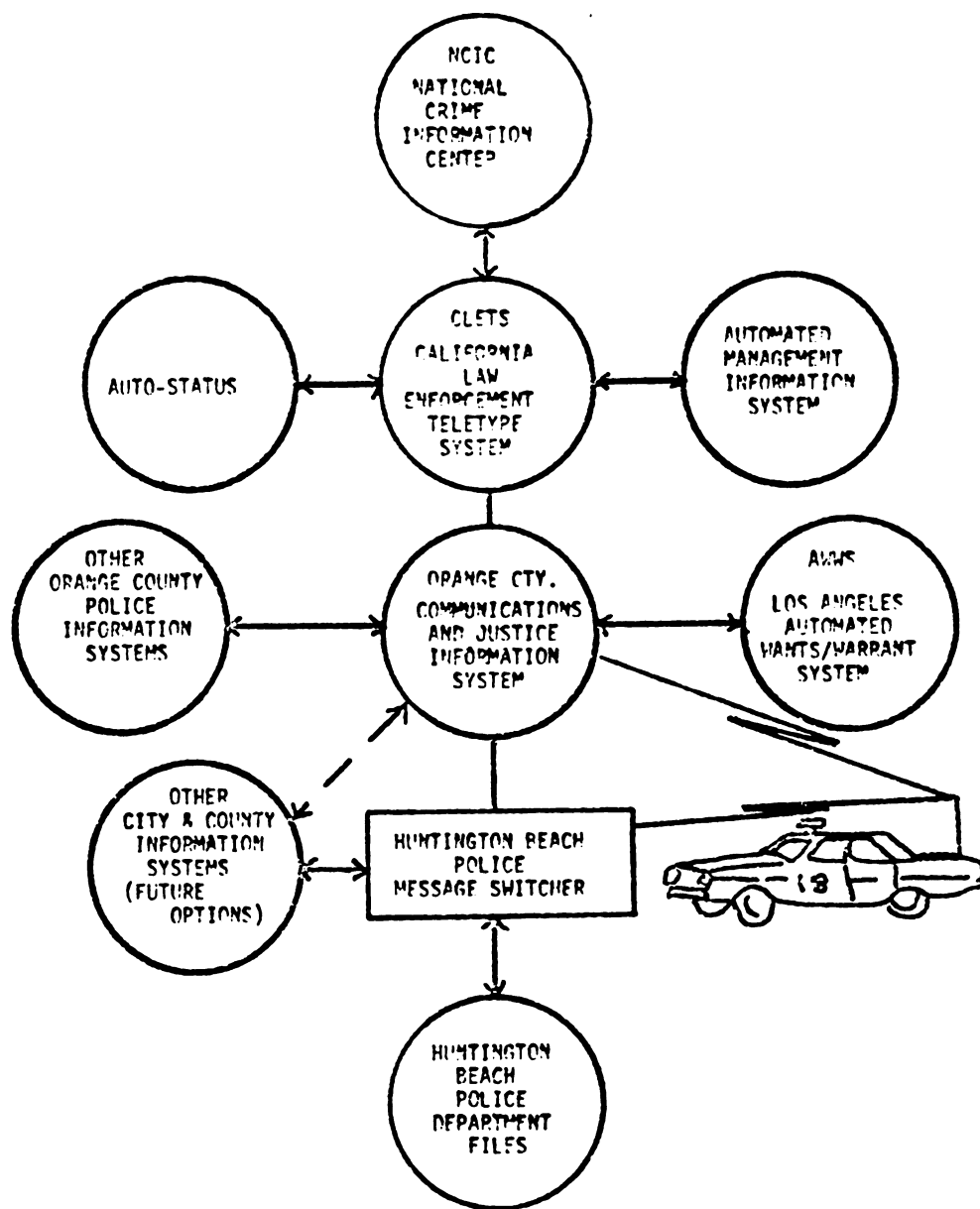


EXHIBIT G.--Huntington Beach Computer-Aided Dispatch. (Excerpt from Motorola Proposal to Huntington Beach, California, 1973.)

Successful systems in the larger departments began to flourish, and thus the Computer-Aided Dispatch System began to standardize with regard to features. This made production easier for the vendors and less costly to the consumer/user.

In a presentation submitted to the Lansing Police Department, the following components were identified as a standard CAD package. Exhibit H identifies the standard hardware components and Exhibit I identifies the standard software components of a CAD System.

The basic features of the standard system were illustrated in the CAD System flow chart, Exhibit J. These components and features outline a successful standard system. Standard systems also make uniform the planning information necessary for system design. Appendix A includes a sample survey adopted to obtain information for the Police System.

Documentation of Problem Systems

In reviewing the documentation of systems, few problems appeared; however, as visits were made to sites of operational systems, the troubles became apparent. Thus these systems will be discussed under the appropriate system design section.

Summary of Literature Review

The findings from the literature review can be itemized as follows:

1. History as to why the systems were developed.
2. National, State and Local guidelines for system development.

1. Central Processor
2. Core Memory
3. Computer Control Terminal
4. Disk Memory
5. Magnetic Tape
6. CRT/Keyboard Terminals
7. Printers
8. Interfaces and Modems
9. Control Center Consoles
10. Base Stations and Microwave
11. Mobile Data Terminals
12. Mobile Teleprinters
13. Mobile Status/Message Units

EXHIBIT H.--Hardware Components of a CAD System. (Excerpt from Motorola CAD Proposal, presented to the Lansing Police Department, 1976.)

1. Operating System
2. Utility Programs (assembler, loader, etc.)
3. Device Handlers
4. Applications Software
5. Diagnostic Programs
6. Software Documentation
 - a. CAD system operator's manuals
 - b. Computer system operator's manual
 - c. Operating system user's Documentation and Programming manuals
 - d. CAD applications Software Package including:
 - CAD System Flowcharts
 - CAD Program Listings
 - CAD Program Flowcharts
 - CAD Program Logic Flow Description
 - CAD File Descriptions and Layouts
 - CAD Record Descriptions and Layouts

EXHIBIT I.--Software Components of a CAD System. (Excerpt from Motorola CAD Proposal, presented to the Lansing Police Department, 1976.)

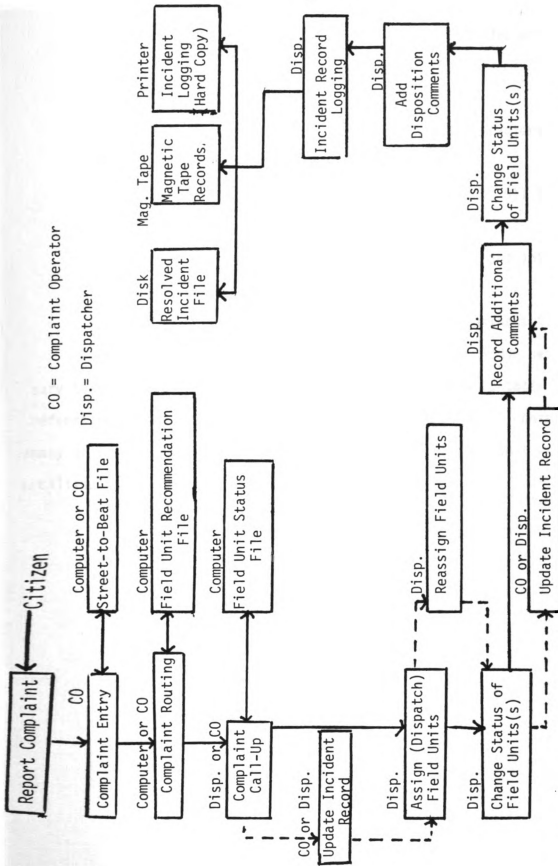


EXHIBIT J.--CAD/Complaint Entry Flow Chart. (Excerpt from Motorola CAD Proposal presented to the Lansing Police Department, 1976).

3. Pre-design planning data required for system design.
4. Means to analyze the data gathered.
5. Familiarization with existing system.
6. Design and layout of existing communications centers.
7. Design and operation of existing systems.
8. Desirable features of computer-aided dispatch, 911 E.T.S. and real-time information systems.
9. Familiarization with basic computer hardware and software capabilities.
10. Identification of vendors in the "systems business."

Reviewing the literature provided the basic knowledge necessary to begin the aspects of research and design. Many contacts and referrals were obtained through the literature. Appendix A contains many of the detailed steps of data gathering and analysis that was utilized in the design of the Police System.

CHAPTER III

THE IMPLEMENTATION SITE

The Police System will be implemented at the Lansing Police Department, Lansing, Michigan. The Police System will serve all of Ingham County. Maps on the following pages will outline the project location and area served (Exhibits K and L).

The City of Lansing consists of approximately 457.9 miles of streets and alleys within an estimated 33.87 square mile area. Geometrically, the city has a rectangular configuration with the major city streets following a gridiron pattern.

Lansing, the capitol city of Michigan, is very much the urban heart of Mid-Michigan. Spreading out beyond the city limits, Greater Lansing reaches and wraps around several towns, even a good-sized city of East Lansing, Haslett, Okemos, DeWitt, Holt, Dimondale and Grand Ledge. In so doing, it overlaps into three different counties--Ingham, Clinton and Eaton--popularly known as the Tri-County area. The City of Lansing has a resident population of 131,546, with a Greater Lansing area population of 378,423.

The ethnic composition of the city is 86 percent white, 9 percent black and 5 percent that includes all other non-whites. Within the city, 23 percent of the residents are employed by the

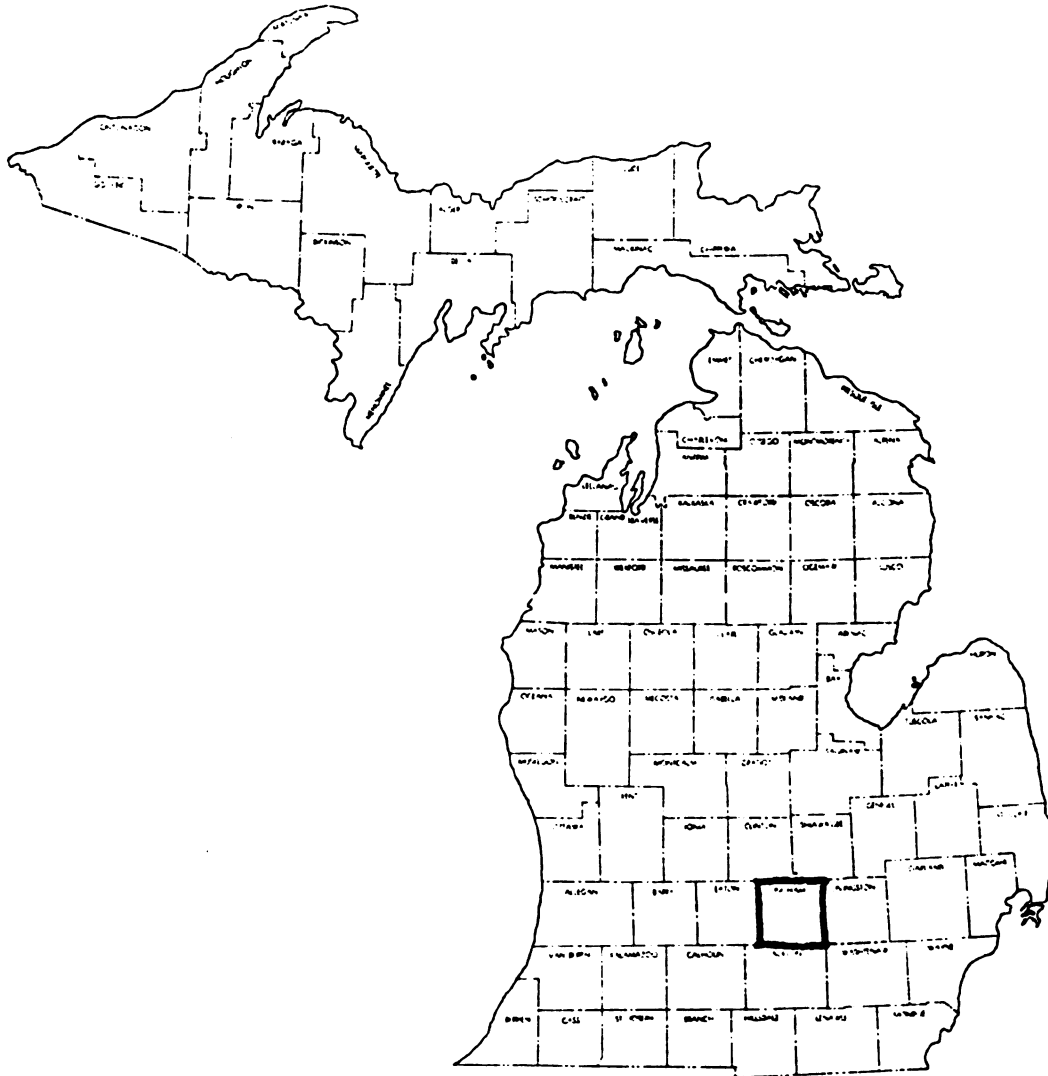


EXHIBIT K.--State of Michigan Map.

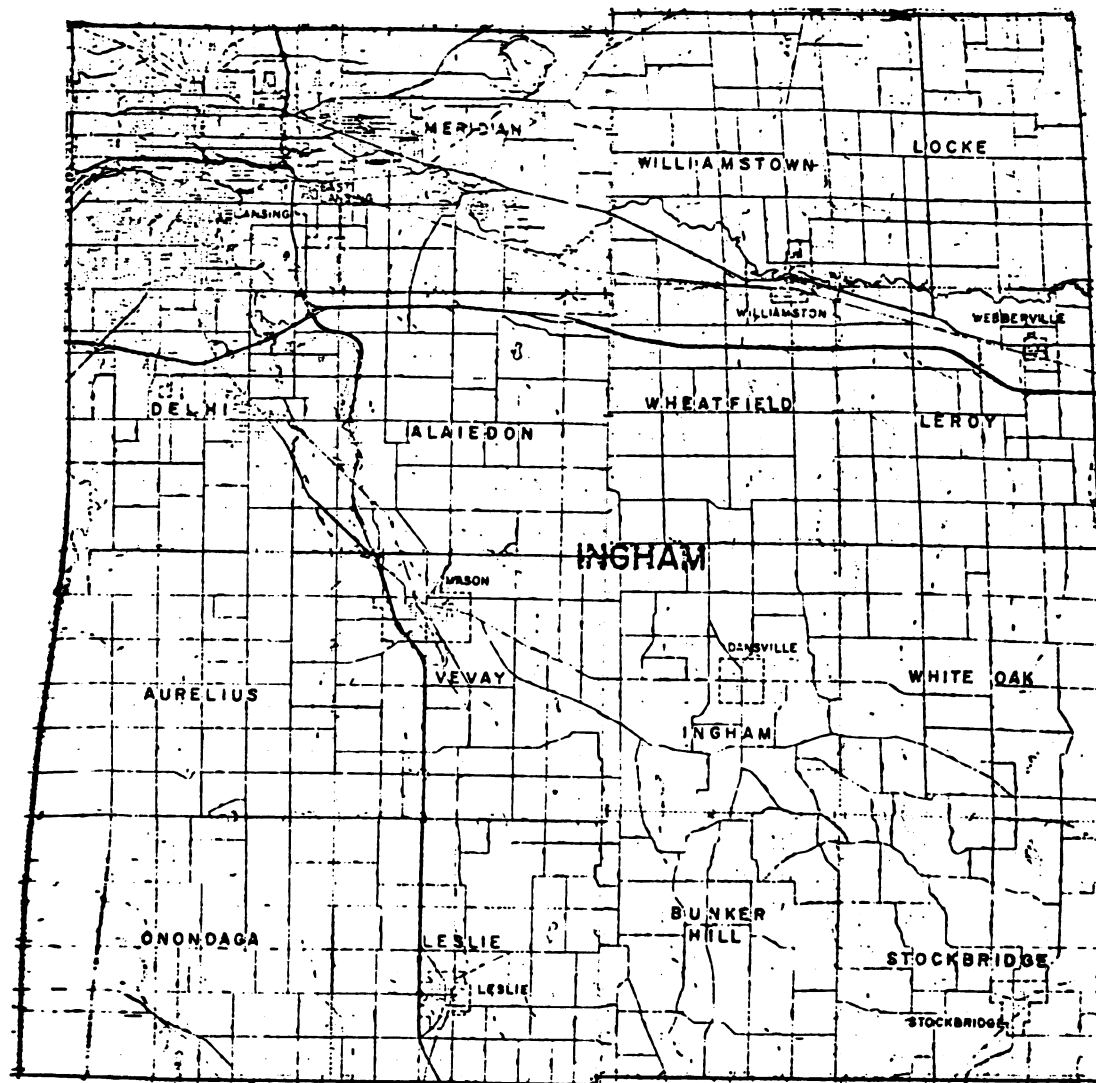


EXHIBIT L.--Ingham County Map.

various levels of government; 27 percent are employed by manufacturing, and 50 percent in non-manufacturing jobs.

The County of Ingham is composed of 261,000 persons, governed by 25 separate local units of government, having nine police jurisdictions, and encompassing 554 square miles. Lansing Community College is located in Lansing, and Michigan State University, with its 45,000 students is located in East Lansing.

Serving the approximately 300,000 persons (including students) living in the county are approximately 613 sworn officers at the local level and 45 Michigan State Police Officers, for a total of approximately 658 officers. Within the county are 11 police agencies, 12 fire departments and 10 agencies (public and private) that provide ambulance service (Exhibit M).

The Lansing Police Department was selected as the implementation site, for several important reasons. Lansing is the center of the metropolitan area, within the County and the Tri-County Region. Expansion of the Police System to include Eaton and Clinton Counties is viewed as fact within a few years after the System is operational. Thus the geographical center would provide a convenient location to assemble persons, equipment, and systems.

Secondly, and a critical factor, is that the Lansing Police Department was, at the time of selection, already involved in the utilization of computers and had programmers on their staff. The Department was familiar with the use of data processing techniques to assist in crime analysis, planning and manpower allocation functions.

Police Agencies

East Lansing
Ingham County Sheriff
Lansing
Lansing Township
Leslie
Mason
Michigan State University
Michigan State University Department
of Public Safety
Stockbridge
Webberville
Williamston

Fire Departments

Dansville
Delhi Township
East Lansing
Lansing
Lansing Township
Leslie
Mason
Meridian Township
Onondaga
Stockbridge
Webberville
Williamston

Ambulance Services

Archies Ambulance
Delhi Township Fire Department
East Lansing Fire Department
Lansing Fire Department
Lansing Mercy Ambulance
Leslie Ambulance
Meridian Township Fire Department
Stockbridge Ambulance
Williamston Fire Department

In addition, the Department had in use their own management information system titled Lansing Area Law Enforcement System (L.A.L.E.S.). The LALES program was an on-line system operated by the Central Records Division.

A third group of factors that influenced the location was Lansing, East Lansing, and Lansing Township had already established contractual agreements to implement a 911 Emergency Telephone System. Also, all agencies within the Tri-County area were operating on a Tri-County Radio System. This allowed any police agency in the Tri-County area to have radio contact with any other Tri-County agency. The Tri-County Radio System was upgraded to the 460 MZ frequency and currently operates most efficiently.

It was technically the best decision to locate the Police System in Lansing for a variety of reasons. Lansing has four main radio channels and its own microwave system. To locate the Police System in any other area of the region would require major modification of the radio frequency system and reallocation of channels. This would also apply to the radio frequencies of the agencies dispatching fire and ambulance services. The majority of agencies in the Tri-County area only have one main frequency.

The final point was that no other agency within the County had adequate facilities to house the components and staff of the Police System.

Ingham County provided an excellent location to implement the Police System for a variety of reasons. The Office of Criminal Justice Programs was looking for a site to implement a model program.

Ingham County is easily accessible from throughout the state, and is directly adjacent to the Office of Criminal Justice Programs which will monitor the project. Another important consideration is that a state-wide evaluation was undertaken to locate a site for a Law Enforcement Management System, and the recommendation indicated that the only suitable location would be the Lansing Police Department.

The final important factor was at the time of the selection of the Lansing Police Department (Ingham County area) no other agency had submitted a proposal of this magnitude.

To summarize, the Police System will be implemented at the Lansing Police Department because of the favorable demographic and geographic factors, the advanced level of technology of the Department and its staff and the already existing sophisticated radio system operating in the region. This was supplemented by the availability of facilities to house the system and its staff.

CHAPTER IV

DEVELOPMENT OF A DATA BASE FOR SYSTEMS DESIGN

Having defined the area that the Police System will serve, the gathering of raw data became the next procedural step. Insight into the types of data to be gathered and methods to utilize the data in decision making was obtained from two basic sources. First, in reviewing the literature a number of formulas were presented. These formulas set forth the types of preliminary data that would be required. Second, a Pre-Assignment Survey Form used by Motorola Communications Incorporated was adapted to meet the needs of our particular area and need for information.

The Pre-Assignment Survey Form was adopted for use in the development of the data for the following reasons. First, its format asked for the data necessary in the collection effort as outlined in the planning documents reviewed in Chapter II. Second, adaptation to our needs was easily accomplished because it was almost acceptable in its original form. Also, Motorola, Inc. had been using the form internally as their planning guide and they appeared to be a front-runner in this type of system planning and installation. Finally, this form would gather the data that the Office of Criminal Justice Programs had requested to be submitted to them.

Appendix A exhibits the formulas that were obtained through the readings and a sample of the Motorola Survey Form. The revised form utilized by the Lansing Police Department is presented in Appendix B. The revisions in the form included the addition of square miles served by the responding Department (page 1) and the restructuring of the Number of Calls for Service Section (page 2) to breakdown the stages of service calls obtained. Rather than obtaining only the number of calls for service, the information requested was:

1. calls received by the switchboard;
2. calls received by Complaint Board Operators; and,
3. the number of calls dispatched.

A section added to the survey form addressed the type and number of Law Enforcement Information Network (LEIN) messages sent over a three year period. Deleted from the Motorola Survey was the last section which referred to purchasing. This was unnecessary information, as all purchases would be accomplished through the City of Lansing via the grant awards.

The initial information to be gathered was the agencies within Ingham County, both Police and Fire, that would be served by the Police System. Fire agencies were included because many Out-County Fire Departments are dispatched through the Ingham County Sheriff's Department. Also identified were private ambulance services that may have opted to be connected into the dispatching portion of the Police System. The list of possible participating agencies included the following.

Police Agencies

Lansing Police
 East Lansing Police
 Lansing Township Police
 Mason Police*
 Michigan State Police (Station 11)
 Michigan State University, Department of Public Safety
 Ingham County Sheriff's Department
 Delhi Township*
 Meridian Township*
 Stockbridge*
 Leslie*
 Webberville*

Fire Agencies

Lansing Fire/Ambulance
 East Lansing Fire/Rescue
 Delhi Township Fire/Ambulance*
 Dansville Fire*
 Leslie Fire
 Mason Fire*
 Meridian Township Fire/Ambulance*
 Onondaga Township Fire*
 Stockbridge Fire*
 Webberville Fire*

Private Ambulance Service

Archie's Ambulance
 Lansing Mercy Ambulance
 Leslie Ambulance Service
 Stockbridge Ambulance Service

*These agencies are dispatched at least part-time by the Ingham County Sheriff's Department.

Agencies that received and responded to the Informational Survey Form for the 911 Computer-Aided Dispatch Communications Center were:

Lansing Police Department
 Lansing Fire Department
 Ingham County Sheriff's Department
 Lansing Township Police Department

It should be noted that the Sheriff's response included information about the police agencies dispatched by the Sheriff. The detailed responses to these questionnaires are contained in Appendix B. All other agencies were surveyed by telephone to obtain the necessary information, and these responses are presented in Appendix B. Also some information was obtained through Annual Reports

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submitted to the Lansing Police Department. The two tables that follow represent a summary of the type of numbers information gathered through the surveys. Narrative responses are detailed in the surveys in Appendix B.

Time studies were undertaken within the Lansing Police Department to determine the amount of time spent performing each dispatching function, and the peak times of congestion of existing radio frequencies. The tables on pages 49 - 51 illustrates the results of these surveys. Appendix B contains a sample of the graphs made when monitoring frequency usage. The results of the survey indicated that Lansing's main patrol channel was exceeding a 50 percent utilization rate during peak times. Peak hours were as follows:

<u>Time</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
1500-0100	55.99%	51.01%	55.19%

A detailed breakdown of calls for service by time is presented in Appendix B, page 218.

The following are general totals used in decision making. These totals were obtained from the survey data and then analyzed by the formulas recommended by the Jet Propulsion Laboratory.

Calls for Police Service

- | | |
|---|-----------|
| 1. Ingham County 1975 | 151,615 |
| (a) 10 percent increase for 1976 | |
| (b) 25 percent increase due to 911 | |
| 2. Projected calls for police services (1977) | 204,680 |
| 3. Dispatcher peak call rate/hour | 33 calls |
| 4. Switchboard peak call rate/hour | 428 calls |

Area	554 Square Miles
Population (including the University)	300,000
Police Officers	
Local	613
State	45
TOTAL	658
Total Officers Assigned to Patrol	521
Total Officers on Duty at Peak Times (1500-0100)	176
Local Governing Units	25
Police Jurisdictions	9
Marked Police Vehicles	84
Call Volume 1975 (estimated)	151,615
Call Volume 1976 (estimated)	166,777
Call Volume--Daily Average	571

Police Agencies	Total Patrol Officers	Total Patrol Vehicles	Officers Peak Time Hours	Vehicles Peak Time Hours
Lansing	271	28	35	20
East Lansing	52	14	10	5
Ingham County Sheriff	100	24	70	17
Delhi Township	12	5	9	4
Lansing Township	18	6	5	3
Meridian Township	20	10	14	7
Stockbridge	3	2	2	1
Mason	7	3	5	2
Leslie	3	2	2	1
Webberville	3	1	2	1
Michigan State Police	32	18	22	13
TOTAL	521	113	176	74

EXHIBIT N.--Total County Statistics, 1976.

<u>Frequency</u>	<u>Assigned</u>
460.050	Tri-County Channel
460.200	L.P.D. Patrol Channel
460.300	County-Wide L.E.I.N. Channel
460.350	Out-County Patrol Channel
460.375	E.L.P.D. and L.T.W.P. Patrol Frequency
460.400	County-Wide Detective Bureau Channel
460.500	L.P.D. Surveillance and Car to Car
460.275	M.S.U.D.P.S. Patrol Channel

VEHICLE DISTRIBUTION			
Agency	Number of Vehicles for Patrol	Detective Vehicles	Total Vehicles
Lansing	44	44	106*
E. Lansing	7	8	15
Lansing Twp.	3	3**	6
I.C.S.D.	15	4	19
Meridian Twp.	5***	3**	10*
Delhi Twp.	3	2	5
Stockbridge	2***	--	2
Leslie	2***	--	2
Mason	2	1****	3
Webberville	1	1	1*

*Total number of vehicles does not include all vehicles available to that Department.

**Includes Director's car.

***Includes one backup

****Includes Chief's car.

EXHIBIT 0.--Frequency Assignment/Vehicle Distribution by Agency.

Function	Time Required--Manual (L.P.D.) System Average Times	Net Time Consumed
I. DISPATCHING UNDER THE EXISTING SYSTEM		
Record Response Time	18 seconds per call	755 manhours/year
Enter File Number	4 seconds per call	167.8 manhours/year
Type Radio Log	20 seconds per call	838.9 manhours/year
Record Status by Time	4.2 seconds per call	704.6 manhours/year
TOTAL Manhours Involved in Dispatching		2,466.3 manhours/year
II. COMPLAINT ENTRY PROCESS--EXISTING SYSTEM		
Write Complaint Number	4 seconds per call	50.1 manhours/year
Call Sorting, Area and Priority	6 seconds per call	252.1 manhours/year
Transfer Complaint to Dispatcher	6 seconds per call	252.1 manhours/year
TOTAL Manhours in Complaint Entry Process		554.3 manhours/year
III. TIME IN PATROL VEHICLES RELATED TO DISPATCHING		
Write Dispatched Information	30 seconds per call	1,258 manhours/year
TOTAL Manhours Involved in Vehicle		1,258 manhours/year
GRAND TOTAL--Manhours Involved--Manual System		42,786 manhours/year

EXHIBIT P.--Workload Represented in Manhours.

- | | |
|--|-----------|
| 5. Complaint Board Operator peak call
rate/hour | 124 calls |
| 6. LEIN peak call rate/hour | 84 calls |

The formulas on page 53 were utilized to perform basic initial system design answers for the planning of the 911 Emergency Telephone System.

Summary of Data Collection Efforts

After recognizing the types of data that had to be assembled, problems began in the collection of that data. The difficulty centered around obtaining data from past years. Many organizations kept only informal records, or published no annual reports that would contain the necessary data. This was particularly true in the cases of out-county Fire Departments. The majority of these organizations are volunteer agencies with little formal data collection methods.

Another factor that required careful analysis of the data is that the Ingham County Sheriff's Department provides some support services such as dispatching and LEIN capabilities to the various townships. As an example, LEIN traffic for Lansing Township is processed through the Sheriff's Department, thus Lansing Township has no record of the volume of their traffic. Also, when the Sheriff's Department considers the population served, they include the total population of the county, including those persons living in an area ~~that~~ is served by another agency (example: the City of Lansing).

These and other factors made the data gathering process a ~~time~~ consuming effort that required confirmation of the information ~~provided~~. The numbers presented in this chapter became the basis for ~~the~~ design of the 911 Emergency Telephone System.

Formulas/CalculationsFormulas

$$\text{Complaint Board Operators} = \frac{\text{mean service peak call rate-time in seconds}}{\text{seconds/hour}}$$

$$\text{Delay} = \frac{\text{mean waiting time in seconds}}{\text{mean operator service time in seconds}}$$

$$\text{Number of Dispatchers} = \frac{\text{case load}}{\text{cases per dispatcher}}$$

Calculations

$$1. \text{ CBO} = \frac{124 \text{ call--90 seconds}}{3,600 \text{ seconds}}$$

$$\text{CBO} = 3.1 \text{ load units}$$

$$2. \text{ Delay} = \frac{10}{90}$$

$$\text{Delay} = .111 \text{ units}$$

(refer to page 23,
Figure 6, Jet
Propulsion CAD)

$$\text{Number CBO needed} = 6$$

$$3. \text{ Incident dispatchers} = \frac{33}{25}$$

$$\text{Incident dispatchers} = 1.32$$

$$\text{Number Incident Dispatchers Needed} = 2$$

$$4. \text{ LEIN Dispatchers} = \frac{84}{25}$$

$$\text{LEIN Dispatchers} = 4$$

$$\text{Number LEIN Dispatchers Needed} = 4$$

CHAPTER V

DESIGNING THE 911 EMERGENCY TELEPHONE
SYSTEM

Background Information

In addition to the reasons presented in Chapters I and II, the need to expedite requests for emergency services were based in part on:

1. a spiraling crime rate;
2. an increase in calls for emergency services;
3. a limited number of emergency services personnel; and,
4. outdated and inadequate communications equipment.

The specific goals of the 911 Emergency Telephone System (E.T.S.) are:

1. to provide for efficient and simplified communications between emergency services and the public it serves;
2. to increase the reported number of emergencies and criminal activities;
3. to increase the rate of criminal apprehensions during the commission of the crime; and,
4. to produce a reduction in the total emergency response time, as measured from the time of detection of an incident to the time of notification to an agency.

In light of the goals, the overall objectives of the 911 Emergency Telephone System are:

1. To provide the minimum number of contact points between the calling citizen and the responding agency.
2. To control the quality of emergency responses to telephonic requests for service and information.
3. To provide, as an absolute maximum, the capability for answering an emergency line within ten seconds.
4. To provide the recording of all telephonic and radio conversations.
5. To increase citizen involvement.

The following items were identified as benefits of the 911 Emergency Telephone System.

1. An easy number to remember.
2. Only one number to dial to obtain any emergency service.
3. An easy number to locate and dial.
4. Toll free access to emergency services.
5. Participation in a universally recognized emergency services phone number.
6. Special benefit to travelers and new residents.
7. Potential reduction in total response as measured from the time of detection to the arrival of an emergency services unit.
8. Increased public confidence in the ability of emergency resources to respond to their needs.

In light of this background information, the next consideration is that of factors that affect the design and operation of the system.

Design Considerations

There are a number of factors affecting the design of the 911 E.T.S. outlined in Chapters I and II. Primary among these is that a Computer-Aided Dispatching System must be implemented simultaneously with the 911 Emergency Telephone System to obtain federal funds. Second, all other Law Enforcement Agencies within the county must participate. Finally, the grants will only provide money for police services.

Although these mandates significantly increased the difficulty in the planning and design of such a system, it appears that these are logical mandates. The policy of the Office of Criminal Justice Programs appears to be that they are attempting to avoid the duplication of equipment and costs. Also, they are inviting local governments to coordinate their activities, standardize and improve the delivery of emergency services and in so doing promoting a cost effective mode of operation.

Additional considerations that influence the design are that early in the discussion stages of such a system it was decided that the ultimate goal of the 911 Technical Committee (January, 1974) was to implement a Tri-County Centralized Dispatch that would receive calls for all emergency services. This meant that fire and ambulance services had to be included.

The final and unnegotiable influence on system design was the state-of-the art of telephone technology. Within the county, a number of telephone exchanges do not have compatible equipment with the ability to perform like functions. Also, the age of the equipment in the Phone Company's home office prohibits some features of existing 911 E.T.S. Having identified the goals, objectives, and limitations involving the 911 E.T.S., the next task became the basic design and staffing requirements. It must be remembered that the Computer-Aided Dispatching System was scheduled for a simultaneous implementation. This factor and its influence will be discussed in this and the next chapter.

Operation and Staffing

In determining the staffing requirements, a number of operational decisions had to be made. As the data base was established (Chapter IV) it became apparent that the majority of police agencies had one contact point for a citizen requesting service. The operator answering the call also took the complaint information. This was an acceptable system in departments where the call volume was low.

In the Lansing Police Department the caller had to state the nature of the call to the operator and then repeat it to the complaint taker. This appears inconvenient to the caller, but in reality allows for faster service--because of the high volume of calls.

Both systems described have the same major shortcoming: at peak times the caller will have to wait. To remedy this problem three alternative methods were identified to staff and operate the

911 Emergency Operations Center (E.O.C.). First, having incoming calls answered by a Complaint Board Operator (C.B.O.) and having a dispatcher whose only function is dispatching. Second, having C.B.O. answer incoming calls and a dispatcher who dispatches and processes queries to remote data banks (i.e., LEIN). The final method was a dispatcher that would answer incoming calls and dispatch, but queries to remote data banks would be handled by another person.

The first alternative was selected. This method accomplished a number of the objectives. It established the minimum number of contact points between the caller and service. By reducing the number of contact points, response time from the time the incident is identified to the point of dispatch would be reduced. Also, the caller will state the nature of the call only once, and no transfer will be involved. Under this system, dispatchers will handle a minimum of telephone traffic. That provides dispatchers the ability to concentrate on servicing field units, while at the same time reducing their "busy time" to a less stressful level. Finally, a new position would be established, the Remote Data Base Operator. This position would be dedicated to processing queries to the LEIN, and other remote data banks. This is a function that will be relieved from the current dispatching responsibilities in some departments. The alternative selected also conforms to the recommendations of the Jet Propulsion Laboratory. Staffing requirements for peak times were calculated for all three alternatives and are presented in Appendix C. The first alternative with a C.B.O. answering incoming calls, a Dispatcher dispatching only, and a Remote Data Base Operator also

required the least amount of personnel. The two charts that follow represent the existing method of staffing and number of personnel at the Lansing Police Department and the number of personnel required at each position to service the entire county under the 911 E.T.S.

As the charts reflect, the number of personnel does increase by three persons, or 7 percent. It should be noted that by increasing personnel by this amount the population being served will increase from approximately 134,000 to 300,000--an increase of over 50 percent.

Other important considerations in the staffing arrangements are that participating agencies do not have to employ, train and pay personnel to staff their individual communications centers. By contract these agencies will only pay for a portion of the personnel assigned to the E.O.C. Also, each participating agency will be able to reduce the amount of communications equipment at their facility; thus reducing their operation and maintenance costs. Thus by participating in the 911 Emergency Telephone System, agencies will obtain a more cost effective method of receiving and dispatching calls for emergency services.

Michigan Bell Telephone of Lansing, also computed staffing levels for the E.O.C., independent of the projections made by the Lansing Police Department, and obtained the same results. These results are presented in Appendix C. The answers they obtained were calculated considering the speed of answer or queuing delay acceptable to Michigan Bell, ten seconds, and acceptable to the Lansing Police Department, five seconds. With appropriate number of personnel

Present
LANSING POLICE

Communications Center

March, 1977

DIVISION COMMAND
1-Captain VI

Total Personnel

3-Sergeant III
3-Corporal II-A
12-Police Officer I
10-Technician III-A
11-Clerk I-B

39-Total Personnel

ASSISTANT DIVISION COMMAND
1-Lieutenant V
1-Lieutenant IV

PLATOON # 1	PLATOON # 2	PLATOON # 3
Supervision	Supervision	Supervision
1-Sergeant III	1-Sergeant III	1-Sergeant III
1-Corporal II-A	1-Corporal II-A	1-Corporal II-A
Dispatch/Complaint Receiving	Dispatch/Complaint Receiving	Dispatch/Complaint Receiving
4-Police Officer I	4-Police Officer I	4-Police Officer I
2-Technician III-A	2-Technician III-A	
LEIN Operator	LEIN Operator	LEIN Operator
1-Technician III-A	1-Technician III-A	1-Technician III-A
1-Clerk I-B	1-Clerk I-B	1-Clerk I-B
Typist	Typist	Typist
1-Clerk I-B	1-Technician III-A	1-Technician III-A
	1-Clerk I-B	1-Clerk I-B
Switchboard Operator	Switchboard Operator	Switchboard Operator
2-Clerk I-B	1-Technician III-A	2-Clerk I-B
	1-Clerk I-B	

EXHIBIT Q.--Present Communications Center Personnel.

PROPOSED 911
INGHAM COUNTY

EMERGENCY OPERATIONS CENTER

(March, 1977)

911 EMERGENCY OPERATIONS CENTER
BOARD OF CONTROL

DIRECTOR OF 911
EMERGENCY OPERATIONS

Personnel Available
to Staff the Center***

3-Sergeant III
3-Corporal II-A
12-Police Officer I*
10-Technician III-A
11-Clerk I-B
3-Civilian Employees
_Provided by Other Agencies

DAY SHIFT

AFTERNOON SHIFT

NIGHT SHIFT

1-Supervisor
1-Assistant Supervisor**

1-Supervisor
1-Assistant Supervisor**

1-Supervisor
1-Assistant Supervisor**

2-Police Dispatchers
4-Complaint Board Operators
1-LEIN Operator

3-Police Dispatchers
6-Complaint Board Operators
2-LEIN Operators

2-Police Dispatchers
4-Complaint Board Operators
1-LEIN Operator

9-Total Positions to Staff

13-Total Positions to Staff

9-Total Positions to Staff

12-Number of Persons Available
to Staff Positions on a
Daily Basis

19-Number of Persons Available
to Staff Positions on a
Daily Basis

11-Number of Persons Available
to Staff Positions on a
Daily Basis

*It is anticipated that Police Officer I's will be reassigned to other police duties and will be replaced by non-sworn personnel.

** Assistant Supervisors will assume a work station when the shift supervisor is present.

*** 42 Total Personnel Available to Staff the Center.

EXHIBIT R.--Proposed Communications Center Personnel.

determined to operate the system, the next consideration was that of the features or capabilities necessary to make the 911 E.T.S. function at peak efficiency.

911 Emergency Telephone System Capabilities

The following are capabilities and features operational on various 911 Emergency Telephone Systems throughout the country. In Chapter II, the review of Alameda County's Study identifies the pro's and con's of these features.

- Automatic Location Identification (ALI). When the CBO answers an incoming call, a computer would automatically identify the location of the caller and display it to the CBO.

- Automatic Number Identification (ANI). When the CBO answers an incoming call, a computer would automatically identify the number the person was calling from and display it to the CBO.

- Automatic Ring Back. Should the CBO receive a call and the caller disconnects, the CBO could then ring the phone at the caller's location.

- Called Party Hold. A CBO receiving a call such as a bomb threat where the caller hangs up could then hold that line open until the number and location could be identified (traced).

- Forced Disconnect. Should someone attempt to monopolize the 911 trunklines by calling and not hanging up or not have an emergency call but refuse to disconnect, the CBO could disconnect-- or in the case of the first example, the system will disconnect in a given number of seconds.

- Automatic Call Distributor (ACD). Incoming calls are held in queue and routed to the first available CBO.

- Selective Routing. Incoming calls are identified by the exchange they originate from and are directed to the CBO servicing that area of the population.

- Direct Trunking. All CBO's have identical consoles with telephone exchanges identified (i.e., 482, 372). The calls ring on all consoles simultaneously and are answered by the first available CBO. The CBO can identify what area the caller is in by the exchange button on the console.

- Free Public Phone Access. The ability of a citizen to dial 911 from any public phone without depositing money.

- Trunk Transfer Capability. The ability of the system to allow a CBO to transfer a 911 call to another agency.

- Supplementary Dispatch Support DATA (SDSD). Information to assist CBO's and dispatchers in address verification, street names, location, etc. This information would be provided through a computer interface (C.A.D.).

- Teletypewriting Phone (TTY). This involves the interface of teletype equipment to the 911 system, that allows handicapped persons to communicate with the 911 CBO by typing out a message or through pre-taped messages.

The features described represent various levels of technology available throughout the country. Because of technological limits of the Lansing, Michigan Bell Telephone, only the following capabilities are included in the system design.

- Automatic Ring Back
- Called Party Hold
- Forced Disconnect
- Direct Trunking
- Free Public Phone Access
- Supplementary Dispatch Support Data
- Teletypewriting Phone Equipment

The capabilities presented have some disadvantages. The most important disadvantages are capabilities that are identified, but not available in this area. Those include: A.N.I., A.L.I., A.C.D., and Trunk Transfer Capability. These features would greatly enhance the accuracy and efficiency of the entire 911 E.T.S. - C.A.D. System. A second disadvantage is that because A.C.D. is not available, the system must revert to the Direct Trunking method. This method is the least desirable of the identified alternatives. Reasons for this are that on all consoles every incoming call will ring simultaneously until answered. Also, there will be no controlled system for queuing incoming calls.

A problem closely associated to this is the inability to transfer calls incoming on the 911 trunklines. This prevents calls from being transferred to the Fire Department, as an example. Thus there are many avenues that must be explored with regard to future capabilities of the system.

Projected System Capabilities

As the 911 Emergency Telephone System matures and expands, the following are capabilities that will become a reality as Phone Company Central Offices are upgraded.

- Automatic Number Identification
- Automatic Location Identification
- Automatic Call Distributors
- Trunk Transfer Capabilities

The Trunk Transfer Capability will be invaluable in that it would allow calls incoming on 911 trunklines to be transferred to crisis intervention centers, ambulance services and possibly directly to a psychologist. This would greatly enhance the ability of the citizen to obtain emergency services.

Thus far, the number of staff has been determined, method of receiving complaints and the features of the 911 system. The next step that relates to this subsystem of the Police System is the type of atmosphere and facility the persons operating the system will function in. The major considerations involved are:

- noise levels;
- efficiency;
- ability to function in both automated and manual modes;
- supervision;
- security; and
- available space.

It should be noted that these are major physical and/or mechanical problems. The emotional factors, stress considerations

and employee attitudes were addressed at a latter point in time through interviews with the employees and work by paid consultants. It is also important to recognize that the 911 E.T.S. is housed in the same facility as the Computer-Aided Dispatching System.

The first unchangeable fact is that the Lansing Police Department had the only available facility to house such a system. Security for the area and the system was developed by designing independent electrical and atmospheric control systems for the E.O.C. Access to the E.O.C. was designed to be limited and monitored by cameras and electric locking systems. Security precautions were developed and reviewed by the Crime Prevention Unit of the Lansing Police Department.

Two considerations that impact each other and influence yet a third are noise levels and efficiency. These items also affect the ability to function in an automated or manual mode, where the degree of verbal communication changes. The design of the E.O.C. with regard to noise had to consider increased personnel and equipment. Thus the location of each was important.

Supervision in the new E.O.C. requires new responsibilities. There are two functions to be considered: telephone answering and dispatching. The supervisor must have the capability to monitor his personnel and their traffic on the various types of equipment.

The charts on the following two pages represent the existing dispatch center and the proposed E.O.C. Both are located in the Lansing Police Department on the fifth floor of the building. In the existing center, there is no noise suppression techniques applied,

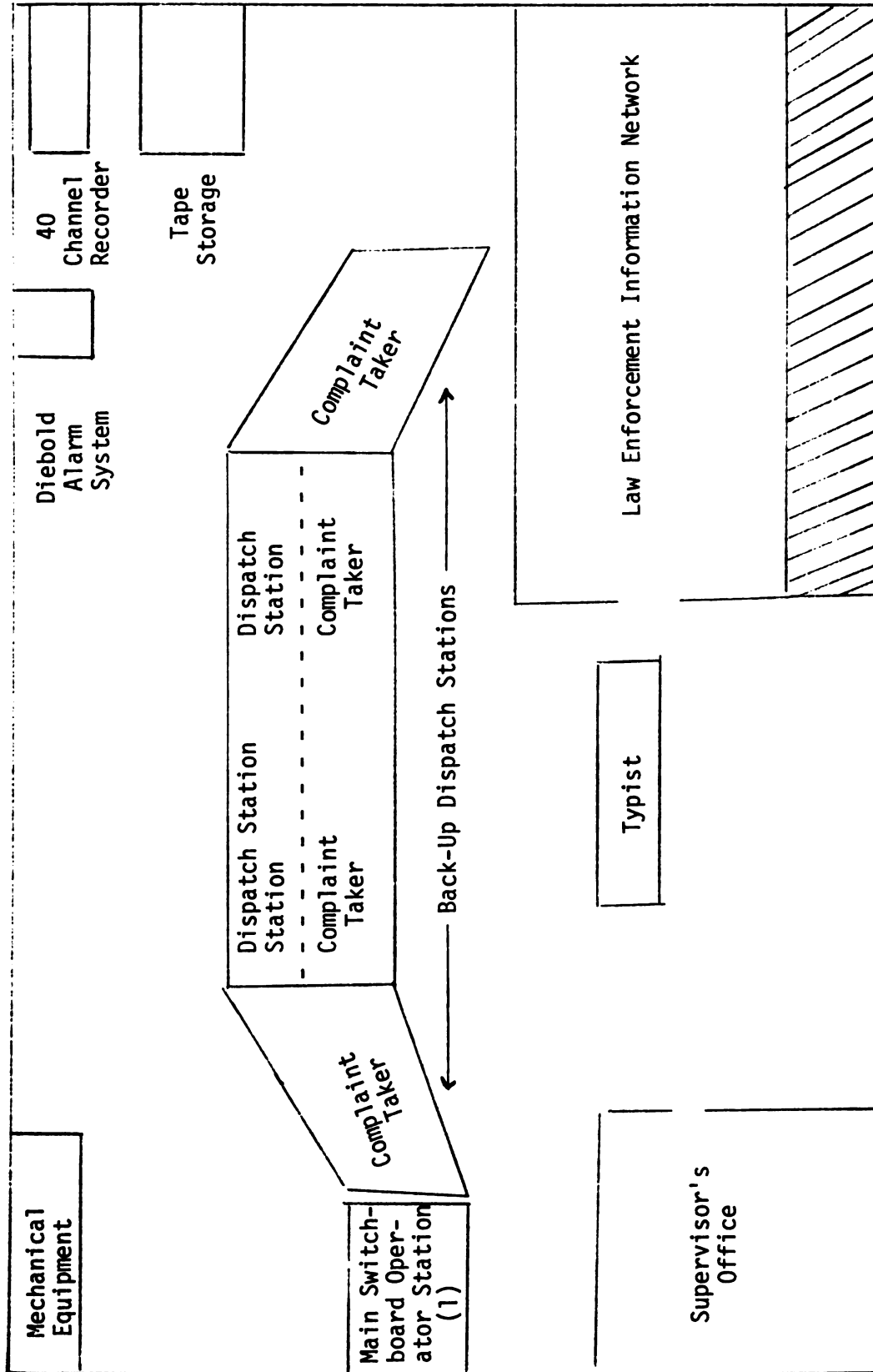
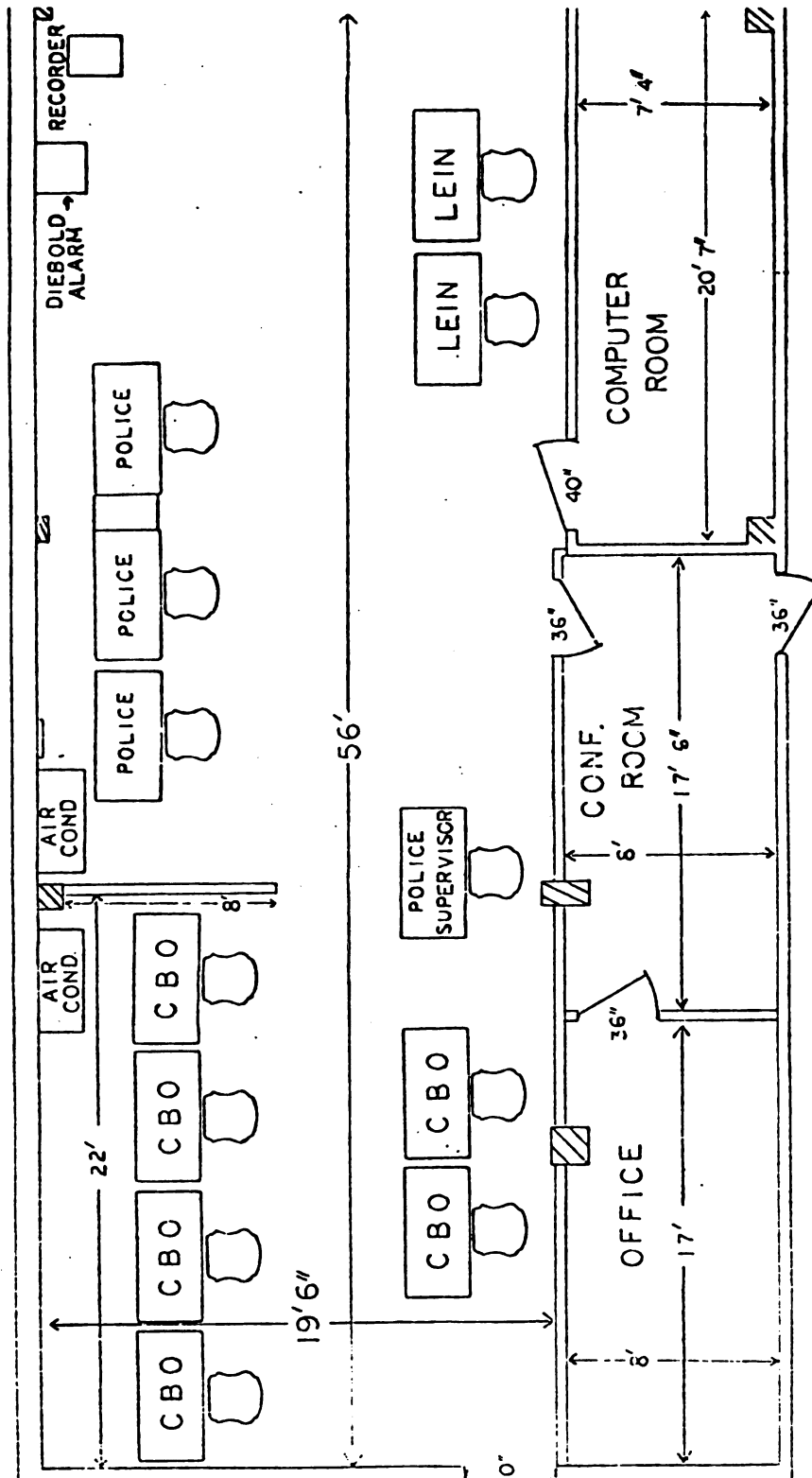


EXHIBIT S.--Existing Communications Center Layout.



(1) CENTRALIZED FIRE & AMBULANCE SERVICE/RECEIPT AT THE 911 COMMUNICATION CENTER
 (2) CENTRALIZED FIRE AND AMBULANCE DISPATCHING AT THE LANSING'S #1 FIRE STATION

EXHIBIT T.--Proposed 911 Communications Center Layout.

either in physical materials or layout. Phones ring directly adjacent to the dispatcher and there is no separation by function. Any verbal communication interferes with everyone operating in the center.

In the proposed E.O.C. there is designed a separation of function. This removes the noise of the phones away from the radio equipment. The computer will be segregated from the rest of the E.O.C. The supervisor will be in a position to monitor everyone in the center and have a private office in which to conduct business.

Other items not reflected in the drawing that will be included in the E.O.C. are non-static carpet, humidity control, accoustical wall coverings and a window. These are all items lacking in the existing facility and are designed to improve the human and physical considerations of the E.O.C. that will house the 911 Emergency Telephone System.

Evaluation of the System

Evaluation of the project will commence at the time the 911 Emergency System becomes operational. Because of the expected impact of the project (increased reporting of criminal activities and emergencies), initial preparation for evaluation will begin before the system's implementation. Statistical data will be acquired prior to project implementation. This data will be utilized for comparisons with data obtained during the project period. These statistics will be available from the Lansing Police Department's Administrative Services Division, where experienced personnel maintain and prepare complex statistical analysis.

The factors to be evaluated will consist of the following items.

1. Persons aware of 911 at implementation of the project and one year after.
2. Number of contact points between citizen and emergency services.
3. Increased public confidence with the 911 Emergency System as opposed to existing system.
4. Response time in answering calls for emergency services (by phone) under each system.
5. Number of instances that failsafe recording devices were utilized and under what circumstances.
6. Percent of change reflected in total number of calls for service.
7. Number of apprehensions attributed to the 911 Emergency Services System (i.e., arrest resulting from telephone complaint).
8. Success of the publicity campaign to be considered in conjunction with Number 1 above.

Reports and records on the factors to be evaluated will be generated and maintained on a monthly basis for evaluation purposes. This information will be collected through random sample surveys and tabulations made by the staff of the 911 Emergency Operations Center. These reports will also serve as guidelines for program emphasis and will be the tools to structure the flexibility built into the system.

The evaluations of the project will be used to determine what effect, if any, the 911 Emergency System had on the participating members, public or private.

The process of evaluation will be conducted by the Project Director and his staff. The proposed goals, and the objectives to

achieve these goals, require adequate feedback to determine the direction and impact of the project. Effective evaluation is the only reliable method of obtaining such information, and the above format will perform this operation. It will also assist in determining future goals and needs of the system after the completion of the original project period.

Summary

This chapter provides the basic design and development of the 911 Emergency Telephone System. The 911 E.T.S. is a subsystem of the Police System. It was developed through numerous hours of research, meetings, and discussions. Some of the organizations assisting the Lansing Police Department were:

- Michigan Bell Telephone
- Motorola Communications, Inc.
- City of Lansing Data Center
- Office of Criminal Justice Programs
- Tri-County Regional Planning Commission
- All Participating Agencies and
- Employees in the existing center

This list is not all inclusive, but it does begin to identify the vast amount of resources that were involved. Again, it must be stated that the 911 E.T.S. is directly related to the development of the Computer-Aided Dispatching System.

The C.A.D. development will begin in the next chapter and augment the design that occurred in this 911 Emergency Telephone System.

CHAPTER VI

DESIGN OF THE COMPUTER-AIDED DISPATCH
SYSTEM

Background Information

The Computer-Aided Dispatch System (CAD) became a necessity for two major reasons: first, it was a mandate that 911 systems and CAD systems had to be implemented simultaneously in order to receive any federal funding. Second, because this is a county-wide effort and the impact of a 911 E.T.S. is a projected 25 percent increase in calls for services, it becomes desirable to automate the dispatching function.

The goals related to the Computer-Aided Dispatching System were identified as follows.

1. Increase the efficiency, capability and safety of the emergency services field units.
2. To improve the operations of the emergency services communications center.
3. To improve the collection, storage and retrieval of information available to management on a county-wide as well as on an individual emergency service area basis.
4. To apply cost-effective measures to the consolidation and utilization of multi-governmental emergency service resources.

5. To improve the emergency services units response to the citizens' requests for assistance.

The goals of this system impact dispatching functions, field units, data management, consolidation of services and equipment and response times. Objectives were developed that can be identified with each particular goal. These objectives are as follows.

1. Improved Operational Effectiveness

- a. To properly select and train qualified personnel to effectively and efficiently operate a multi-community computer-aided dispatch system.
- b. To effectively interface a 911 emergency services number with a computer-aided dispatch system.
- c. To reduce the work load of the already overburdened radio dispatchers and increase their efficiency by creation of a quieter, less stressful working environment.
- d. To reduce the response time, as measured from the time of detection of the emergency to the time of arrival, of the emergency services units.
- e. To increase communication accuracy, reliability and speed.
- f. To immediately identify emergency situations, prioritize these calls and provide for prompt response of emergency services units.
- g. To provide better coordination between emergency services when multiple services are a necessity.

- h. To increase the apprehension rate significantly on calls for service where a fresh crime is reported. This is based upon the new capabilities of faster response.
- i. To reduce the redundancy of mundane clerical chores for operations and emergency services units personnel.

2. Improved Emergency Services Units Personnel Safety

- a. To provide follow up unit(s) with greater and more reliable information.
- b. To insure that unit personnel are better prepared for hazardous situations.
- c. To provide for the capability of handling tremendously increased radio traffic during riot or other disaster.
- d. To improve the safety of emergency services units personnel through constant status monitoring.
- e. To provide responding units more information about hazards (i.e., criminal records, structure contents, etc.) prior to arrival.

3. Improved Community Relations

- a. To increase citizen confidence and participation in the reporting of emergency circumstances to the emergency services units because of the touted emergency services units increased capabilities.
- b. To eliminate the multiple levels of duplication in the provision of emergency services in the areas of training, personnel, equipment and facilities.

- c. To cost effectively procure both capital, equipment and operating supplies through the larger scale of purchases created through multi-community combined operation.
- d. To provide management the capability, through data collection and analysis, information for proper resource allocation and manpower deployment.
- e. To establish lines of regular communications with other intra- and inter- departmental agencies to promote a coordinated effort of emergency services to the community.
- f. To construct and maintain a methodology concurrent with rigid standards, to accurately evaluate the success or failure of the project in meeting its goals.

The goals and objectives outline the function of the second link in the Police System. If viewed in a series of progressive steps, the initial gathering of data would come first. The majority of this data would be obtained through the 911 Emergency Telephone System. The second step would be the utilization of the data gathered. This is the function of the CAD system. The cost-effective, efficient interface of man and machine to process calls for emergency services through the utilization of gathered data.

Design Considerations

There are only three major considerations affecting the design of a CAD system. The first consideration is funding, second is

technology, and third is politics. To master all three of these considerations would result in the ability to design a near perfect system. A number of problems resulted from these obstacles. With regard to politics, this somewhat also affects the money obstacle. One must also consider that the Police System is multi-jurisdictional. This involves nine political entities. Each jurisdiction must agree on the services it receives, their cost to participate and their level of participation. All of these decisions are based upon the technology available to render the services.

Technology itself is an asset in considering the design of CAD. Unlike telephone technology, in the area of CAD systems the buyer (designer) can obtain generally any features desired. The major problem with the technology aspect is that only a few organizations manufacture CAD systems. This results in little competition, and soaring costs.

Each of the considerations discussed has included the mention of funding. The difficulty involved in obtaining funds are as follows. Nine separate political bodies must independently agree to fund their portion of the CAD system. The cost itself does not appear to be as offensive to the politicians as the fact that what they pay for will be housed in a jurisdiction other than their own, and not under their direct control.

A number of other considerations affected the design of the CAD system. These items are discussed in "Design Considerations," Chapter V.

Control of the CAD System

The discussions of funds, politics and federal grants lead to the problems of controlling such a system. It was decided that control would be established through a governing board. This board consists of a member from each of the participating agencies. Each agency that participates does so through a contractual agreement with the City of Lansing. This is because Lansing via the federal grants is actually responsible for the CAD system. Each of the participating agencies is allowed one vote and majority rules. It should be noted that members include the participating fire agencies. Two Ex-officio members have been appointed to ensure coordination of effort. The Ex-officio members are representatives from Michigan Bell Telephone and Lansing Emergency Operations (Civil Defense).

This governing board is titled the 911 Board of Control. The Board has appointed its own technical committees composed of members from the Board. By-laws have been drafted and adopted by the Board. The table of organization on the following page depicts the authority of the 911 Board of Control.

Design Analysis

In addition to the analysis performed in the design of the 911 E.T.S. with regard to staffing, the following steps were taken to assist in the design of the CAD system. Time studies were performed at the Lansing Police Department to determine the savings that would result by the elimination of certain manual tasks now performed by the switchboard operator, complaint taker and dispatcher. The estimated time savings is outlined below.

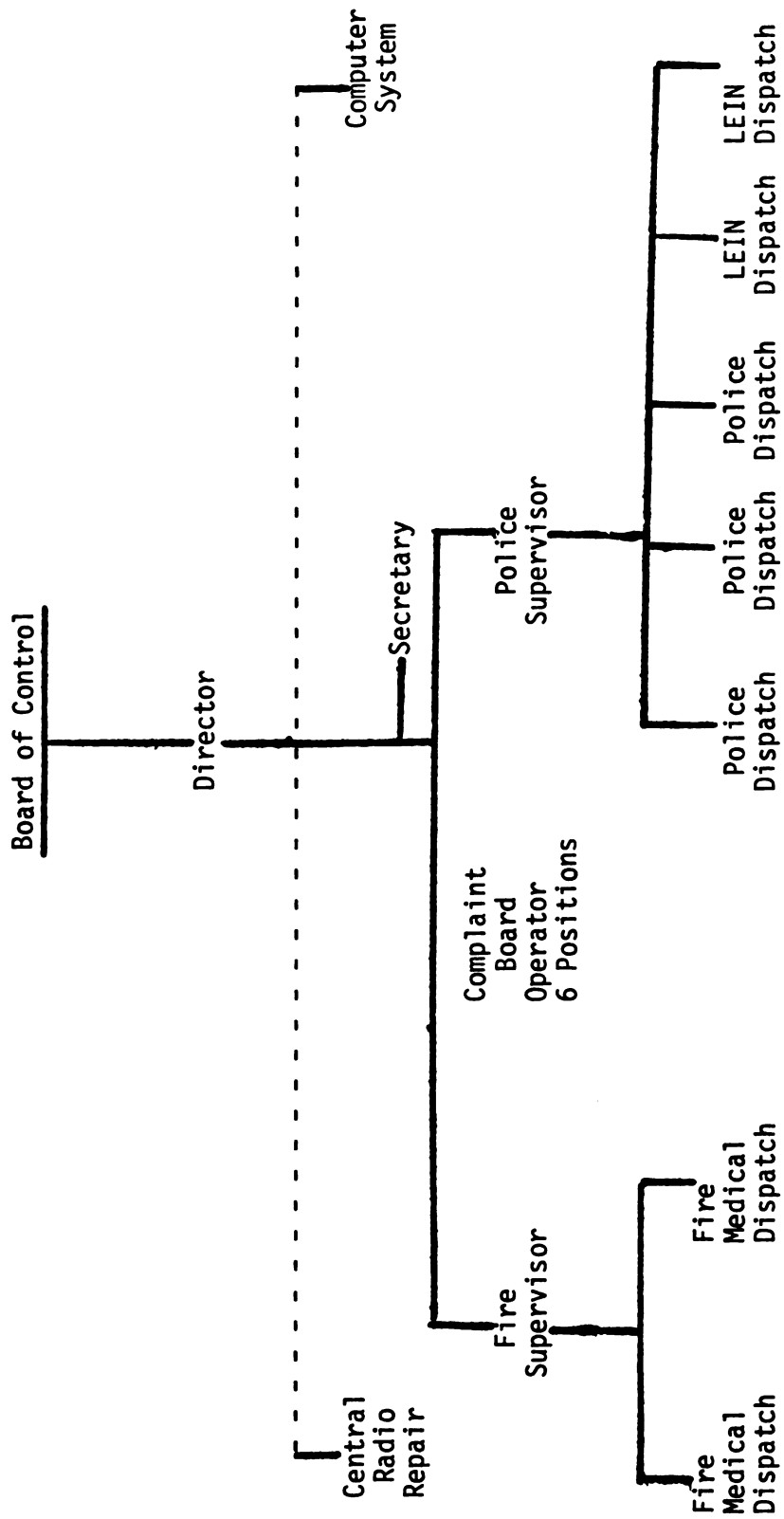


EXHIBIT U.---911 Emergency Operations Center Governing Structure.

Manual Tasks Eliminated by a Computer-Aided
Dispatch System
(Lansing Police Department)

	<u>Estimated Time Saved</u>
Four Manual Time Stamps.	18 Sec.
Switchboard Operator's Conversation is Eliminated. .	20 Sec.
Manual Transfer of Call from Switchboard	
Operator to Complaint Taker.	6 Sec.
Manual Recording of Reporting Area	10 Sec.
Recording Complaint Taker's ID Number.	4 Sec.
Mental Sorting of Calls on Priority Basis.	6 Sec.
Time Dispatchers need to Determine Which Unit	
Should be Sent	4 Sec.
Manual Recording of Field Officers' Badge Number . .	4 Sec.
Manual Recording of Unit Number.	4 Sec.
Manual Recording of Dispatchers' ID Number	4 Sec.
Total Time Saved Per Call.	80 Sec.

It is estimated that an average of one minute and twenty seconds can be saved per dispatched call by the computer-aided dispatching system's ability to eliminate the above listed manual tasks. This represents an improved ability to process calls at a faster rate.

Through the use of computers, an average response time was developed for nine categories of calls for service. A sample was drawn from the Police Dispatch System of the Lansing Police Department from (1-4-76 to 4-1-76). The results are on the following page.

It should be remembered that these are average response times. This is response time as measured from the time a call is received to the arrival of a field unit. As indicated by the previous manual task time studies, these response times could be significantly reduced.

Type of Incident	Number of Incidents	Average Response Time
Part I Crimes*	1,941	10 min.
Part II Crimes	465	10 min.
Calls for Service	14,337	9 min.
Specific Incidents		
Crime-In-Progress	237	3 min.
Armed Robbery	35	3 min.
Bank Alarms	93	2 min.
Other Alarms	692	3 min.
Prowler Complaint	203	5 min.
Firearms Incident	68	6 min.
Kid Complaint	423	11 min.
Animal Complaint	100	11 min.
Miscellaneous Incidents	376	8 min.

*Offenses which generally do not have suspects or the crime happened hours age.

The chart on the following page is an improvement upon the chart presented in Chapter IV (page 51). It presents the net time savings involved with use of a computer-aided dispatching system.

The analysis performed for the 911 ETS which involved the selection of the best method to receive calls also considered the CAD functions. In order to better understand the development of the CAD system, an analysis was performed to determine the basic functions of CAD systems around the country. The table on page 82 illustrates a partial list of the functions that are standard within a CAD system.

This table also reflects the most popular methods of CAD system operations. The first column indicates that the majority of

Function	Time Required With Manual System	Time Used by Computer-Aided Dispatch System	Net Time Saving
I. EFFICIENCIES GENERATED IN DISPATCHING PROCESS (Based on Projected 151,000 calls for service)			
Record Response Time	18 sec. per call (755 man-hours/year)	Automatic--No time required	755 man-hours/year
Enter File Number	4 sec. per call (167.8 man-hours/year)	Automatic--No time required	167.8 man-hours/year
Type Radio Log	20 sec. per call (838.9 man-hours/year)	Automatic--No time required	828.9 man-hours/year
Record Status by Time	4.2 sec. per status (704.6 man-hours/year)	Automatic--No time required	704.6 man-hours/year
TOTAL MAN HOURS SAVED IN DISPATCHING PROCESS			2,466.3 man-hours/year
II. EFFICIENCIES GENERATED IN COMPLAINT ENTRY PROCESS (Based on Projected 151,000 calls for service)			
Write complaint number (45,009 offenses)	4 sec. per call (50.1 man-hours/year)	Automatic--no time required	50.1 man-hours/year
Call sorting by area and priority	6 sec. per call (252.1 man-hours/year)	Sort time is 2 sec. (83.9 man-hours/year)	168.2 man-hours/year
Transfer Complaint to Dispatcher	6 sec. per call (252.1 man-hours/year)	Automatic--no time required	252.1 man-hours/year
TOTAL MAN HOURS SAVED IN COMPLAINT ENTRY PROCESS			470.4 man-hours/year
III. EFFICIENCIES GENERATED IN PATROL CARS (Based on Projected 151,000 calls for service)			
Write Dispatched Information	30 sec. per call (1,258 man-hours/year)	Eliminated--no time required	1,258 man-hours/year
TOTAL MAN HOURS SAVED IN PATROL CARS			1,258 man-hours/year
TOTAL MAN HOURS SAVED THROUGH UTILIZATION OF COMPUTER-AIDED DISPATCH SYSTEM			4,194.7 man-hours/year

EXHIBIT V.--Projected Work Load Reduction Represented in Man-Hours Saved.

Department	Receive Calls	Route to Other Agency	Take Info. for PD	Route to Dispatcher	Dispatch Call	Location Verification	Prior History File	Remote Queries
Huntington Beach ¹	ACDS ⁶	Call director	CB0 ⁶ +keyboard +CRT	Computer	Computer	Computer	Computer	Dispatcher
Seattle ²	ACDS	Call director	CB0 +keyboard +CRT	Computer	Voice	Computer (beat ID)	None	Dispatcher
San Diego ¹	ACDS	Call director	CB0 +keyboard +CRT	Computer	Voice	Computer (beat ID)	None	Info. op.
Palm Beach ²	Dispatcher	Dispatcher	Dispatcher +keyboard +CRT	Not Applicable	Voice + computer	None	None	Dispatcher
Toronto ³		Complaint operator	CB0 + cards	Conveyor	Voice	None	None	Dispatcher
Glendale ⁴	Dispatcher	Dispatcher	Dispatcher +keyboard +CRT	Not Applicable	Voice	None	None	Dispatcher
Las Vegas ²	ACDS	Call director	CB0 +keyboard +CRT	Computer	Voice + computer	Computer	None	Patrolman
Jacksonville ⁵	First avail CB0	Call director	CB0 +keyboard +CRT	Computer	Voice	None	None	Info. op.
Dallas ⁵	ACDS	Complaint operator	CB0 +keyboard +CRT	Computer + TTY	Voice	None	None	Dispatcher
Shreveport ³	ACDS	Complaint operator +CRT	CB0 +keyboard	Computer	Voice + computer	None	None	Dispatcher
New York City	ACDS	911 operator	CB0 +keyboard +CRT	Computer + Teletype-writer	Voice	None	None	Info. op.

¹Turnkey Systems by Motorola; ²Turnkey Systems by Kustom; ³Turnkey Systems by GE; ⁴Turnkey System by TRW; ⁵Systems designed and procured by municipal EDP departments; ⁶Legend: ACDS--Automatic call distribution system, CB0--Complaint board operator, CRT--display screen.

EXHIBIT W.--CAD Functional Requirements in Selected Police Departments, 1975.

agencies used the automatic call distributor to receive and direct incoming calls. As discussed in Chapter V, this option was not available to this area because of technology. The remaining areas represent decisions on functions to be included in the design of this system. One of the noticeable differences is in the category of remote queries. The majority of agencies have the dispatcher or a police officer process the remote data bank queries. In Chapter V, it was explained that in this system, the dispatchers' only function will be to dispatch. The reason for this is to allow concentration on the field units and reduce busy time of the dispatchers.

Having completed the basic data gathering and analysis, the next phase is the interface of the 911 Emergency Telephone System and the Computer-Aided Dispatch System. This interface also assists in determining the features to be incorporated within the CAD system.

A basic flow chart is presented on page 84. This reflects the basic system interfaces of the CAD system. This diagram illustrates that the CAD system is the center of an information network. All communications except for the voice link are processed through the computer. The interface between the 911 E.T.S. and CAD system begins to address the data collection, storage and retrieval functions of the CAD system.

CAD Functions

- Street-to-Beat File. The computer matches the incident address to the appropriate police or fire district, which results in a reduced response time.

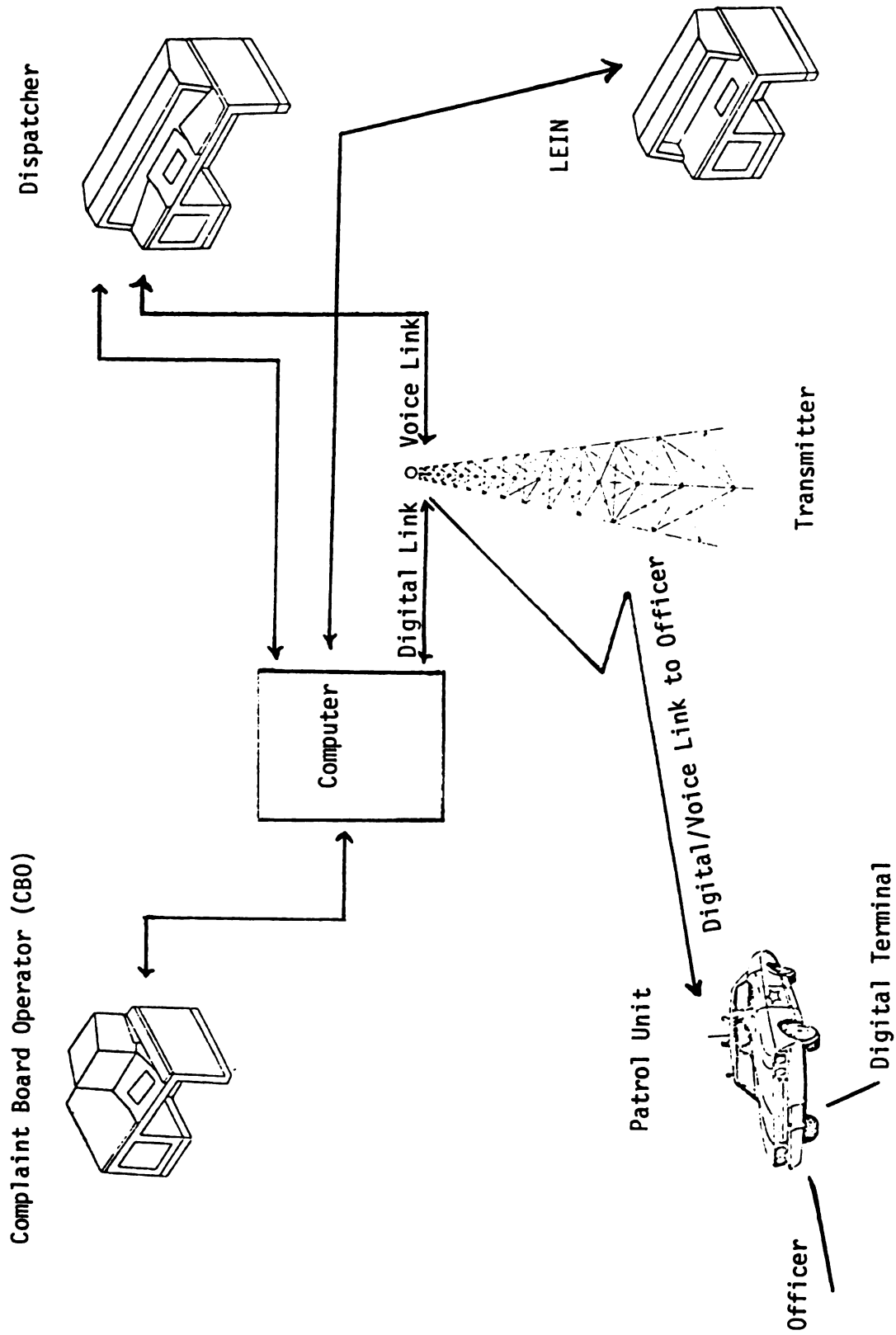


EXHIBIT X.--Communications System Functional Block Diagram.

- Hazardous Address File. The computer checks the incident address against this file to determine if any previous acts of violence have occurred there. If there is a record, the dispatcher is automatically notified.

- Address Verification File. The computer will search a geographic base file and verify the existence of the incident address.

- Police Unit Recommendation File. The computer will identify and recommend to the dispatcher one or more units that are available to service a call.

- Fire Run Card File. This automates the existing manual card file. The dispatcher is notified by the computer of what units normally respond to the particular alarm.

- Automatic Unit Status Display. This involves the Mobile Digital Radio System (Chapter VII). The majority of field voice radio transmissions involving status changes are transmitted digitally. This reduces frequency congestion and busy time of the dispatcher and field unit.

- Automatic Time and Date Stamping. All times normally recorded manually are automatically recorded and logged. This feature provides accuracy of records.

- Instant Information Transfer. The incoming incident when released by the CBO is automatically transferred to the dispatcher of the appropriate jurisdiction.

- Continuous Display of Highest Priority Unassigned Incident Summaries. The computer is programmed to display incidents of the

highest priority by time received. This eliminates the continual manual restacking and prioritizing of calls.

- Instant Recall of Complaints. Any position within the center can call up any incident in full detail for review.

- Review of All Incident Summaries. The ability to call up all incidents and screen and review those assigned or unassigned. This allows a supervisor to determine workloads, backlogs, etc.

- Complaint/Dispatch Formats. The use of standard complaint and dispatch formats on the Cathode Ray Tube (CRT) Screen. This provides for accurate, and complete information on each incident.

- Incident Record Logging. As each active incident is resolved a complete record of the incidents including all status changes is recorded on a printer. This information can also be transferred to magnetic tape. The existing key punch system is eliminated and accuracy increased.

The functions outlined in this section will increase the safety and efficiency of the field units and the operations of the Emergency Operations Center. This will occur because of the increased amount of reliable accurate data. With the data maintained and utilized in the above functions, the special features of the CAD system were then developed. These features include those determined to be the best of the systems reviewed, and new features specifically developed for this system.

CAD Features

1. A summary of calls informing all complaint board operators of previous incoming calls. This effectively eliminates duplication of previous calls.
2. Address matching is automatically performed thus eliminating erroneous dispatches and entries.
3. Unit status change capability to add to, remove from, or rearrange units will be provided.
4. Inquiry capabilities of status of unit, unit activity, active incidents, unassigned incidents, shift roster, impounded cars and ambulance transport runs.
5. Provide extensive data editing and formatting features.
6. Computer will alert dispatcher when personnel are out for too long a period of time.
7. The supervisory Cathode Ray Tube/Keyboard will have a master override capability of all dispatching functions.
8. System will be equipped for automatic start-up in case of a power failure.
9. Any Cathode Ray Tube Terminal in communications center can be used for recall and update.
10. System will generate reports for individual agencies or complete statistical summaries for the entire 911 agencies.
11. System will generate time information.
12. Area and unit responsibility per dispatcher will be assigned per shift.

13. All unit and officer activity will be recorded and be available for requested reports.

14. In an emergency the complaint board operator will have the ability to transmit partial information to the radio dispatcher while the operator is acquiring further information.

15. System will provide for off-line report generation.

16. Uniform Crime Report numbers will be entered by update clerks and Uniform Crime Reports computer generated from this data.

17. Case clearance data will be entered via update clerks and reports computer generated.

18. System design will include and interface with LEIN, NCIC and SOS remote data base files.

19. An ambulance transport file will maintain a list of the last 100 persons transported (on-line).

20. System design will include an Impounded Car File, capable of maintaining 100 on-line records.

21. The Supervisor's Alert feature will notify the supervisor when the number of priority one calls reaches a specified level of backlog.

22. The system also is designed to include a shift roster which will display on the CRT all police units and the officers assigned to each.

23. A "free text page" has been included in the dispatchers and CBO's programs to allow comments to be included in the incident record.

The flow chart on the following page diagrams the route information will take when received by a CBO. It also reflects the various records that will be recorded. One of the key factors involved in the design and selection of functions and features was management information.

CAD/Management Information

One of the primary requirements of 911 ETS-CAD System as subsystems of the Police System is to provide for the automation of data gathering within the communications function. Data is required on all dispatch activity. Original calls for service must be able to be updated with additional data, without redundant data entry. Also, the original incident record must be available for verification, editing and correction. All data transactions must be captured and preserved for management reports. The minimum statistical summaries available can be queried by: (1) call code; (2) complaint number; (3) unit; (4) officer; (5) area; (6) agency; and (7) the center as a whole for any time span. The following types of reports will be available:

1. actual numbers,
2. percentages;
3. ranking;
4. actual change,
5. percent of change (for geographic area, time of day, and/or day of week),
6. application of the data to Uniform Crime Reports, and
7. correlations between all of the above.

All of the above data will be available on-line for retrieval during the previous 24-hour period.

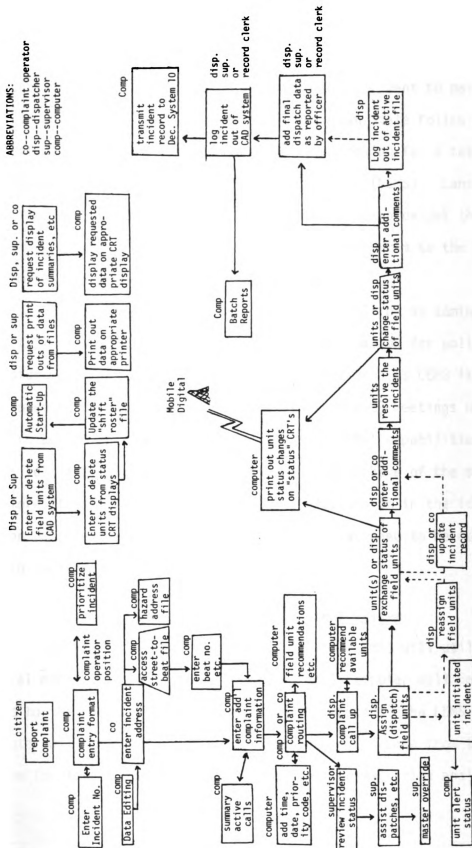


EXHIBIT Y.--Police Department Computer and Dispatch System.

As the design of the CAD system was nearing completion and the manipulation and utilization of data was under development, the opportunity arose for the Lansing Police Department to participate in yet another grant program. The Michigan State Police and the Office of Criminal Justice Programs were looking for a test site to implement a Law Enforcement Management System (LEMS). Lansing qualified and was awarded this grant. This system provides the necessary interface of a management information system to the CAD system to provide management reporting data.

The Law Enforcement Management System will be an administrative tool. It will provide the necessary information for police and decision making at all levels of the organization. As LEMS is developed it is anticipated that regular (frequent) meetings will be held to advise the various administrators of LEMS' capabilities. It is felt that the more direct knowledge people have of the system, the more it will be utilized. This will also assist in the identification of necessary changes or new concepts that need to be made within the system.

CAD/Law Enforcement Management System

The Law Enforcement Management System (LEMS) will utilize a central mini-computer system. This LEMS mini-computer will be interfaced to the computer-aided dispatch mini-computer. The LEMS mini-computer will then begin the central collection of data from the CAD system for later data utilization in uniform crime, crime analysis

and management reporting. As the System expands, components will be added to the LEMS computer, as well as all interfaced computer systems.

The Law Enforcement Management System has considered the following problems.

1. Data Management for crime analysis has been at best minimal and of no value for decision makers.
2. Existing data management systems have procedurally increased the paper flow rather than reducing it.
3. Complex software design to date was not flexible enough to provide the response times needed by management.
4. The cost of an individual jurisdiction attempting to maintain such a system has traditionally been prohibitive.

The LEMS system has been designed to resolve these problems in the following fashion.

1. Establishment of a unique Management Information System data base tailored for the Police System. Management and crime data needed for analysis purposes has been identified by members of the Department's Crime Analysis Unit. This data added to operational data will formulate a new data base which will be used by the LEMS System.
2. One system design criteria was to eliminate redundancy and manual manipulation of data. The LEMS data collection scheme will begin the planned reduction of paper flow by automating the dispatch and records portion of the System. A forms control program was developed and will be used to centralize common data needs within the department and reduce the redundancy of data collection.

The dissemination of data throughout the entire department will be via CRT Terminals.

3. The software selection to be implemented with LEMS will be a data base Management System designed for flexibility. The data base system is a complete set of software tools for consolidating the Police System's individual data files into a single data base, so all information is accessible to those who need it.

4. Mini-Computer Systems are more cost effective than main frame computer systems. With the advent of mini-computer technology, the cost of computer systems has decreased.

Components of LEMS will include:

1. Computer-Aided Dispatch model,
2. Uniform Crime Reporting Model,
3. Crime Analysis Model,
4. Incident, Person, Crime and Vehicle Indexing Model,
5. Resource Allocation Model (Hypercube, PCAM),
6. Arrest and booking model,
7. Crime and Case Correlation and Accounting Model,
8. Budget/Payroll Model,
9. Evidence/Property Control Model, and
10. Personnel Activity Model.

The Law Enforcement Management System will interface with the following remote data banks:

1. Law Enforcement Information Network (LEIN),
2. Secretary of State (SOS)
3. National Crime Information Center (NCIC), and
4. Automated Law Enforcement Communication System (ALECS).

The LEMS as a subsystem of the Police System will also interface with all local Criminal Justice agencies that share common data element needs. This interface would involve the Courts, Prosecutors and Corrections.

Computers, the means of storing, retrieving, analyzing and sharing data require further discussion with regard to their role in the CAD and Police System.

CAD/911 ETS/LEMS and Computers

The functions of the above systems are controlled by the programming of mini-computers. This provides cost-effective, flexible, on-line systems that can function in-house with few environmental controls required. The larger main-frame computers of a generation ago were less flexible in their programs, the majority of them required extensive environmental controls and were very expensive. The result was governments purchased a single computer that was shared-time and multi-function. Law Enforcement usually took a back seat in the access to these systems.

The availability of mini-computers allows police agencies to purchase their own hardware and have it programmed to their specific needs. This provided for in-house on-line systems at a cost Law Enforcement could assume.

Mini-computers have the following capabilities:

1. Sophisticated data base management system.
2. Large virtual memory capability.
3. Large main memory capacity.
4. Wide range of computer languages (including COBOL and RPG II for business applications and FORTRAN for scientific use) and software utilities. Programming languages can be mixed without restriction.
5. Ability to run very large programs.
6. Ability to handle a large number of users simultaneously.¹

¹Frederick W. Miller, "The Impending Merger of Minis and Mainframes," Infosystems, April, 1978, p. 45.

These are also the capabilities of the large mainframe computers. Thus the best of both worlds is attained. The capability of a large mainframe functioning through a computer that requires little space in comparison. The final advantage of the mini-computer is that it can be programmed in more than one language.

Utilization of the computers with properly trained personnel will have a tremendous impact on the Police System and the Justice System in total.

CAD and Its Impact on Other Systems

Computer-Aided Dispatching is the core of the Police System. It provides support data to the 911 CBO positions and the dispatchers' positions. Through programming the accuracy, type and amount of data is increased and standardized.

Inter-agency communications are improved. Consolidation of equipment and services is attained. Response times will be reduced because of the centralized location and automated information available.

Efficiency of the E.O.C. operation will increase, as will that of field units. The speed and accuracy of communications to the E.O.C. from the public, within the E.O.C., and between field units and the E.O.C. will be improved significantly. Records established through data stored in the CAD/LEMS will be standardized. Information and management reports will become available to the smaller participating agencies that previously had manual records, if any.

A CAD interface with other Justice Systems programs will provide the capabilities to track persons, cases, workloads and property. Because of the many functions surrounding the Computer-Aided Dispatching System, the aspect of evaluation will be a difficult process.

Computer-Aided Dispatching/Evaluation

The evaluation phase of this project is particularly significant because of the potential impact which computer-aided dispatch communications systems can have on future police communications. Evaluation of this system will, therefore, provide the direction and guidance on the utility of the approach not only for the law enforcement agencies of the area, but for all emergency services agencies throughout the state. For this reason, a very detailed and comprehensive evaluation is planned.

The evaluation process specifically analyzes the areas listed below.

1. Establish the utility and efficiency of the computer-aided dispatch system.
2. Determine the overall gain in communications efficiency realized as a result of the computer-aided dispatch equipment.
3. Clearly identify the advantages and disadvantages of this approach.
4. Determine what effects the system has on the emergency service potential of the emergency services units.

5. Identify special areas of application.
6. Determine what effects the system has on the overall management of emergency services resources.
7. Evaluate the system cost in relation to the benefits derived.

Parameters to evaluate the systems performance are as follows.

1. Does the system perform as the selected vendor claims?
2. Is LEIN access time reduced?
3. Does the dispatcher workload decrease?
4. Is frequency congestion reduced?
5. Cost of the system to operate as opposed to the existing systems.
6. Maintenance Considerations:
 - a. downtime
 - b. costs
 - c. availability of service personnel and parts
7. Reliability of the system.
8. Compatability with human interactions.
9. The type and need of training to operate the system.

Five sources of input have been identified to obtain data for the evaluation.

1. The citizens of the community.
2. The emergency services units.
3. The communications personnel.
4. The command personnel.
5. The participating emergency services agencies.

Basically, a before and after evaluation will be undertaken. The before and after situations will be ascertained using questionnaires, personal interviews, surveys of operations, and measurement techniques. The questions will address themselves to the evaluation parameters mentioned earlier. The evaluation tests will be used periodically to monitor the evolutionary response of police department personnel to the system, as well as to measure the improvements and effects on efficiency on the overall command and control centers.

This data will be used in both a subjective and objective review of the system. The subjective review is important because of the extremely complex system which is being evaluated. The objective review will consist of a standard statistical evaluation of the survey data.

Based upon the results of this evaluation, recommendations and guidance concerning the application and utility of the computer-aided dispatch communications system equipment will be prepared. It is anticipated that the program results will be beneficial to many of the emergency services agencies throughout the state.

Specific evaluations will be undertaken to determine if the five stated goals for the Computer-Aided Dispatch System have been attained. These evaluations will occur as follows.

- Goal 1 (increased efficiency, capability and safety).

Statistical data for this section shall be obtained from reports/ records on assaults and injuries to emergency services personnel, as well as losses incurred through crime and fire. These statistics

shall be compared to a similar time period under the present system of manual dispatch.

- Goal 2 (improved E.O.C. operations). Statistics and data for this section will be derived from comparisons of data presently collected on queuing times, response times, LEIN queries, etc., and will be compared with similar data obtained after implementation of the Computer-Aided Dispatch System. Specifically, the test period results under computer-aided dispatch will be compared to a similar time period under present manual procedures during which there was an equal work load of calls to be answered. This is to ensure that similar data is compared.

The success or failure of the project to significantly reduce queuing delays and response times and to increase LEIN queries will then be quantitatively measured based upon this comparison.

- Goal 3 (improved data management). The success or failure of the project to attain this goal will be determined by the project's ability to produce for management information on the time of day, day of week and geographic called for emergency services. This information will not only be available with respect to each individual participating emergency services agency, but will be available on an aggregate county-wide basis.

- Goal 4 (cost effective consolidation). The success or failure of the project to accomplish this goal will be derived from budget costs before and after consolidation, reduction of personnel costs county-wide and equipment maintenance costs reduced county-wide.

- Goal 5 (improve emergency unit responses). To measure public feeling, a random sample of residents will be conducted by telephone. The interviewer will ask a structured list of questions designed to elicit the feelings of the public without influencing the answer. From these samplings, the total population feeling will be projected by statistical probability methods. The procedure will be structured to measure attitude change as perceived by the individual. This procedure will include a pre-computer-aided dispatch and post-computer-aided dispatch sampling and a comparison of the two.

It is important to distinguish between true evaluations of the communication system and evaluation based on factors not under the control of this project. For example, calls cannot be dispatched unless cars are available; therefore, statistics such as "average time to dispatch a run" should be considered as an evaluation of the new communications system only when communications is the limiting factor.

Summary of CAD

The Computer-Aided Dispatching System will be established by the Lansing Police Department, in conjunction with a multi-community 911 centralized dispatch center, to demonstrate the effectiveness of automated multi-community 911 Computer-Aided Dispatch System as a new and innovate dispatching technique in a medium sized city and county.

The automated multi-community 911 Computer-Aided Dispatch System will improve response to calls for service with the net

benefit being crime reduction, higher apprehension rates of criminals, a reduction in loss of lives and property, and an increased feeling of personal security for the residents of the City of Lansing and County of Ingham.

A final component of the information gathering portion of the Police System is the Mobile Digital Radio System which is explained in the following chapter.

CHAPTER VII

DESIGNING THE MOBILE DIGITAL RADIO SYSTEM

Background

The necessity for the Mobile Digital Radio System is created by the implementation of the centralized 911 Emergency Telephone System and the Computer-Aided Dispatching System.

Currently, dispatchers manually record all unit activity in order to provide unit status, unit safety and management data. Within the proposed centralized communications center there will be an increased volume of calls for service processed by a decreased number of dispatch positions. This will result in an increased dispatcher work load and a 60 percent increase in dispatcher unit responsibility.

During 1975, Ingham County Law Enforcement Agencies responded to 151,615 calls for emergency services. The 1976 statistics demonstrated a 10 percent increase in the rate of calls. This increase, coupled with the projected 25 percent increase associated with 911 would raise the projected number of calls for police service to 204,680 or an estimated 561 calls for service per day.

Given the problems stated above, the following specific goals were identified for the Mobile Digital Radio System.

1. Increase the efficiency, capability and safety of the emergency services field units;

2. To reduce frequency utilization;
3. Increase and speed, accuracy and reliability of transmitted data; and
4. To reduce the work load of the radio dispatcher and increase their efficiency.

Five main objectives were developed to assist in attaining the stated goals.

1. To provide for the automatic recording of status changes and to create a quieter, less stressful working environment.
2. Eliminate misinterpretations of messages and/or status changes.
3. Replace time-consuming voice transmissions with tone coded data.
4. Provide constant unit status monitoring.
5. To reduce patrol frequency utilization rate by 10 percent.

Data Analysis

The Mobile Digital Radio System became necessary as the analysis for the Computer-Aided Dispatch System was undertaken. Surveys conducted nationally in 1976 indicated that ". . . 47 percent of all radio is status/messages, consuming 18 percent of the total air time."¹ In conjunction with this, as was outlined in Chapter IV,

¹Jet Propulsion Laboratory, Application of Computer-Aided Dispatch in Law Enforcement, California Institute of Technology, March 31, 1976.

the Lansing Police Department's main radio frequency is exceeding the recommended 50 percent utilization rate.

Analysis from the CAD system determined that the following benefits would result from the implementation of the Mobile Digital Radio System.

1. Improved utilization of field personnel because of reduced involvement with radio equipment.
2. Improved utilization of dispatching personnel by increasing the volume of transmitted data that one individual can process.
3. Privacy of police communications, i.e., status and identity of field units.
4. Automatic identification of transmitting field units.
5. Field unit personnel can immediately inform the dispatcher that they have an emergency situation without having to wait for a clear frequency.
6. Ability of the dispatcher to alert field units of an emergency call.
7. Ability of the dispatcher to initiate a call command to a selected vehicle.
8. Ability of the dispatcher to send a digital interrogate command to a selected vehicle.
9. System capability to operate simultaneously on three radio channels.
10. System capability to provide a separate acknowledgement indicator for each status/message push button.

Design Considerations

Three basic problems were the major considerations in the design. These problems were present throughout the entire project area (Ingham County).

1. Lack of standardized status reporting.

2. Lack of standardized real-time recording of status information.
3. Inability to efficiently capture management information regarding patrol man-hours to be utilized for resource allocation.

The implementation of the Mobile Digital Radio System addresses each of these considerations. Two other factors that were to be considered were the type of vehicles to be equipped and the messages that the digital equipment would send. These issues were answered in the design stage.

System Design

Exhibit Y, page 90, illustrates how the Mobile Digital Radio System will interface with the CAD computer and the dispatcher. As mentioned throughout Chapter VI, frequency congestion and dispatcher busy time are prime considerations in the effective operation of these systems. Equipping the primary vehicles interacting with the CAD system with digital equipment, and programming the digital units with the most frequently used messages will significantly reduce radio air time.

The data gathered in Chapter IV demonstrated the number of vehicles each police agency had. Thus it was determined that only vehicles from the Uniform Divisions would be equipped. They are the majority in number and the primary users. Equipping the Uniform Division vehicles of each department will reduce the manual tasks to be performed by the dispatchers recording status changes, and reduce the time of the field units waiting for air time to transmit a status

change. Also reduced will be busy time of the dispatcher and the frequency congestion. The installation of the digital units will be as follows:

Agency	Status Unit Allocation
Lansing	40
East Lansing	7
Lansing Township	3
Ingham County Sheriff	15
Meridian Township	5
Delhi Township	3
Stockbridge	2
Leslie	2
Mason	2
Webberville	1
Sub Total	80
Spare Status Units	4
TOTAL REQUIRED STATUS UNITS	84

The mobile digital equipment in the vehicle will transmit a variety of five messages and eight status changes. Messages and status changes selected to be used in this system are listed below.

Messages

1. Out of Service
2. In Service
3. Enroute to the scene
4. Arrived at the scene
5. Report(s) for review

Status Changes

1. Acknowledge transmission
2. Need assistance
3. Motorist Assist/Escort
4. Accident report
5. Traffic stop
6. Transport prisoner
7. Traffic control
8. Attempt pick-up

The messages and status changes selected were determined through surveys administered to dispatchers at the Lansing Police

Department and officers that interact with dispatchers. They were asked to identify what information they felt could best be handled through the digital equipment. The interface of the digital equipment to the CAD system produces a number of beneficial features.

Mobile Digital Radio System Features

1. Status/messages transmissions required only $\frac{1}{4}$ of a second.
2. Digital equipment has 99 percent reliability of accurate information transfer.
3. The dispatcher is appraised of the elapsed time a unit has been in a status.
4. The digital equipment verifies the message received and notifies the field unit the message is accepted.
5. All messages sent by the digital equipment are identified so the dispatcher knows which unit is transmitting.
6. Digital equipment will transmit a message a specified number of times; if the message is not received, the digital unit will indicate to the field officer that the message must be re-sent.
7. Digital equipment is compatible with the existing voice equipment, thus requiring no major modifications.
8. The dispatcher has the status of all units under his control displayed at all times.
9. Digital equipment prevents the monitoring of calls by the general public as is possible with voice communications.
10. Digital equipment will be equipped with an "Emergency" alarm. When a field unit pushes this button, an audible and visual alarm will notify the dispatcher of the danger.

These features have been identified as being the most beneficial to the CAD and Police System. The method to determine will be through evaluation.

Mobile Radio Digital System Evaluation

Evaluation of the Mobile Digital Radio System will commence at the time the system becomes operational. Because of the projected impact of the system, initial preparation for evaluation will begin prior to implementation. Statistical data will be acquired to allow for comparison with data obtained during the system's operation.

Specific factors to be evaluated are listed below.

1. Frequency utilization under the Unit Status Data System compared to the existing system.
2. "Busy time" of the dispatcher(s) under each system.
3. Error rate of collected dispatch data under the current manual system as compared to the Unit Status Data System.
4. Emergency situations brought to the attention of the dispatcher by use of the Unit Status Data System.
5. Noise level in the dispatch center resulting from radio traffic compared under each system.

Reports and records on the factors to be evaluated will be generated and maintained on a monthly basis for evaluation purposes. This information will be collected through random sample surveys and tabulations. The evaluation of the Mobile Digital Radio System will be utilized to determine its affect on the radio communications network.

Mobile Digital Radio System Impact

The Mobile Digital Radio System is designed to impact in the following three major areas.

1. Frequency congestion.
2. Dispatcher work load.
3. Accuracy of reported information.

All of these areas revolve around the element of data. With the digital system more data will be transmitted in less time, with greater accuracy and less manual tasks. This will improve the collection, storage, retrieval and use of records, which is the next topic of development.

CHAPTER VIII

DESIGN OF THE COMPUTERIZED RECORDS SYSTEM

Background Information

The development of computerized records occurred essentially at the same time the Computer-Aided Dispatch (CAD) System was designed. Records were necessary to provide management with the information to make decisions. This information has to be available on a timely basis. Also, it is necessary to have the capability to determine intrerelationships within the data gathered. Thus the CAD system itself generated the development of computerized records with regard to the areas identified in Chapter VI (workload related data).

The Law Enforcement Management System (LEMS) generated the development of computerized files. The continuing development of the LEMS is the basis for the Computerized Records System, which is interfaced to the Computer-Aided Dispatch System.

Goals for the Computerized Records System are as follows.

1. Eliminate the redundancy and manual manipulation of data.
2. The consolidation of files into a single data base, accessible as needed on a county-wide as well as individual agency basis.
3. Increase the speed, accuracy and reliability of the records maintained.

4. Increase the ability to store, retrieve, and manipulate data.
5. To provide management the capability through data collection and analysis, information for evaluation and decision making.

In light of the stated goals a number of objectives can be identified.

1. Reduce the paper flow.
2. Standardize record keeping throughout the county.
3. To interface with other local justice information systems.
4. To eliminate the multiple levels of duplication in areas of records, personnel and equipment.
5. To provide for the expansion to a tri-county level.

The above goals and objectives outline the direction of the Computerized Records System.

System Design

The system design actually revolved around two independent stages of development. The Law Enforcement Management System (Chapter VI) was under development by the Michigan State Police. Also, the Lansing Police Department was in the process of developing its own computerized records system to suit its needs. As these two projects were merged, the Computerized Records System evolved.

The LEMS concept envisioned three major categories, each with sub categories. These were identified as follows:

<u>Management</u>	<u>Regulatory</u>	<u>Services</u>
Fiscal	Investigations	Registrations
Property Control	Juveniles	Inspections
Resource Allocation	Traffic	Elderly
Case Control	Inspections	
Officer Performance		
Jail Management		

Two additional areas were identified as major categories by the Lansing Police Department: Crime Analysis and 911 ETS/CAD Support Data.

The tables on the following three pages illustrate the major file categories, sub categories and identifies some specific files to be maintained.

Development of the data to be gathered for the Computerized Records System resulted from an indepth analysis of the divisions utilizing data from the Records Sections of the Police Department. Appendix D contains a table that lists the various forms, reports and types of data that will be necessary in the Computerized Records System.

The interrelationship of data is one of the most important facets of the Computerized Records System. Each division requires the ability to perform specific data analyses. The necessary data is fairly standardized with each division attempting different analyses. Appendix D contains the interrelationships that were identified as necessary by each of the divisions at the Lansing Police Department.

These interrelationships were selected through interviews with the personnel in each division that work with the information to be

Table 1.--Computerized Records, Management.

Fiscal
Current Year's Budget Status (Now) Next Year's Projection
Property Control
Vehicle Maintenance Building Inventory Property Inventory Equipment Inventory
Resource Allocation
Department Resources Resources by Division Resources outside available
Case Control
Current Status/Number of Cases Manhours Dispositions
Officer Performance
Workload Sick Time Investigative Time Quality of Work Data (Case Tracking) Activity by Category Overtime Court Time
Jail Management
Prisoner Flow (log) Prisoner Property Control Meals Special Treatment Visitor Records

Table 2.--Computerized Records, Regulatory.

Investigation
M.O. Files Suspect Files Offender Files Alias Files Vehicle Files Fingerprint Files Victim Files Pawn Files Diversion File Stolen Property/Vehicles Mug Files Reference
Juvenile
Contact File Diversion File Criminal History File (Local)
Traffic
Violations Issued by Type Accidents by Type Parking Violations Issued Injuries/Deaths
Inspections/Permits
Liquor Licenses Vehicles Weapons Permits Commercial Drivers' License Permits

Table 3.--Computerized Records, Services.

Registrations
Weapons Bicycles Property Vehicles
Property Inspections
Public Commercial Private
Citizens
Elderly Deaf Blind Sick

Table 4.--Computerized Records, 911 Emergency Telephone System/CAD.

Support Data
Incident Log Radio Log Street Index Intersection File Common Place Numbers Public Telephone Numbers Hazardous Address File Personnel Roster Ambulance Transport Impounded Car File
Crime Analysis
Categories Under Investigation Categories Under 911 ETS/CAD Juvenile Contacts Weapon Registrations

used. From these interviews, new ideas were obtained about additional information to be gathered and existing data that it currently serves no purpose to collect.

In addition to the ability to interrelate data, it is important to be able to retrieve data. Because of programming limitations of the existing system, the ability to query data is restricted. An example of the problem would be an attempt to query stolen televisions during a given month. The system contains the information, but it is only retrievable on a case by case basis, and the operator must have the case numbers. The proposed Computerized Records System will eliminate this type of problem.

System Reliability

The accuracy, speed and reliability of this system will far exceed that of the existing Lansing Area Law Enforcement System (LALES). Within the computerized system will be positions to perform the verify and edit functions. As information from case reports is entered into the system, the same information will be entered into the system by a second clerk, the system will notify the second clerk of an inconsistency. Editing would then occur to correct any error and the information would then be entered into the system.

Reliability of the system will also result from the fact that the mini-computers have consistently demonstrated significantly less than 5 percent downtime. Also, the computer will belong to the Police Department. This eliminates the time-sharing factor and delays in having programs run.

Two Computer Programmers and a Systems Analyst will be employed by the City of Lansing (Police). This will eliminate having to share programmers with other City Departments. These positions will spend full time serving the needs of law enforcement.

The chart presented in Chapter VI, page 90, illustrates the various methods by which information will be channeled into the Computerized Records System. The majority of records data will be obtained from the 911 Emergency Telephone System, Computer-Aided Dispatch System and Mobile Digital Radio System. Other information will be received by walk-in traffic requesting weapons permits, commercial drivers license permits and other documents that require a personal appearance. Also, data will be gathered from the Detention function and Quarter Master (property storage) functions.

Computerized Records--Impact

The total impact of the Computerized Records System can not be assessed at this point in time. The reason for this is that its potential has not been fully developed or recognized. As law enforcement changes, so will the need for data and the types of information to be gathered. Thus a continuing on-going analysis will have to be undertaken to ensure that the system is meeting the needs of law enforcement and the public it serves.

Again, it must be interjected that the Computerized Records System is a subsystem of the Police System. The immediate impact of the Computerized Records System on the Police System will occur in the following ways. First, records will be available to assist in

the evaluation of the other subsystems previously discussed. The records used for these evaluations will be more accurate and available on-line as opposed to the existing system, where errors may occur at any of several steps without being noticed or corrected.

Second, records data will be available on-line. There will not be the existing five day (or more) wait to obtain information stored. Third, is the amount and types of data that will be available. The information is taken from the shaded areas of the reports. There are a total of eight different report forms in Appendix D. LALES provides no correlation capability. Appendix D outlines the types of data to be stored, retrieved and interrelationships to be made. The vast difference in capabilities is an impact that will take some time to assess, as it will take users time to fully realize the system's capabilities.

Fourth, the system will reduce the paper flow, thus reducing the physical need for file cabinets and space. Fifth, and one of the most significant, will be the standardization of data maintained throughout the county and having it located at a single centralized data base.

The final impact will be that of providing managers throughout Ingham County's Law Enforcement Agencies the ability to have data on which to make decisions. Data they can obtain without delay, that is accurate, current and reliable. The ways in which this can assist law enforcement are numerous. Information can be obtained for budget purposes, resource allocation, crime analysis, crime prevention, and areas as yet not identified. The Computerized Records System will

allow law enforcement and the community to take a look at what is happening.

Evaluation of the System

In many instances evaluation of the Computerized Records System will occur as the evaluation of the other subsystems occur. This is because a number of the goals of this system are also goals of the other subsystems.

Specifically to be measured will be the downtime of this system as compared to vendor claims. User satisfaction of information obtained from this system as opposed to the existing system. This will encompass ease of access to information and the need for the expanded amount of data available.

Another important factor will be the amount the users actually use the system. Having all of the new capabilities will serve no purpose if the system is not used. The cost of this system as opposed to the cost of all the other systems throughout the county will have to be compared and considered in light of the above factors. Finally, the ability to interface with other Criminal Justice Information Systems will be a factor in the evaluation.

The Computerized Records System is the last subsystem of the Police System to be discussed. The interface of all these subsystems will create an information system unparalleled today. The next step is the discussion of the Police System which occurs in the following chapter.

CHAPTER IX

THE POLICE SYSTEM

Overview

The nucleus of the capability provided by the Police System involves the accurate capture, organization and distribution of information. This will contribute to the increased effectiveness and efficiency of Law Enforcement.

The Police System will function off two mini-computers and associated peripheral equipment, which will include radio dispatching gear, telephone instruments, Cathode Ray Tube (CRT) terminals and printers. One of the mini-computers will be dedicated to the dispatching function and interface to the CBO's and dispatchers CRT terminals. The diagram in Chapter VI, page 90, outlines this computer's functions.

A second mini-computer will be devoted to the records function (LEMS) and serve as a back-up to the computer-aided dispatching function, should that mini-computer be down. Describing the Police System in more simple terms--it will be an information system, designed to serve the law enforcement community. The scope of the Police System addresses the total law enforcement system as is outlined in the goals that follow.

Goals of the Police System

As each of the subsystems of the Police System were discussed and outlined, goals were identified. From those goals a series of ultimate goals have been developed for the Police System.

1. The ultimate goal of any system of this type in the field of criminal justice is to discourage criminal activity and thereby reduce the loss of life and property.
2. To develop a model system that is transferable to similarly structured Law Enforcement Agencies.
3. To provide for an orderly growth and expansion with minimum difficulty and the eventual capability of a pencil-free operation.
4. To provide for the consolidation of data at the county level into a single data base that will be cost effective and efficient.

System Design

The chart on the following page illustrates the inter-relationships of the various subsystems of the Police System. The chart reflects that the Computerized Records System is actually a portion of the LEMS. Three distinct divisions of the Police System are identified: Data Input, Communications, and Data Collection.

Under Data Collection is a function identified as the Field Reporting System. This consists of the investigative reports submitted by officers. These reports are presented in Appendix D. A second function not previously discussed is the non-emergency telephone system.

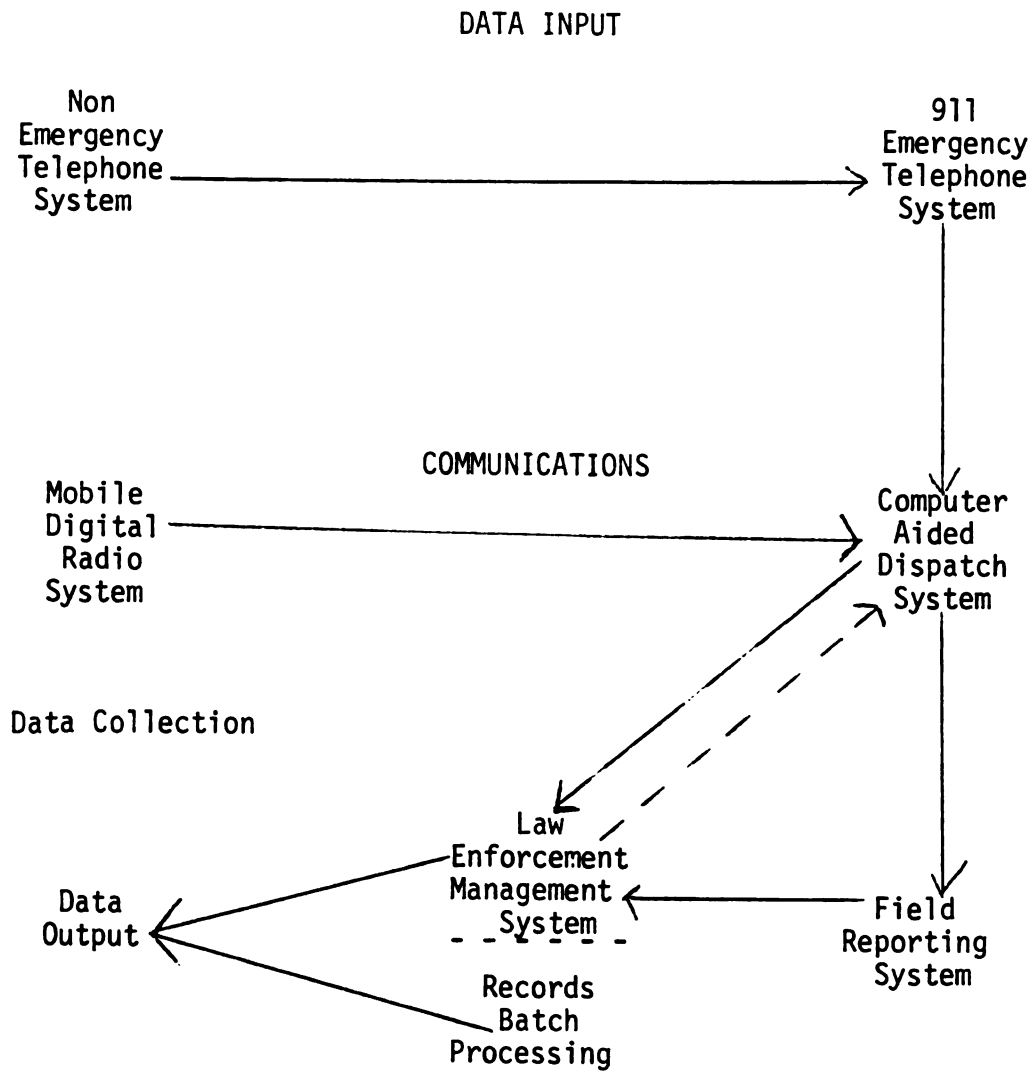


EXHIBIT Z.--The Police System.

Data Input is not restricted to only the 911 Emergency Telephone System. Non-emergency calls for service will also be answered by the complaint board operators. Calls of a non-emergency nature being placed via the regular seven digit number will be concentrated on one side of the CBO console. Non-emergency calls for service will be answered after 911 calls for service. Considerable data is obtained from the non-emergency calls for service, thus this is an integral part of the Police System.

System Design--The People

In the development of each subsystem, the human factors were only briefly mentioned. It is important that this subject not be overlooked. This chapter is the most appropriate location for the discussion as it affects the design of the Police System. The success of the Police System depends upon a favorable interaction with people, both those within the confines of the Police Building and those people working the street. Exhibit AA illustrates the groups of people that were involved in the system design.

It is important to note that the design was user oriented. The design work forces and the users are at the top of the table. The solid lines represent formal lines of communications and the broken lines are informal paths of communication. The critical factor here is that all input was received by the Administrative Services Division of the Lansing Police Department. That is where the actual system designs occurred.

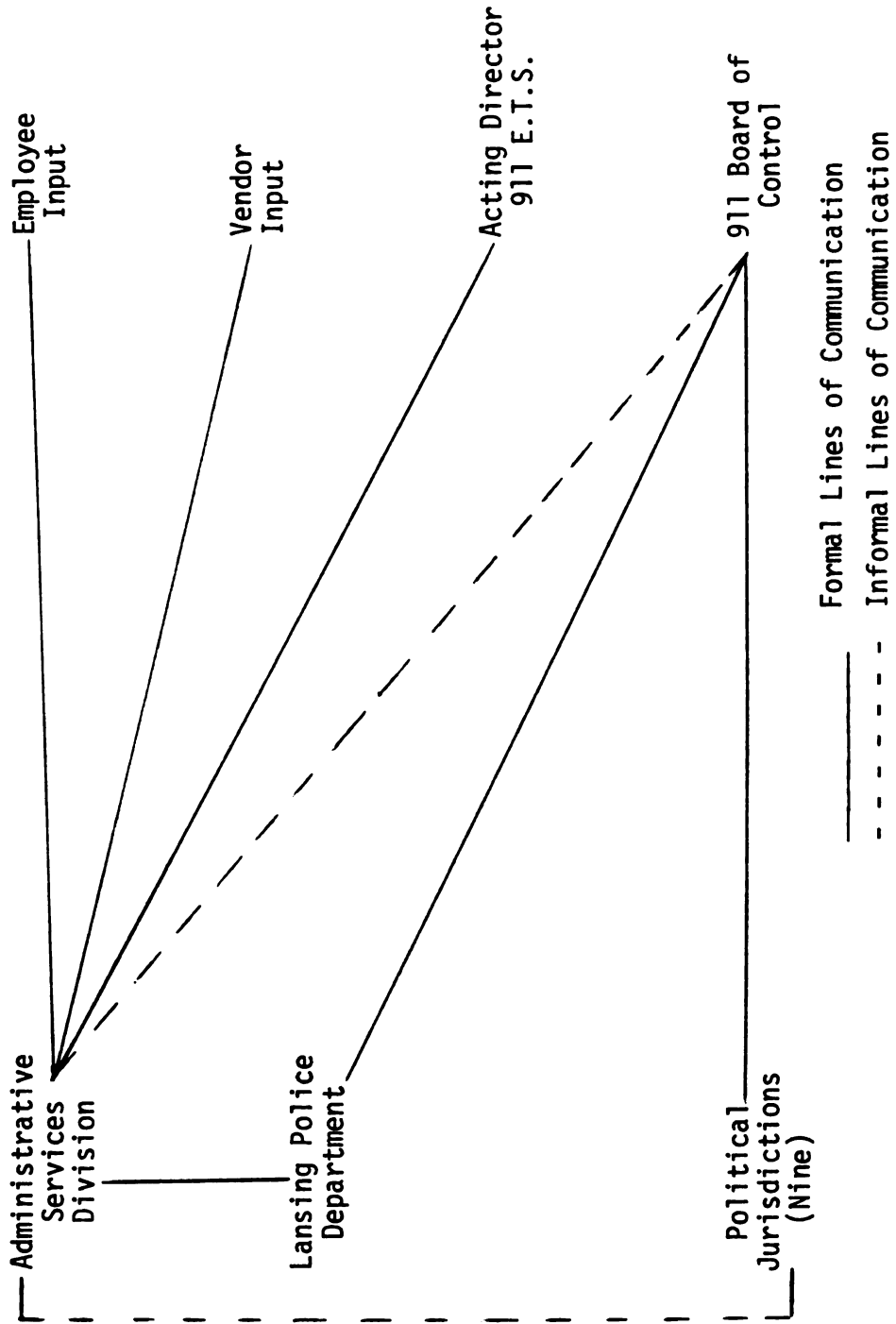


EXHIBIT AA.---System Design--The People.

Without the detailed input from the sources listed, the system would not be user oriented. Input from the employees was obtained through a series of meetings preceded by a notice of the topics of discussion. At these meetings the concept of the subsystems were explained, the need for input emphasized and the floor opened for discussion. By including the users in the actual planning many ideas were obtained in the areas of (1) physical environment; (2) job description; (3) morale; and (4) task performance. Untold hours were spent in conferences with the dispatchers, operators, and supervisors. They were assured that their specific input and support was necessary to the success of the system. Even representatives of the Fraternal Order of Police (employee bargaining unit) were included in meetings to keep them abreast of upcoming changes. By including those affected through the implementation of the Police System, rumors, fear and antagonism were reduced and support was gained through understanding and participation.

Vendor input into the Police System was critical in a number of ways. First, by directing their input to the Administrative Services Division and then having this information forwarded to management, the fear of outsiders not understanding the problem was eliminated.

Second, input obtained from the employees can then be fed back to the vendor for modifications in the system design or functions. Third, the vendor is reporting to the user's designer and not a committee. Thus there is no mid-direction of communication, authority or responsibility with regard to decisions, contracts and agreements.

The same ideas are applicable to the nine political jurisdictions involved. All inquiries are answered by the 911 Board of Control and they obtain their information from the Administrative Services Division of the Lansing Police Department. In the majority of instances, inquiries would be referred directly to that division. Representatives would then attend meetings, make presentations, answer questions and execute contract agreements.

User orientation as opposed to management orientation was the thrust of including the various people in the planning stages. Management will definitely benefit from the system, but the greatest gains will be by the users and the community.

Police System Costs

Implementation costs of the Police System continued to be a factor from the dates planning began. The table on the following page (Exhibit BB) reflects the costs of the system from August, 1975 through January, 1978.

The August, 1975 budget was developed by the 911 Implementation Committee composed of:

Chairman: Councilman Terry J. McKane (Lansing City Council)

Members: Mayor Gerald W. Graves, Lansing
Frank Fitzgerald, Lansing Township
Frank Guerriero, Ingham County
Grady Porter, Ingham County
Chief Carl Barratt, Lansing Fire Department
Chief Thomas O'Toole, Lansing Police Department
James Holcomb, Director of Emergency Operations
Charles Reifsnyder, Lansing Police Department

The increased cost to the City of Lansing of \$53,000 between August, 1975 and March, 1977 was due to:

Lansing's FY 1975-76 Budget	Proposed 911 August 1975 Manual System	Proposed 911 March 1977	Proposed 911 June 1977	Proposed 911 January 1978 Computerized System	Percent Increase 1975-1978	Dollar Increase 1975-1978
Lansing Share \$733,949	\$831,336	\$ 884,100	\$ 875,978	\$ 920,390	10.7%	\$ 89,054*
911 Agencies Share -----	892,581	1,069,982	1,045,789	1,067,594	19.6%	175,013
Total 911 System Cost (Including Federal Monies)	892,581	1,221,741	1,281,057	1,801,138	102.0%	908,557

*Summary: Lansing's January, 1978 share of the 911 System has increased by *89,054 since August, 1975. The reasons for this increase are:

1. Inflationary Personnel Cost \$41,280
2. Development of a Fire Operating Budget
and Purchase of a Fire CAD Module 25,007
3. Development of a Police Operating Budget
representing inflationary cost from 1975 22,767
\$89,054

EXHIBIT BB.---Implementation Expenses.

Expansion of the 20 Channel Tape Recording System,
 Addition of an Emergency Message Recording System,
 Expansion of the Communication Center,
 Additional Expense for Telephone Engineering.

The increased cost for the total system of \$329,160 during
 the same period was due to:

Increase of Personnel (no cost to Lansing)
 Expansion of 20 Channel Tape Recording System
 Addition of an Emergency Message Recording System
 Expansion of the Communication Center
 Additional Expense for Telephone Engineering
 Development of a Geographic Base File for Ingham County

The increased cost to the City of Lansing of \$44,000 between
 June, 1977 and January, 1978 was due to:

Grant match for the Unit Status Data System
 Addition of the Fire Computer-Aided Dispatch System
 Additional expense of the Police Computer-Aided Dispatch System
 Award of the Law Enforcement Management System Grant

The increased cost for the total system of \$520,000 during
 the same period was due to:

Additional expense of the Police Computer-Aided Dispatch System
 Award of the Law Enforcement Management System Grant
 Award of the Unit Status Data System Grant
 Addition of the Fire Computer-Aided Dispatch System

Cost increases are reflected in the continued expansion of
 the functions of the Police System.

Police System Functions and Features

The functions and features of the Police System are represented in Exhibit Z, page 122. The major functions are: data input; communications (method of servicing calls); and, data collection. Under these functions are listed the features of the Police System. Each function addresses specific needs of Law Enforcement.

Data input will improve the communications between the community and law enforcement. This will present a situation where increased amounts of data are received and the data is of a better quality than under the previous system.

Communications or the method of servicing incoming calls increases the efficiency of the majority of law enforcement resources. It further increases the effectiveness of the dispatching operation by accommodating large numbers of personnel and equipment. The communications function allows for the consolidation of resources, both human and equipment, and creates an interface between other systems, departments, and agencies. Each of the other functions interacts with the communications portion of the Police System.

The last function of the system is that of Data Collection. This function provides support data to management, the communications function and individual departments, agencies, divisions or persons. Data output from this function will be a critical factor in evaluating the success of the Police System.

Evaluation

Total system evaluation will rest in part on the success and evaluation of each of the subsystems. Should the design of any of

the subsystems be deficient, the Police System would also experience a problem area. However, the advantages of the Police System operation may outweigh the deficiency in one of the subsystems.

Specific evaluations will be undertaken as follows:

1. Cost analysis of the Police System operation compared to the costs of operating the independent systems.
2. Comparison of overall crime rates and workload analysis.
3. Analysis of the evaluations of each of the subsystems.
4. Interviews with users that interact with the Police System to determine attitudes regarding support for the system, ability to use system, and the problems encountered.
5. Perform an analysis of the system configuration based on the above evaluations and recommend any necessary changes in design or expansion.

As previously mentioned, the success of the Police System will be dependent upon the design and operation of each of the subsystems. Each subsystem will impact one or more subsystem(s), the Police System and other Criminal Justice Systems. These impacts are the topic of discussion in Chapter X.

CHAPTER X

IMPACT OF THE POLICE SYSTEM ON THE CRIMINAL JUSTICE SYSTEM(S)

Overview

The impact of the Police System will be recognized at three levels: local, state and national. At the local level in the following ways:

1. Federal funds to subsidize upgrading of local police command and control systems are easier to obtain for such joint or cooperative systems. It would be difficult for small departments to obtain such funds as an individual applicant.
2. Significant savings can be made in operating costs, most particularly in personnel costs by consolidating into a centralized system.
3. Savings in procurement of both capital equipment and implementation costs will result because one system is being designed and put into operation, not one for each individual jurisdiction.
4. Radio channel crowding is especially troublesome in the case of several adjacent but separate radio dispatch systems. An integrated CAD-Mobile Digital Radio System will relieve this congestion.
5. Standardization of procedures, equipment and records.
6. Consolidation of files, records and equipment.
7. A closer community--law enforcement relationship.

The Police System will also increase the cooperation and coordination of police agencies throughout the county. They will retain their jurisdictional independence, yet be closely integrated with regard to information and communications personnel and equipment.

Within the state, the impact of the Police System will occur as it is recognized as a model system that can be transferred to other law enforcement agencies of a similar structure. There is little doubt that technological advances, such as computer-assisted dispatching, will become standard practice in law enforcement in the coming years. Existing computer-assisted dispatch systems have demonstrated that new technology can be beneficial and can be obtained on a cost effective basis. It also provides the basis for expansion into other technologies, such as mobile digital communications and computerized record systems. Once this regional police data is established, other criminal justice agency data bases will be interfaced to establish a fully automated Criminal Justice Information System.

Law Enforcement Agencies are an integral part of the total Criminal Justice System. Normally, the other segments of the Criminal Justice System, the prosecutor, courts and corrections, are dependent upon Law Enforcement Agencies to initiate activity requiring their involvement. Because of the close-knit relationship of all segments of the Criminal Justice System, it is important that all segments of the system function efficiently and effectively. Failure of any segment to do so will affect the performance of all segments, hence the public's confidence in the Criminal Justice System will be undermined.

It is imperative that systems like the Police System be developed to maintain law enforcement abreast of the times it operates within. As stated in the Criminal Justice Goals and Standards for the State of Michigan, Chapter 5, Communications:

Our law enforcement agencies cannot serve our public as they deserve without the adequate coordination of communication systems. Communications cannot exist and operate effectively without maximum productive usage of its critical component parts--the telephone system, command and control operation, and radio communications.

The Police System's impact at the national level will be in fulfilling the recommended standards and goals set forth for law enforcement by the National Advisory Commission for Standards and Goals (1973). The Police System will fulfill the recommendations, state and national, regarding law enforcement in the areas of telephone and radio equipment, computerized records and information systems. This will assist in the development of an overall Criminal Justice Information System.

Police System and the Courts and Prosecutors

The Police System will impact the development of both the Prosecutor and Court Systems. These latter two systems are a phase two development. Memory from the LEMS computer of the Police System will be utilized to develop and test the software for the Prosecutor and Court System. These systems are now in the developmental stages with a projected implementation date of late 1979.

As the testing of the Prosecutor and Court Systems software is completed, they will acquire their own mini-computers. The final

results will be a series of systems that are interfaced to provide a complete case history. This will provide for tracking of cases, people, property and criminal history information. The interface of all systems in Criminal Justice will result in a Criminal Justice Information System.

CHAPTER XI

RECOMMENDATIONS AND CONCLUSIONS

The Police System has not yet been implemented, which restricts the areas in which recommendations and conclusions can be drawn. The majority of recommendations focus on the steps involved in conducting the actual research and system design.

Recommendations

The first recommendation identified was that experienced professional people be employed to perform the following functions: (1) research and planning; (2) systems analyst; (3) budgeting; (4) purchasing; and (5) technical people. The proposed Police System was developed by police personnel who through self education had to familiarize themselves with the above five functions. If professional people were hired to fill these positions they could act in the capacity of an advisory board to the 911 Board of Control. Utilizing professional people would reduce the amount of preparatory time required in before system design can begin.

A second recommendation involves people and false assumptions. During the design of the Police System, explanations of the subsystems were presented to the 911 Board of Control. It was assumed that these individuals understood the facts and would be able to

accurately convey this information to their respective political bodies and respond to questions. This was not always the case and the results were detrimental in the progress of system design and obtaining support for funding. To remedy this problem, it is recommended that regular meetings be held between each jurisdiction's legislative body, 911 Board of Control member, and the System's Planner(s). This approach would ensure that each participating jurisdiction (funding source) completely understands it's involvement in the system.

The final recommendation concerning personnel is to establish and fill the position of the 911 Director at the beginning of the project. As planning for the Police System continued, the position was occupied by an "Acting Director" who was not actively involved in the system design. Thus the responsibility for the system was actually with the Lansing Police Department's staff, while technically the decision making power rested with the Acting Director of the 911 System.

Establishing a permanent Director's position at the onset of planning would clearly delineate the location of responsibility, authority and accountability. Another important factor is that it would create an atmosphere of impartiality. The Director is employed by 911 Board of Control. Thus, claims of loyalty to a particular agency or political body could be avoided. This is an important consideration when working with the smaller communities as they feel a sense of being consumed by the larger political bodies.

Three recommendations that encompass specifically the design aspect have been identified. First, the initial system design should encompass a much smaller physical area. The system should be implemented in a locality where the Department is totally committed to the philosophy of the system and spending the dollars to design and implement a successful system. The system's design should then include the capability to easily expand to a higher degree of participation.

Initially, starting at a small scale eases the political tensions and threats of jurisdictional takeovers. The funding is less complicated and the amount of coordination required is reduced.

The second recommendation with regard to system design is that a feasibility study be conducted at the conclusion of the design phase and prior to any implementation phases. This will ensure that the system as designed will function in the project area intended. The feasibility study should examine the total scope of the system's operation throughout each of the participating jurisdictions.

In this manner, people independent of the system design and impartial to it's success or failure can determine if the project is ready for implementation or requires additional planning stages.

The final design recommendation is that an amount of funds sufficient to allow on-site visitations be earmarked. It is felt that to view the actual operation of existing systems and interview the users, supervisors and managers provides a wealth of information not contained in the literature. These visits demonstrate how the system is actually used or circumvented. People's reactions to the

system can be obtained and their ideas to improve the system. On-site visitations should be a very important step in the planning process of any future system.

One of the most difficult problems in implementation of the Police System was to obtain and maintain support for funding. It is recommended that at the onset of the decision to implement a system, funding sources be identified. The method of funding should be established and commitments to participate obtained at the beginning of the project.

This was mentioned in another recommendation: that it should be undertaken at a locality that is committed to spending the funds necessary to design and implement the system. Problems occurred in the design of the Police System where costs increased and participating jurisdictions would waiver in their support of the system. Many of these problems can be attributed to politics, thus it is important to know at the onset of the project who intends to participate and the extent of their loyalty with regard to funding.

Recommendations--Summary

Basically the recommendations address the planning and design efforts. They are intended to streamline the design process and reduce problems.

1. Hire experienced professional people to perform the work.
2. Conduct regular meetings between the system planners, each political jurisdiction's legislative body and that jurisdiction's representative on the 911 Board of Control.

3. At the start of the project employ a Director for the System.
4. Design and implement the system initially on a smaller scale.
5. Conduct a feasibility study at the completion of the design phase to determine if the system will function.
6. Provide sufficient funds for several on-site visitations to existing installations.
7. Identify funding sources at the onset of the project and obtain a commitment to participate.

There would undoubtedly have been additional recommendations had the system been operational at the time of this writing.

Conclusions

Few conclusions can be reached at this time because the system has not been implemented and tested. It is felt that the most successful effort to date has been the budgeting process. Costs have been held to a minimum because of stringent budgeting procedures and negotiations. The major increases in costs have occurred as a result of significantly expanding the function of the system and inflation. Even with the expanded functions, federal grant monies have been obtained to partially fund each subsystem of the Police System. Without these federal dollars none of the participating jurisdictions could afford to implement a system of this magnitude.

Close working relationships based on confidence and trust were established between the Lansing Police Department, Tri-County

Regional Planning Commission and the Office of Criminal Justice Programs. Due to this rapport and the developed expertise within the Lansing Police Department, funds were made available to sustain these projects.

It was also concluded that budgeting was one of the most time consuming efforts of the projects. Nine individual legislative bodies had to be kept advised of their costs to participate in the system. This involves hours of meetings and preparing budget justifications. Thus the fact that the Police System reached the implementation stage with sufficient funds is viewed as a very successful effort.

A second conclusion is that through very detailed planning and research a large number of post-implementation problems were avoided.

In a dissertation prepared by Clara E. Molina, "A Model of the Process of Adaptation to Computer Systems and Information Technology in Law Enforcement Organizations," (1977), a number of problems were identified in the research findings. Many of the problems identified in that writing were resolved in the design of the Police System through the continued involvement of users and management through the design phase of the system. Also, the on-site visitations that were made to (1) Huntington Beach, California; (2) Hamilton County, Ohio; (3) Grand Rapids, Michigan; (4) Detroit, Michigan; (5) Jackson, Michigan; and, (6) Genessee County, Michigan. These visits provided data from existing systems that allowed the potential problems to be resolved prior to implementation.

Summary

The Police System has been a successful effort to the point of implementation. It is likely that this system after implementation will become a model for use throughout the state and nation. From the development of the Police System, models will also be developed for the Prosecutors and the Courts.

The Police System is as complete a system as law enforcement technology today allows. With the advent of improved hardware and technology, the system will expand to include Automatic Vehicle Locators and in-vehicle terminal intensive research efforts.

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APPENDICES

APPENDIX A

DATA COLLECTION AND PLANNING METHODS

Data Collection and Planning Methods

The contents of this appendix outline the most significant data obtained from the Jet Propulsion Laboratory publications.

Identified are:

1. necessary data to be gathered and
2. formulas for use in planning.

A detailed list of the data gathering and analysis steps is included. These steps were prepared from the readings of the Jet Propulsion Laboratory Publications.

Formulas*

Complaint Board Operators	= $\frac{\text{mean service peak call rate-time in seconds}}{\text{seconds/hours}}$
Delay	= $\frac{\text{mean waiting time in seconds}}{\text{mean operator service time in seconds}}$
Number of Dispatchers	= $\frac{\text{caseload}}{\text{cases per dispatcher}}$
Trunk Workload	= $\frac{\text{peak call rate/hr x duration (sec.)}}{\text{seconds per hours}}$

The answers obtained through these formulas are then applied to standardized tables presented in Jet Propulsion Laboratory Publications to determine the number of radio channels, trunklines and operators necessary. Also, to determine the probability of delay.

*Source: Multi-Community Command and Control Systems in Law Enforcement, Jet Propulsion Laboratory, 1976.

Detailed List of Data Gathering and
Analysis

Overall

1. Each proposed subsystem will be reviewed in light of systems that are in operation by reviewing their written procedures, flow charts and methods of operation. This will provide extensive information on programs from which to begin development of the systems.

2. Review recent publications, evaluations and research documents.

3. Review National and State Criminal Justice Goals and Standards.

A. 911 Emergency Telephone System

- (1) Determine the number of contact points between the caller and a police agency under each system.
- (2) Determine the length of time before an incoming call is answered (queuing delay).
- (3) Personnel required under each system (existing and proposed).
- (4) Equipment required under each system (existing and proposed).
- (5) Determine complaint processing time under each system.
- (6) Determine the ability to improve data collection and accuracy.
- (7) Determine existing and future needs for:

- (a) telephone communications for dispatching and inter/intra agency communications and
- (b) the ability to interface with other systems.

B. Computer-Aided Dispatching (CAD)

- (1) The efficiency of numerous independent dispatch centers as opposed to centralized CAD.
- (2) The ability to interface with other criminal justice information systems, both inter and intra agency.
- (3) The dispatch information to be collected and the method to do so under each system.
- (4) Determine existing and future needs of data collection for resource management and organization administrators.

C. Radio Frequency Communications--Digital

- (1) Frequency utilization
- (2) Efficiency
- (3) Dispatcher workload
- (4) Existing and future needs of data collection for resource management and organization administrators.
- (5) Ability to interface with computer-aided dispatching programs and equipment.
- (6) Compare existing and proposed information processing systems.

D. Records--Computerized

- (1) Offenses filed per year within the county.
- (2) Legality surrounding the length of time, accessibility and method of storage of records.
- (3) Records maintained and reports generated.
- (4) Efficiency.
- (5) Equipment required.
- (6) Determine existing and future needs with regard to collection, storage and retrieval of data.
- (7) Determine data necessary for resource management and organization administrators.
- (8) Data necessary for crime analysis functions.

Survey Information

Obtain representative data from the agencies involved in the following categories:

1. Number of personnel and their assignments;
2. Number of vehicles;
3. Area served by agency;
4. Population served by agency;
5. Number of calls for service;
6. Number of computer queries;
7. Number of administrative messages;
8. Number and type of radios;
9. Number of radio channels assigned;
10. Complaint entry procedures; and,
11. Data processing procedures.

Research the state-of-the-art with regard to computers in the following areas:

1. Mainframe vs. mini-computers, advantages and disadvantages;
2. Hardware available;
3. Computer capabilities;
4. Programming advancements;
5. Costs, mainframe vs. mini.

Motorola Mobile Data Workshop
Pre-Assignment Survey Form

The following survey has been utilized by Motorola Communications, Inc. Their personnel gathered necessary data for the planning of a system. This form was provided to the Lansing Police Department and adopted (see Appendix B) for use in this region. This survey provided a medium through which data could be gathered in the design of the Police System.

Minor modifications in the survey were made to include data necessary for this specific planning effort. Information regarding the purchasing of equipment was deleted as this information had already been obtained.

MOBILE DATA WORKSHOP PRE-ASSIGNMENT SURVEY FORM

Name: _____ Title: _____

R.C.R.#: _____ Dept: _____

Immediate Supervisor: _____

Customer: _____

Population Served: _____

1. GENERAL INFORMATION

NUMBER OF PERSONNEL

	Midnight	Day	Evening	TOTAL
Uniformed				
Investigative				
Complaint				
Dispatchers				
Records				
Administrative				
TOTAL				

Source: Motorola Communications Inc. (1976).

NUMBER OF CALLS FOR SERVICE

	1973		1974		1975
	Received	Dispatched	Received	Dispatched	Estimate
Day					
Evening					
Midnight					

	1973	1974	1975
Number of Vehicles	_____	_____	_____
Number of Mobile Radios	_____	_____	_____
Number of Portables	_____	_____	_____

Percentage of Motorola Equipment _____ %

If other, specify _____

NUMBER OF RADIO CHANNELS

	UHF	VHF	Low Band
Uniformed			
Investigative			
Other			

2. OPERATIONS

Describe Complaint Entry Procedure(s):

Describe Dispatching Procedure(s):

Present method of keeping track of field units:

Describe the procedures whereby field units can check the following:

Vehicle License Plate Number:

Vehicle Identification Number:

Driver's License Number:

Wants and Warrants:

Property Serial Numbers:

Other:

Describe other information systems this department may have access to on a local, state, national and international basis.

3. COMMUNICATIONS PROBLEMS

Field Units:

List and describe the three major communications problems (concerns) which affect these units.

Complaint Operators:

List and describe the most significant problems experienced by complaint entry operators.

Dispatchers:

List and describe the major problems or concerns of the dispatcher(s) which are substantially different from those listed above.

Records:

List and describe the problems experienced in the records section that differ from those listed above.

Administrative:

List and describe the major problems or concerns experienced by the administrators in this department.

Overview Concerns:

Describe a "critical incident" which occurred within this department within the past year (unusual occurrences or "war stories"). (Supply clippings, if available.)

In YOUR opinion, how would data communications improve the operations of this department? BE SPECIFIC.

In YOUR opinion, what are the short-comings of this department's existing system:

4. DATA PROCESSING INFORMATION

Provide as much information as possible in answer to the following questions but DO NOT contact the department's data processing personnel in obtaining it.

What data processing services are now serving the community government? Do they have their own computer center? Is there time-sharing among several communities. GIVE DETAILS.

Who is in charge of the data processing center, and how will he influence the purchase of a data communications system by this police department? Why?

What services does data processing currently provide to the police department? (Statistical reports, payrolls, etc.) LIST SPECIFICS if known.

How is data processing currently being used for resource management? (Car deployment, etc.)

How does data processing currently assist the dispatching or other operational functions?

What additional services would the department like to receive from data processing center?

What is the attitude of the police department toward the data processing center?

5. PURCHASING FACTORS

Who are the real "decision makers" that affect this agency? Do you know them and do you have ready access to them?

NAMES OF DECISION MAKERS	TITLE	KNOW?	ACCESS?
--------------------------	-------	-------	---------

Who are the "thought leaders?" (Those are people who may influence the decision makers, positively or negatively, such as: consulting firms, political action groups, news media, funding agency.)

NAMES OF THOUGHT LEADERS	KNOW?	ACCESS?
--------------------------	-------	---------

[illegible]

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper appears to be from a notebook or a standard ruled sheet of paper. There is no handwriting or other markings on the page.

Design Formulas*

$$\begin{aligned}
 \text{A. Trunk Workload} &= \frac{\text{Peak call rate (calls/hour)} \times \text{call duration (seconds)}}{3600} \\
 \text{B. Delay} &= \frac{\text{mean waiting time in seconds}}{\text{mean operator time in seconds}} \\
 \text{C. Operator Workload} &= \frac{\text{peak call rate (calls/hour)} \times \text{mean service time in seconds}}{3600}
 \end{aligned}$$

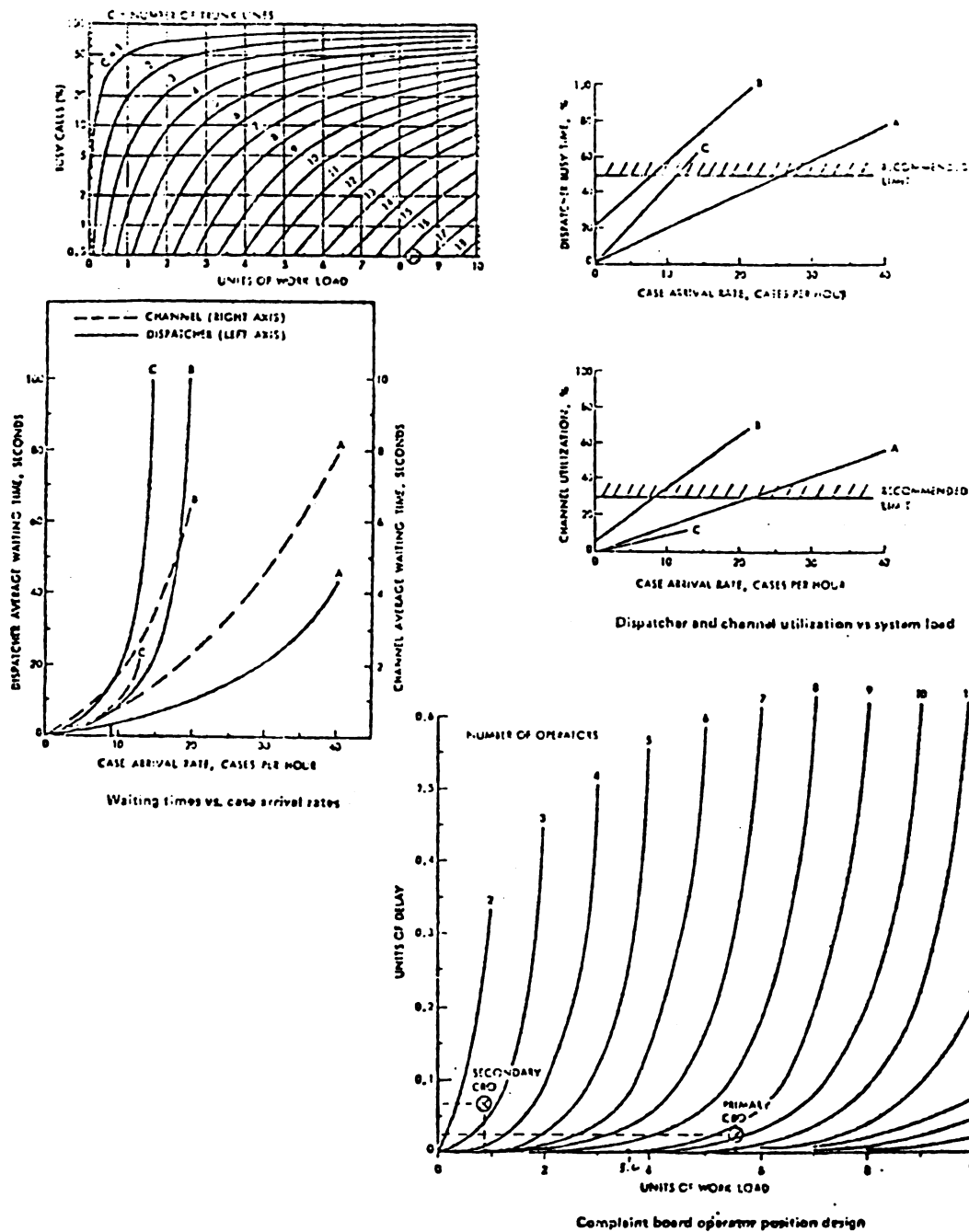
The above formulas were utilized to determine the following information:

- A. Number of trunklines required during peak loads;
- B. Average waiting time for a caller to receive assistance, and,
- C. The number of operators required at peak time to maintain a waiting time of less than the specified number of seconds.

The following graphs were used in conjunction with the above formulas to determine the number of trunklines and operators at peak times.

These formulas and graphs were used in conjunction with those presented in Chapter IV (page 53) to assist in the planning and decision making.

* Source: Application of Computer-Aided Dispatch in Law Enforcement, 1975.



Source: Application of Computer-Aided Dispatch in Law Enforcement, 1975.

911 Systems in Comparable Population
Centers*

Madison County, Alabama	1/72	PFA	130,000
Anchorage, Alaska	10/74	PFA,HP	120,000
Monterey County, California	3/73	PFA,0	308,000
Macon, Georgia	5/70	PFA,0	130,000
Baton Rouge, Louisiana	9/70	PFA	149,000
Springfield, Massachusetts	4/69	PFA	174,500
Worcester, Massachusetts	8/70	PFA	186,600
Muskegon, Michigan	2/72	---	125,000
Jackson, Mississippi	4/69	PFA	165,000
Jersey City, New Jersey	12/72	PFA	305,900
Albuquerque, New Mexico	11/71	PFA,S,HP,0	300,000
Broome County, New York	6/73	PFA	221,800
York County, Pennsylvania	10/74	---	290,000
Nashville, Tennessee	4/72	PFA,HP,S,0	335,000

A = Ambulance
P = Police
F = Fire
S = Sheriff

HP = Highway Patrol
0 = Other, e.g., poison control,
suicide prevention, etc.

*Source: 911, The Emergency Telephone Number: A Handbook
for Community Planning. Government Printing Office, 1973.

APPENDIX B

SURVEY AND STUDY RESULTS

Survey Data

The following pages contain: (1) survey adapted for use by the Lansing Police Department from the Motorola Survey Form; (2) completed survey from the Lansing Police Department; (3) completed survey from the Lansing Fire Department; (4) completed survey from the Ingham County Sheriff's Department; and (5) completed survey from the Lansing Township Police Department.

The Informational Survey Form for the 911 Computer-Aided Dispatch Communications Center was adopted from the Motorola Data Workshop, Pre-Assignment Survey Form. The changes in the form to meet Lansing's needs are discussed in Chapter IV. Detailed data obtained from the surveys and narrative responses are contained in the remaining four surveys. This provides numbers of personnel and calls for service history by year, time of day and service received. Also queried were LEIN transactions, number of vehicles, radios and assigned frequencies.

Narrative responses were completed regarding current methods of communications, records and data processing information. These completed surveys, in addition to the other data presented in this chapter, formed the base for decision making and planning.

Fire Ambulance Data

The majority of data for fire and ambulance runs was obtained through a telephone survey of the jurisdictions in Ingham County. Most of these agencies are small departments and do not publish annual reports. The results of the survey are presented below.

INFORMATIONAL SURVEY FORM

FOR THE

911 COMPUTER-AIDED DISPATCH COMMUNICATIONS CENTER

NAME: _____

TITLE: _____

R.C.R.#: _____

PHONE: _____

DEPARTMENT: _____

POPULATION SERVED: _____

AREA SQUARE MILES: _____

1. GENERAL INFORMATION

Number of Personnel

	Midnight	Day	Evening	TOTAL
Uniformed				
Investigative				
Complaint				
Dispatchers				
Records				
Administrative				
TOTAL				

Number of Calls for Service

1973	Day	Evening	Night	TOTAL
Received Switchboard				
Received Complaint Operators				
Number Dispatched				
TOTAL				
1974				
Received Switchboard				
Received Complaint Operators				
Number Dispatched				
TOTAL				
1975				
Received Switchboard				
Received Complaint Operators				
Number Dispatched				
TOTAL				

Number of LEIN Transactions

	Number of LEIN Queries (Vehicle Check, Warrants, Etc.)	Administrative Messages (Warrant Inputs, Cancellations, Etc.)
1973		
1974		
1975		

Number of Vehicles & Radios

	1973	1974	1975
Number of Vehicles	_____	_____	_____
Number of Mobile Radios	_____	_____	_____
Number of Portables	_____	_____	_____

Number of Radio Channels

	UHF	VHF	Low Band
Uniformed			
Investigation			
Other			

2. OPERATIONS

Describe Complaint Entry Procedure(s):

Describe Dispatching Procedure(s):

Present Method of Keeping Track of Field Units:

Describe the Procedure(s) Whereby Field Units Can Check the Following:

Vehicle License Plate Number:

Vehicle Identification Number:

Driver's License Number:

Property Serial Numbers:

Other:

Describe other information systems this department may have access to on a local, state, national and international basis.

3. COMMUNICATIONS PROBLEMS

Field Units:

List and describe the three major communications problems (concerns) which affect these units.

Complaint Operators:

List and describe the most significant problems experiences by complaint entry operators.

Dispatchers:

List and describe the major problems or concerns of the dispatcher(s) which are substantially different from those listed above.

Records:

List and describe the problems experienced in the records section that differ from those listed above.

Administrative:

List and describe the major problems or concerns experienced by the administrators in this department.

In YOUR opinion, what are the short-comings of this department's existing system:

4. DATA PROCESSING INFORMATION

What data processing services are now serving the community government? Do they have their own computer center? Is there time-sharing among several communities. GIVE DETAILS.

What services does data processing currently provide to the police department? (Statistical reports, payrolls, etc.) LIST SPECIFICS, if known.

How is data processing currently being used for resource management? (Car deployment, etc.)

How does data processing currently assist the dispatching or other operational functions?

What additional services would the department like to receive from data processing center?

What is the attitude of the police department toward the data processing center?

INFORMATIONAL SURVEY FORM

FOR THE

911 COMPUTER-AIDED DISPATCH COMMUNICATIONS CENTER

NAME: James Heyden TITLE: Lieutenant

R.C.R.#: _____ PHONE: 372-9400 Ext. 265

DEPARTMENT: Lansing Police Department

POPULATION SERVED: 135,219 AREA SQUARE MILES: 33.78

1. GENERAL INFORMATION

Number of Personnel

	Midnight	Day	Evening	TOTAL
Uniformed	33	51	47	131
Investigative		39		39
Complaint	8	9	12	29
Dispatchers	6	6	5	17
Records		24		24
Administrative	9	48	10	67
Matron		1		1
Radio Lab		3		3
TOTAL	56	181	74	311

Number of Calls for Service

1973	Day	Evening	Night	TOTAL
Received Switchboard	NA	NA	NA	NA
Received Complaint Operators	NA	NA	NA	NA
Number Dispatched	14,295	23,935	14,129	52,359
TOTAL				
1974				
Received Switchboard	NA	NA	NA	NA
Received Complaint Operators	NA	NA	NA	NA
Number Dispatched	16,567	25,428	14,183	56,178
TOTAL				
1975				
Received Switchboard	NA	NA	NA	420,480 Avg.
Received Complaint Operators				140,160 Avg.
Number Dispatched	17,053	26,535	15,730	59,318 Act.
TOTAL				

Number of LEIN Transactions

	Number of LEIN Queries (Vehicle Check, Warrants, Etc.)	Administrative Messages (Warrant Inputs, Cancellations, Etc.)
1973	50,956	5,746
1974	64,185	NA
1975	77,056	NA

Number of Vehicles & Radios

	1973	1974	1975
Number of Vehicles	<u> </u>	<u>107</u>	<u>106</u>
Number of Mobile Radios	<u>38</u>	<u>40</u>	<u>40</u>
Number of Portables	<u>86</u>	<u>100</u>	<u>101</u>

Number of Radio Channels

	UHF	VHF	Low Band
Uniformed	2		
Investigation	2	2	
Other			

2. OPERATIONS

Describe Complaint Entry Procedure(s):

Switchboard operator transfers call to complaint taker-dispatcher, dispatch
ticket is completed and call is dispatched (if complaint taker is not
dispatcher, card will be passed to him).

Describe Dispatching Procedure(s):

Complainant call answer by switchboard operator who listens to complaint
then manually transfers caller to complaint taker-dispatcher dispatcher
reviews status map sends closest unit(s) to call.

Present Method of Keeping Track of Field Units:

Status map located at top of console between 2 primary dispatchers. One
light for each unit. Lights deactivated (out of service) by placing dispatch
ticket in card slot.

Describe the Procedure(s) Whereby Field Units Can Check the Following:

Vehicle License Plate Number:

Switch from main frequency to LEIN channel for query and stand by until
check is completed. No scan capabilities; therefore out of touch with unit
on main frequency.

Vehicle Identification Number:

Same as vehicle plate number.

Driver's License Number:

Same as vehicle plate number.

Property Serial Numbers:

Same as vehicle plate number.

Other:

Describe other information systems this department may have access to on a local, state, national and international basis.

Law Enforcement Information Network

Lansing Area Law Enforcement System

National Crime Information Center

3. COMMUNICATIONS PROBLEMS

Field Units:

List and describe the three major communications problems (concerns) which affect these units.

Background noise from operations center. Inability of dispatchers to
maintain status of field units accurately. Dispatchers fail to answer
calls of field units because dispatchers are taking complaints over the
phone.

Complaint Operators:

List and describe the most significant problems experienced by complaint entry operators.

Insufficient manpower. Complaint operator may also be a dispatcher.

Dispatchers:

List and describe the major problems or concerns of the dispatcher(s) which are substantially different from those listed above.

Inability to maintain correct status of field officers reducing their
safety. Ineffective location of radio equipment that should be directly
under the dispatcher's control.

Records:

List and describe the problems experienced in the records section that differ from those listed above.

Multiple manual duplication of records in conjunction with automated
records. Unable to retrieve certain information.

Administrative:

List and describe the major problems or concerns experienced by the administrators in this department.

Productivity of employees - valid data & statistics.

In YOUR opinion, what are the short-comings of this department's existing system:

Insufficient manpower to effectively staff operations units.

4. DATA PROCESSING INFORMATION

What data processing services are now serving the community government? Do they have their own computer center? Is there time-sharing among several communities. GIVE DETAILS.

Lansing has a data center which shares time between various governmental
departments. Lansing Police Department has dedicated to it an on-line
records system (L.A.L.E.S.) which takes up approximately 114K or half
of the available core of the city's Honeywell 2015 system.

What services does data processing currently provide to the police department? (Statistical reports, payrolls, etc.) LIST SPECIFICS, if known.

Crime Specific, Calls for Service, Dispatch Incident, Calls for Service
Specific, Police Offense, On-Line Criminal Records (L.A.L.E.S.); these
give time of day, day of week by crime type and service call type year
to date, 3 month %, current month and average.

How is data processing currently being used for resource management? (Car deployment, etc.)

Redistricting of city and suggested manpower requirements by district.
Crime target areas. Suggested leave days for officers.

How does data processing currently assist the dispatching or other operational functions?

Dispatching is not assisted. Planning and research function is the major
consumer and user of data processing. Crime Prevention and Helicopter
Unit uses statistics for flight information and alarm analysis, crime
specific areas for targeting.

What additional services would the department like to receive from data processing center?

Computer Analysis for: 1) manpower deployment, 2) automated U.C.R.'s,
3) statistical analysis of crime, 4) M.O.-P.A., 5) automated booking, and
6) C.A.D.

What is the attitude of the police department toward the data processing center?

Field personnel do not accept data processing and blame errors in
computer program runs on the computer rather than their errors in data
collection. Administration personnel have accepted data processing much
better but still need convincing.

INFORMATIONAL SURVEY FORM

FOR THE

911 COMPUTER-AIDED DISPATCH COMMUNICATIONS CENTER

NAME: William H. Eisele TITLE: Chief Dispatcher

R.C.R.#: PHONE: 485-7241 Ext. 30

DEPARTMENT: Lansing Fire Dept.

POPULATION SERVED: 135,500 AREA SQUARE MILES: 33.87

1. GENERAL INFORMATION

Number of Personnel

	Midnight	Day	Evening	TOTAL
Uniformed				
Investigative				
Complaint				
Dispatchers		1 /	1 /	4
Records		1		1
Administrative				
TOTAL		3	2	5

Dispatcher works a 12 hour shift, 3 days on and three off.

Chief dispatcher works relief and works on records.

Number of Calls for Service

Day shift: 7:00AM-7:00PM

Night Shift: 7:00PM-7:00AM

1973	Per Day / Per Year		Per Day/Per Yr.	
	Day	Evening	Night	TOTAL
Received Switchboard	385 - 140,525	N/A	65 - 23,725	164,250
Received Complaint Operators	N/A	N/A	N/A	N/A
Number Dispatched Average	9.3		9.7	6,845
TOTAL				171,095
1974				
Received Switchboard	390 - 142,350	N/A	69 - 25,185	167,535
Received Complaint Operators				
Number Dispatched Average	9.7		9.6	7,038
TOTAL				174,573
1975				
Received Switchboard	472 - 172,280	N/A	75 - 27,375	205,655
Received Complaint Operators				
Number Dispatched	11.3		11.3	8,254
TOTAL				213,909

1976 @ 6 months
- Runs Dispatched

11.0

12.3

4,241

Number of LEIN Transactions

	Number of LEIN Queries (Vehicle Check, Warrants, Etc.)	Administrative Messages (Warrant Inputs, Cancellations, Etc.)
1973		
1974		
1975		

Number of Vehicles & Radios

	1973	1974	1975
Number of Vehicles	<u>50</u>	<u>52</u>	<u>52</u>
Number of Mobile Radios	<u>49</u>	<u>51</u>	<u>51</u>
Number of Portables	<u>25</u>	<u>26</u>	<u>30</u>

Number of Radio Channels

	UHF	VHF	Low Band
Uniformed			
Investigation			
Other		4	

2. OPERATIONS

Describe Complaint Entry Procedure(s):

Describe Dispatching Procedure(s):

Our operation is a one man, handles everything. Answers switchboard,
dispatchs emergency equipment, handles radio and logs everything.

Present Method of Keeping Track of Field Units:

Log sheet and status board.

Describe the Procedure(s) Whereby Field Units Can Check the Following:

Vehicle License Plate Number:

LANSING FIRE DEPARTMENT DISPATCH
DIVISION

The Dispatch Division is a five person division responsible for all communications pertaining to emergency calls from the Citizens of Lansing and surrounding areas. All business calls are received and transferred through this office. A total of 8,254 emergency calls were handled by this office in 1975. We are showing a 6 percent increase over last year.

Our operations are, in order of priority:

1. Receive and dispatch emergency calls from telephone, radio and box alarms.
2. Business calls transferred throughout the Department and to City Hall.
3. Alarms and information received from and transmitted to Fire Department apparatus.
4. Recording of emergency calls, maps and log books, etc.
5. Supervision of personnel.
6. Maintain records of emergency reports filed on each incident. Prepare reports to Chief, Fire Board, City and State Fire Marshals.
7. Test and retain records of the Gamewell Equipment.
8. Instructions given to all Divisions of communication procedures and preparation of Fire and Ambulance reports.

The major overall problem is manpower. One person cannot efficiently handle each phase of our entire operation. Due to the total emergency calls that are handled, we should have at least two dispatchers on duty at all times.

Vehicle Identification Number:

Driver's License Number:

Property Serial Numbers:

Other:

Describe other information systems this department may have access to on a local, state, national and international basis.

3. COMMUNICATIONS PROBLEMS

Field Units:

List and describe the three major communications problems (concerns) which affect these units.

Complaint Operators:

List and describe the most significant problems experiences by complaint entry operators.

Dispatchers:

List and describe the major problems or concerns of the dispatcher(s) which are substantially different from those listed above.

Records:

List and describe the problems experienced in the records section that differ from those listed above.

Administrative:

List and describe the major problems or concerns experienced by the administrators in this department.

In YOUR opinion, what are the short-comings of this department's existing system:

4. DATA PROCESSING INFORMATION

What data processing services are now serving the community government? Do they have their own computer center? Is there time-sharing among several communities. GIVE DETAILS.

What services does data processing currently provide to the police department? (Statistical reports, payrolls, etc.) LIST SPECIFICS, if known.

How is data processing currently being used for resource management? (Car deployment, etc.)

How does data processing currently assist the dispatching or other operational functions?

What additional services would the department like to receive from data processing center?

What is the attitude of the police department toward the data processing center?

INFORMATIONAL SURVEY FORM
FOR THE
911 COMPUTER-AIDED DISPATCH COMMUNICATIONS CENTER

NAME: Michael F. Carpenter

TITLE: Sergeant

R.C.R.#: _____

PHONE: 676-2431

DEPARTMENT: Ingham County Sheriff Department

POPULATION SERVED: 261,039

AREA SQUARE MILES: 550

1. GENERAL INFORMATION

Number of Personnel

	Midnight	Day	Evening	TOTAL
Uniformed	10	13	10	33
Investigative	1	9	1	11
Complaint	1	1	1	3
Dispatchers	1	2	2	5
Records	-	3	-	3
Administrative	1	10	1	10
TOTAL	14	30	23	67

This does not include any township personnel that are dispatched through this department.

Number of Calls for Service

1973	Day	Evening	Night	TOTAL
Received Switchboard	NA	NA	NA	143,978
Received Complaint Operators	NA	NA	NA	NA
Number Dispatched	NA	NA	NA	33,226
TOTAL	NA	NA	NA	177,204
1974				
Received Switchboard	NA	NA	NA	228,120
Received Complaint Operators	NA	NA	NA	NA
Number Dispatched	NA	NA	NA	34,174
TOTAL	NA	NA	NA	262,294
1975				
Received Switchboard	NA	NA	NA	218,777
Received Complaint Operators	NA	NA	NA	NA
Number Dispatched	NA	NA	NA	37,289
TOTAL	NA	NA	NA	266,066

Number of LEIN Transactions

	Number of LEIN Queries (Vehicle Check, Warrants, Etc.)	Administrative Messages (Warrant Inputs, Cancellations, Etc.)
1973	80,511	4,105
1974	87,419	4,394
1975	116,114	6,476

Number of Vehicles & Radios

	1973	1974	1975
Number of Vehicles	<u>40</u>	<u>45</u>	<u>64</u>
Number of Mobile Radios	<u>40</u>	<u>45</u>	<u>81</u>
Number of Portables	<u>12</u>	<u>12</u>	<u>37</u>

Number of Radio Channels

	UHF	VHF	Low Band
Uniformed	1	-	-
Investigation	1	-	-
Other	-	1	-

2. OPERATIONS

Describe Complaint Entry Procedure(s):

Recieved at complaint desk, information taken by Command Officer and
placed on complaint card (IBM size). Hand carried to dispatcher and
time stamped.

Describe Dispatching Procedure(s):

Incident card is filled in by shift commander, hand carried to the
dispatcher, time stamped and given to dispatcher for decemination to
available field unit. Time stamped when given out, time arrived, time
clear.

Present Method of Keeping Track of Field Units:

If assigned a call, status is kept on time stamped incident card.
All other status is kept in long hand on a scratch pad for each shift.

Describe the Procedure(s) Whereby Field Units Can Check the Following:

Vehicle License Plate Number:

Through LEIN via police dispatcher.

Vehicle Identification Number:

Through LEIN via police dispatcher

Driver's License Number:

Through LEIN via Police dispatcher

Property Serial Numbers:

Through NCIC via police dispatcher

Other:

Describe other information systems this department may have access to on a local, state, national and international basis.

LEIN, ALECS, NLETS, NCIC.

3. COMMUNICATIONS PROBLEMS

Field Units:

List and describe the three major communications problems (concerns) which affect these units.

Air traffic time: Too much verbal communications.

Recording Call: Having to stop to record incident info

Work load on one Dispatcher: Relying on single dispatcher for Query Checks.

Complaint Operators:

List and describe the most significant problems experienced by complaint entry operators.

Unable to adequately supervise the filed units they are responsible for,
because of having to receive all complaint calls and walk in traffic at
the complaint desk. Definite lack of speed in getting incident calls to
the dispatcher.

Dispatchers:

List and describe the major problems or concerns of the dispatcher(s) which are substantially different from those listed above.

Handwriting on some incident cards. Lack of Information on incident
cards. Consistent verbal communications over loading air traffic time.

Unaware of incidents that might be similar.

Records:

List and describe the problems experienced in the records section that differ from those listed above.

Time consumed in manually checking reporting and compiling records information.

Administrative:

List and describe the major problems or concerns experienced by the administrators in this department.

Not having statistics available for correct manpower assignments and selective enforcement planning.

In YOUR opinion, what are the short-comings of this department's existing system:

Lack of manpower to operate existing system. Unable to provide accurate statistics for management without extensive research.

4. DATA PROCESSING INFORMATION

What data processing services are now serving the community government? Do they have their own computer center? Is there time-sharing among several communities. GIVE DETAILS.

Payroll, complete accounting; jury selection; friend of the court work;

budget setup; probate court shild care.

What services does data processing currently provide to the police department? (Statistical reports, payrolls, etc.) LIST SPECIFICS, if known.

Budget status; payroll.

How is data processing currently being used for resource management? (Car deployment, etc.)

NONE

How does data processing currently assist the dispatching or other operational functions?

Through Query checks only (LEIN System)

What additional services would the department like to receive from data processing center?

*Management data; incident statistics; geographical file (county-wide);
duty assignments; status of field units; retention of all records in
data files with on line access.*

What is the attitude of the police department toward the data processing center?

*Most managerial are unaware of what is available through data processing
except what is now in use through the LEIN system. Of those persons
aware of data processing, capabilities, there is a continuous study
researching the possibilities of what data processing will do for our
department and ofcourse the factor of cost.*

INFORMATIONAL SURVEY FORM
FOR THE
911 COMPUTER-AIDED DISPATCH COMMUNICATIONS CENTER

NAME: _____ TITLE: _____

R.C.R.#: _____ PHONE: 371-3460

DEPARTMENT: Lansing Township Police Dept.

POPULATION SERVED: 11,200 AREA SQUARE MILES: 8.5

1. GENERAL INFORMATION

Number of Personnel

	Midnight	Day	Evening	TOTAL
Uniformed	5	3	4	12
Investigative		2		2
Complaint				
Dispatchers	1	1	1	3
Records		1		1
Administrative		1		1
TOTAL				19

Number of Calls for Service

1973	Day	Evening	Night	TOTAL
Received Switchboard				
Received Complaint Operators				
Number Dispatched				
TOTAL				4,475
1974				
Received Switchboard				
Received Complaint Operators				
Number Dispatched				
TOTAL				4,684
1975				
Received Switchboard				
Received Complaint Operators				
Number Dispatched				
TOTAL				4,261

Number of LEIN Transactions

	Number of LEIN Queries (Vehicle Check, Warrants, Etc.)	Administrative Messages (Warrant Inputs, Cancellations, Etc.)
1973		
1974		
1975		

Above information unknown - due to the fact Ingham Co. Sheriff Dept. handles our LEIN queries.

Number of Vehicles & Radios

	1973	1974	1975
Number of Vehicles	<u>6</u>	<u>6</u>	<u>6</u>
Number of Mobile Radios	<u>6</u>	<u>6</u>	<u>6</u>
Number of Portables	<u>4</u>	<u>5</u>	<u>7</u>

Number of Radio Channels

	UHF	VHF	Low Band
Uniformed	<u>1</u>		
Investigation			
Other			

2. OPERATIONS

Describe Complaint Entry Procedure(s):

COMPLAINT RECEIVED BY DISPATCHER FORWARDED TO CLOSEST
UNIT. DISPATCHER LOGS COMPLAINT ON ^{SOFT AND} TYPED RADIO LOG
AND INTO COMPLAINT BOOK. NUMBERS ARE SEQUENTIAL.
MINOR COMPLAINTS ON RADIOLOG AND COMPLAINT BOOK; MORE
SERIOUS COMPLAINTS HAVE TYPED REPORTS

Describe Dispatching Procedure(s):

Call is received by the dispatcher,
who in turn writes it on a soft log,
then dispatches the closest available
unit. The unit answering besides if the
complaint is a logged or written report.

Present Method of Keeping Track of Field Units:

Patrol units with this Dept. do not
have assigned districts, due to small
working area. Dispatch calls units for
their location, and logs their location
each time they check out on a call etc.

Describe the Procedure(s) Whereby Field Units Can Check the Following:

Vehicle License Plate Number:

All Line Queries Done by
Ingham Co. Sheriff Dept. - We have
their radio frequency

Vehicle Identification Number:

All run thru ICSID.

Driver's License Number:

All run thru ICSID

Property Serial Numbers:

All run thru ICSID

Other:

Describe other information systems this department may have access to on a local, state, national and international basis.

RELY ON TRI-COUNTY FREQUENCY FOR ATL'S
AREA BROADCASTS

3. COMMUNICATIONS PROBLEMS

Field Units:

List and describe the three major communications problems (concerns) which affect these units.

Due to the fact we have to go through another Dept for being Quarries - the time factor is probably the single most ^{acute} problem concerning the field units. VERY LITTLE USE OF LEIN & SOS COMPUTERS BECAUSE OF ABOVE PROBLEM, - LEIN NOT EFFECTIVELY UTILIZED. NO LEIN BROADCASTS AVAILABLE -
Complaint Operators: ESPECIALLY FOR URGENT (NON-AIRABLE) BROADCASTS.

List and describe the most significant problems experienced by complaint entry operators.

During daytime hours our complaint operator answers all calls for entire Township offices and on busy days becomes extremely busy on telephone lines, ALSO DISPATCHES FIRE DEPARTMENT.

Dispatchers:

List and describe the major problems or concerns of the dispatcher(s) which are substantially different from those listed above.

SAME PROBLEM AS ABOVE.

Records:

List and describe the problems experienced in the records section that differ from those listed above.

18 OFFICERS UTILIZE 1 SECRETARY FOR
Typing of complaints, FILING, TICKET FILING,
LOGGING, LEIN & NCIC WORKSHEETS FOR ENTRY,
LETTERS ETC, CONSEQUENTLY PRIORITIES TAKE OVER,
AND OTHER AREAS ARE THUS DELAYED IN PROCESSING

Administrative:

List and describe the major problems or concerns experienced by the administrators in this department.

In YOUR opinion, what are the short-comings of this department's existing system:

NEED MORE MANPOWER AND FUNDS.

4. DATA PROCESSING INFORMATION

What data processing services are now serving the community government? Do they have their own computer center? Is there time-sharing among several communities. GIVE DETAILS.

What services does data processing currently department? (Statistical reports, payrolls, if known.

Not applicable

How is data processing currently being used (Car deployment, etc.)

1975 FIRE RESPONSES

<u>Agencies</u>	<u>Alarms</u>	<u>Ambulance</u>
Lansing Township	153	60
Lansing	3,555	4,699
East Lansing	503	905
Delhi	171	379
Mason	97	N/A
Meridian Township	635	711
Stockbridge	N/A*	289
Dansville	N/A*	
Leslie	N/A*	
Onondaga	N/A*	
Webberville	N/A*	

*Statistics are estimated to be under 100 responses.

Frequency Utilization Time Study--
Analysis

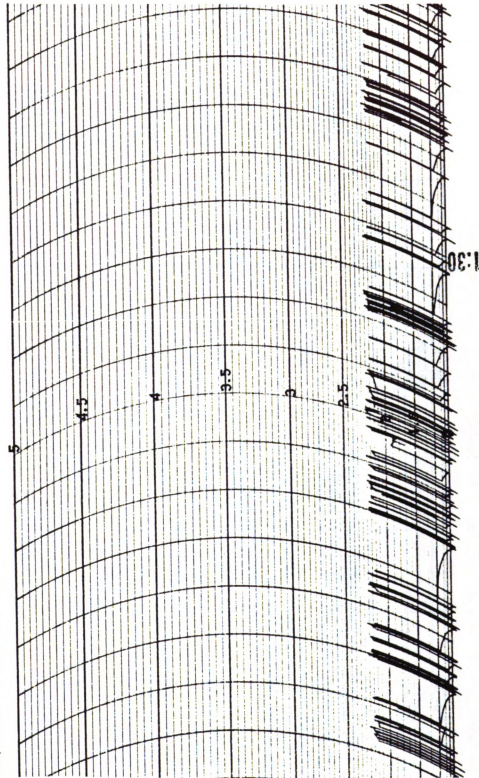
Time studies were performed to determine the "busy time" of dispatchers and the rate of frequency utilization during peak times. The radio channels utilized by the Lansing Police Department were monitored for a week period during the month of December, 1976. Monitoring equipment was installed by Radio Engineers employed by the Lansing Police Department.

Page 214 contains a sample of the graph made by the monitoring equipment. The hour(s) of the monitoring is printed on the graph paper itself. Each vertical curved line that extends from the top to bottom of the page represents the beginning of a 2.5 minute time span (right to left).

Red lines that extend upward from the bottom of the graph indicate when the frequency is being utilized. When the red moves horizontally that indicates that the frequency is not in use. In conjunction with the graphs a chart was developed that was used to determine the percent of frequency utilization by hour of the day.

A series of three charts follow the example of the graph. They depict utilization rates for channels one, two and four. Channel one is the main patrol frequency, two is radio for LEIN checks and administrative messages, and four is for special units. Results of the monitoring of channel one indicates that the frequency is over used (Chapter IV). This also indicates that the dispatcher's "busy time" is far too high. Interacting with the radio reflects only a portion of current duties and thus demonstrates that levels of "busy time" and stress exceed recommended levels.

ND., U.S.A. CHART NO. 1310-E



Sample Graph of Radio Frequency Utilization.

STATUS - 47% of channel reductions
 Status - 18% load reductions

Radio Channel 1
 Date 12-10 (FRI, 1100-2400) 12-11 (SAT, 0000-1100)

TIME (1/2 HR. INTERVALS)	NO. TIMES CUED	CUE TIME CONSUMED	TIME (1/2 HR. INTERVALS)	NO. TIMES CUED	CUE TIME CONSUMED
1400 - 1430	12-11-76	15.25	1400 - 1430	12-10-76	17.60
1430 - 1500		16.70	1430 - 1500		13.80
1500 - 1530		15.45	1500 - 1530		20.50
1530 - 1600		15.45	1530 - 1600		17.15
1600 - 1630		14.85	1600 - 1630		19.80
1630 - 1700		13.75	1630 - 1700		11.00
1700 - 1730		9.75	1700 - 1730		17.05
1730 - 1800		8.55	1730 - 1800		16.90
1800 - 1830		4.85	1800 - 1830		17.95
1830 - 1900		10.05	1830 - 1900		14.10
1900 - 1930		7.95	1900 - 1930		13.95
1930 - 2000		6.50	1930 - 2000		19.85
2000 - 2030		2.60	2000 - 2030		19.80
2030 - 2100		5.30	2030 - 2100		15.50
2100 - 2130		6.05	2100 - 2130		9.90
2130 - 2200		13.80	2130 - 2200		25.60 *
2200 - 2230		6.30	2200 - 2230		17.30
2230 - 2300		8.35	2230 - 2300		17.45
2300 - 2330		8.05	2300 - 2330		17.20
2330 - 2400		10.70	2330 - 2400		21.05
		8.40			
		16.70			
		14.30			
		14.80			
		14.50			
		18.80			
		18.25			
TOTAL			TOTAL		
AVERAGE			AVERAGE		
PEAK TIME BY			PEAK TIME BY		
TIME OF DAY			TIME OF DAY		

(55% of the time)
 (47% Utilization)
 For 24-hr
 676.25 (TOTAL 14400)

Radio Channel 2
 Date 12-8 (1030-2400) 12-9 (400-1000) ^{WFO} ^{THUR}

Time Period

TIME (1/2 HR. INTERVALS)	NO. TIMES CUF	CUE TIME CONSUMED	TIME (1/2 HR. INTERVALS)	NO. TIMES CUF	CUE TIME CONSUMED
12-9-76			12-8-76		
0000 - 0030	18	4.90	1400 - 1430	16	6.75
0030 - 0100	23	6.35	1430 - 1500	48	19.75
0100 - 0130	16	3.45	1500 - 1530	11	19.20
0130 - 0200	18	4.70	1530 - 1600	14	6.75
0200 - 0230	15	6.15	1600 - 1630	52	18.75
0230 - 0300	12	5.15	1630 - 1700	13	4.75
0300 - 0330	15	4.05	1700 - 1730	22	1.25
0330 - 0400	20	6.90	1730 - 1800	26	6.35
0400 - 0430	14	4.50	1800 - 1830	11	1.25
0430 - 0500	3	1.75	1830 - 1900	15	3.45
0500 - 0530	0	0	1900 - 1930	8	1.75
0530 - 0600	0	0	1930 - 2000	13	2.50
0600 - 0630	1	3.35	2000 - 2030	13	5.65
0630 - 0700	0	3.00	2030 - 2100	21	5.75
0700 - 0730	0	0	2100 - 2130	16	4.00
0730 - 0800	16	2.00	2130 - 2200	19	1.00
0800 - 0830	23	3.65	2200 - 2230	9	3.50
0830 - 0900	19	7.35	2230 - 2300	19	3.00
0900 - 0930	4	5.60	2300 - 2330	9	3.25
0930 - 1000	unk	1.00	2330 - 2400		
1000 - 1030	24	unk			
1030 - 1100	20	11.25			
1100 - 1130	4	1.75			
1130 - 1200	28	11.75			
1200 - 1230	35	12.25			
1230 - 1300	18	7.85			
1300 - 1330	12	4.45			
1330 - 1400					
TOTAL	385	130.70	TOTAL	691	243 min. (1598 sec)
AVERAGE			AVERAGE		
PEAK TIME BY			PEAK TIME BY		
TIME OR DAY			TIME OR DAY		

17% Disposition

Radio Channel 4
 Date 12-9-1999 THUR
12-10-1999 FAR

TIME (1/2 HR. INTERVALS)	NO. TIMES CUED	CUE TIME CONSUMED	TIME (1/2 HR. INTERVALS)	NO. TIMES CUED	CUE TIME CONSUMED
0300 - 0330	2	.4	1400 - 1430	7	1.65
0330 - 0400	1	.2	1430 - 1500	13	2.75
0400 - 0430	4	.9	1500 - 1530	4	.90
0430 - 0500	1	.2	1530 - 1600	4	2.45
0500 - 0530	0	.0	1600 - 1630	7	2.65
0530 - 0600	1	.2	1630 - 1700	3	.90
0600 - 0630	5	.45	1700 - 1730	7	2.10
0630 - 0700	0	.0	1730 - 1800	0	.0
0700 - 0730	1	.2	1800 - 1830	4	1.80
0730 - 0800	0	.0	1830 - 1900	6	1.30
0800 - 0830	1	.2	1900 - 1930	10	2.10
0830 - 0900	6	1.7	1930 - 2000	12	3.65
0900 - 0930	0	.0	2000 - 2030	15	4.00
0930 - 1000	0	.0	2030 - 2100	10	3.00
1000 - 1030	2	.4	2100 - 2130	6	1.30
1030 - 1100	0	.0	2130 - 2200	5	1.35
1100 - 1130	3	1.75	2200 - 2230	1	.20
1130 - 1200	7	2.50	2230 - 2300	0	.0
1200 - 1230	0	.0	2300 - 2330	0	.0
1230 - 1300	0	.0	2330 - 2400	1	4.00
1300 - 1330	6	1.50			
1330 - 1400	8	1.50			
1400 - 1430	6	1.00			
1430 - 1500	6	1.70			
1500 - 1530	9	2.65			
1530 - 1600	3	.75			
1600 - 1630	10	2.20			
1630 - 1700	11	4.75			
1700 - 1730	0	.0			
1730 - 1800	0	.0			
1800 - 1830	0	.0			
1830 - 1900	0	.0			
1900 - 1930	0	.0			
1930 - 2000	0	.0			
2000 - 2030	0	.0			
2030 - 2100	0	.0			
2100 - 2130	0	.0			
2130 - 2200	0	.0			
2200 - 2230	0	.0			
2230 - 2300	0	.0			
2300 - 2330	0	.0			
2330 - 2400	0	.0			
TOTAL			TOTAL	228	58.35
AVERAGE			AVERAGE		
PEAK TIME BY			PEAK TIME BY		
TIME OR DAY			TIME OR DAY		

4 1/2 seconds

Calls for Service by Time of Day

	<u>Calls</u>			<u>Percent</u>		
	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
0000/0100						
0000/0100	2776	3160	3250	4.94	5.33	5.06
0100/0200	2320	2623	2639	4.13	4.42	4.11
0200/0300	2173	2472	2501	3.87	4.17	3.89
0300/0400	1455	1683	1710	2.59	2.84	2.66
0400/0500	888	986	1083	1.58	1.66	1.69
0500/0600	606	663	725	1.08	1.12	1.13
0600/0700	716	653	761	1.27	1.10	1.18
0700/0800	1214	1110	1421	2.16	1.87	2.21
0800/0900	1732	1897	1969	3.08	3.20	3.07
0900/1000	1754	1896	2148	3.12	3.20	3.34
1000/1100	1936	2082	2399	3.45	3.51	3.73
1100/1200	2253	2237	2577	4.01	3.77	4.01
1200/1300	2371	2539	2900	4.22	4.28	4.51
1300/1400	2394	2581	2861	4.26	4.35	4.45
1400/1500	2913	2711	3098	5.19	4.57	4.82
1500/1600	3048	2919	3643	5.43	4.92	5.67
1600/1700	3144	3508	3645	6.60	5.91	5.67
1700/1800	3253	3450	3667	5.79	5.82	5.71
1800/1900	3031	3184	3293	5.40	5.37	5.13
1900/2000	3149	3253	3371	5.61	5.48	5.25
2000/2100	3125	3206	3403	5.56	5.40	5.30
2100/2200	3266	3406	3540	5.81	5.74	5.51
2200/2300	3412	3609	3644	6.07	6.08	5.67
2300/2400	3249	3490	3993	5.78	5.88	6.22
TOTALS:	56,178	59,318	64,241			

Source: Calls for Service Summary, Police Dispatch System, Lansing.

APPENDIX C

STAFFING CALCULATIONS

911 CALCULATIONS FOR STAFFING

$$\text{I. Trunk Work Load} = \frac{\text{Peak Call Rate Call Duration (Sec.)}}{3600 \text{ sec. in an hour}}$$

$$\text{II. (a) C.B. Operators} = \frac{\text{Peak Call Rate Mean Service Time in Sec.}}{3600}$$

$$\text{(b) Delay} = \frac{\text{Mean Waiting Time in Sec.}}{\text{mean operator service time in seconds}}$$

System A: Separate CBO and dispatcher, dispatcher does not handle queries to remote data banks.

System B: Separate CBO and dispatcher, dispatcher handles queries to remote data banks.

System C: Dispatcher takes calls from public, but does not handle queries to remote data banks.

(1) Ten seconds is the maximum average waiting time for the 911 System or for field units to wait.

(2) Fifty percent average busy time is the most a dispatcher should handle.

(3) Thirty percent channel utilization rate is about maximum.

(4) Not more than 25 cases per hour for dispatchers.

III. Case Load

Cases per Dispatcher = Number of Dispatchers

#33--Peak call rate per hour for dispatcher

#428--Peak call rate per hour for switchboard

#124--Peak call rate per hour for CBO

$$\text{Trunk Work Load} = \frac{124 \times 150 \text{ sec. (waiting)}}{3600}$$

$$\text{Trunk Work Load} = 5.16 \text{ load units}$$

$$\text{Trunk Lines} = 12 \text{ under peak load}$$

$$\text{Delay} = \frac{\text{mean waiting time in sec. (5 sec.)}}{\text{mean operator service time in seconds (100 sec.)}}$$

$$\text{Delay} = \frac{5 \text{ sec.}}{100 \text{ sec.}}$$

$$\text{Delay} = .05$$

$$\text{Operator Work Load} = \frac{\text{peak call rate (call per hour)} \times \text{mean service time in seconds}}{3600}$$

$$\text{Operator Work Load} = \frac{124 \times 100}{3600}$$

$$\text{Operator Work Load} = 3.44$$

$$\text{CBO Needed} = \text{Six to seven operators}$$

$$\text{(C) Case Load} \\ \frac{\text{Calls per}}{\text{Dispatcher}} = \text{Number per dispatcher}$$

*System B: Separate CBO and dispatcher, dispatcher handles queries to remote data banks.

$$\text{Peak dispatchers per hour} = 9$$

$$\text{Peak LEIN inquiries} = 28$$

$$\text{Total Case} = 37$$

$$\frac{37}{11} = 3.36 \text{ dispatchers}$$

$$\text{System B} = \frac{4 \text{ dispatchers}}{5 \text{ CBO}} \quad \underline{9 \text{ Total}}$$

$$\begin{aligned} \text{*System C: } 6 \text{ dispatchers and } 2 &= 8 \text{ dispatchers} \\ &= 1 \text{ LEIN operator} \\ &\underline{9 \text{ Total}} \end{aligned}$$

$$\text{Peak Caller Rate to Complaint Taker} = 34$$

$$\text{Peak dispatchers per hour} = 9$$

$$\text{Total Case} = 43$$

$$\text{Operator Work Unit} = \frac{\text{Peak Call Rate 43 mean service 143 sec.}}{3600}$$

$$\text{Operator Work Unit} + 1.7$$

*2 additional dispatchers

Case Load Value of 21 per hour

$$\frac{\text{Case load (27 per hour)}}{\text{Cases per dispatcher (21 per hour)}} = \text{No. dispatchers}$$

$$\frac{27}{21} = 1.28 \text{ or } 2 \text{ dispatchers}$$

This will allow for a maximum busy time of 50 percent.

LEIN

$$\frac{84}{21} = 4 \text{ operators}$$

(D) System A: Separate CBO and dispatcher; dispatcher does not handle queries to remote data banks.

$$\frac{9}{21} = .428 \text{ dispatch}$$

1 dispatch
5 CBO
1 LEIN

7 TOTAL

I. A. $\text{CBO} - \frac{49 \ 90}{3600} \text{ sec. in an hour}$
CBO = 1.225 load unit

B. Delay Units = .111
CBO = 3

II. System A = $\frac{15}{25} = 0.6 \text{ dispatchers}$

CBO = 3
Dispatcher = 1
LEIN Operator = 1

Total = 5

Supervisor = 1

Parameters for Michigan Bell Telephone
Calculations for 911 Staffing

Estimated conversation time per call--1 minute, 10 seconds
Estimated work time per call--50 seconds

Conversation time per position per hour--22 minutes
or 20 calls per hour at 2 minutes each

10 second speed of answer
2 minutes on a call at 99.5 CCS requires 6 positions

5 second speed of answer
2 minutes on a call at 99.5 CCS requires 6 positions

There are 36,430 more subscribers projected for January 1, 1978,
than appeared on the proposal in 1974. These figures come from a
"Growth Factor Report" issued yearly by MBT engineers.

It is estimated at that time, with the projected increase in sub-
scribers, six positions would be necessary to handle the traffic.

Several factors, such as speed of answer and work time per call,
must be considered, but in general with 5 or 10 second speed of
answer and 2 minute work time per call the following CCS totals
demand the following number of positions:

62 CCS--4 positions
89 CCS--5 positions
109 CCS--6 positions

APPENDIX D

DATA COLLECTION, RETRIEVAL AND

INTERRELATIONSHIPS

DATA COLLECTION, RETRIEVAL AND INTERRELATIONSHIPS

The following pages contain notes and ideas obtained through interviews with various members of the Lansing Police Department in attempting to identify data needs for the Computerized Records System. Three sections are presented. First is a Table of Reports. This list identifies the reports currently generated and reports that would be used if available on a timely basis.

Second is Retrievable Information. This section contains notes on the types of data that different divisions would like to have the capability to retrieve. This would provide assistance in work scheduling, resource allocation and follow up investigations. Also, it would assist daily clerical tasks.

The final section is Desired Interrelationships. This section outlines the interrelationships that different individuals and divisions have indicated would be of assistance in their work.

Titles of Reports

1. Warrant by Beat--Patrol
2. Clearance Summary of Offenses--Daily
3. Crime Summary--Daily
4. Stolen Vehicles--Outstanding
5. Property by Type--Value
6. Traffic Enforcement Monthly Summary
7. Property Value of Crime Type
8. Offenses Cleared by Age and Race of Person Arrested
9. Offenses Cleared--Monthly Report
10. Offenses by District Beat of Occurrence
11. Offenses by Time of Day
12. Robbery Evaluation According to Number Performed
13. Victim by Race and Sex
14. Crime Index Report by Location
15. Crime Index Report by Offense
16. Location of Offense
17. Report of Offenses Cleared
18. Return of Offenses Known to the Police--Monthly
19. Return of Offenses Known to the Police--Annual
20. Property by Type and Value
21. Monthly Return of Off
22. Larceny and U.D.A.A.--Amount vs. Value
23. Offense Types vs. Race of 18 Years and Older
24. Age and Sex of Arrested Persons Older > 18
25. Age, Sex and Race of Persons Arrested--Younger < 18
26. UCR--Annual Return of Persons Charged with Offenses
27. Juvenile Disposition Report
28. Police Interview Listing by Reporting Area
29. Police Interview Listing by Vehicle
30. Police Interview Listing by Name
31. Police Interview Listing by Juvenile

32. Youth Unit Work Load--Juvenile
33. Arrest by Patrol Beat by Original Charge
34. Arrest by Time of Day and Original Charge
35. Age, Sex and Race of Persons Arrested
36. Arrest by Bureaus, Divisions and Units--Monthly
37. Annual Return of Persons Charged--Yearly
38. Case Status Report
39. Conviction Report by Crime Type
40. Daily Incident Bulletin
41. Juveniles on File
42. Traffic Enforcement Summary (Monthly)
43. Beat Service Work Load
44. Car Number Work Load
45. Patrol Service Work Load
46. Radio Calls by Patrol Beat and Time of Day
47. Dispatch Analysis Unit and Location
48. Number of Accidents vs. Types (Monthly)
49. Comparative Totals on Accidents vs. Types
50. Personnel Leave of Absence Report
51. Man Day Utilization Report
52. Number of Calls per Hour, Day of Week--Monthly Report
53. Complainant Name Index.
54. FBI--Offenses Known to Police
55. Crime Index Report by Location
56. Crime Index Report by Offense

Retrievable InformationStolen Property

1. Have pawn shop lists compared to stolen property lists for similar types.
2. Have persons that are pawning property checked for criminal history and general intelligence. (Example: Suspect dope dealer would pawn stolen hot stuff.)
3. Have a complete listing of persons pawning property entered so as a descriptor of property, date and time can be retrieved at any time. Listing of Repeaters Name.

Fences

1. Known (name), location he works in, location he sells in, type of property he handles, persons he deals with.

General

1. Number and type of crime by area and district for a one year period, so that the date, time, case number and descriptors of property can be obtained when queried by crime time.
2. Given exact address: What type of crime has been committed there, including date, time, case number and description of property taken.
3. Given property description: What similar type of property was taken, including type (crime), date, location and case number.
4. Given a certain crime area where (example: B & E) are occurring, return of all known criminals in B & E's living or that have worked in that area.

5. List all departments or area confidential informants by number and officer's name. Include the type of information they have or can get (Example: B & E information, checks, etc.) and also by area the confidential has information in.

Investigations

1. Copy of criminal history of subject, including mug shot.
2. Specific: Crime, Time, Location, Suspects (known and unknown description)
M.O.: Vehicles, Victims (types), Trends (map analysis).
3. General Information on Known Criminals if they Change M.O. or Types of Crimes or Vehicles.
4. Current listing on paroled persons.
5. Daily arrest record print out, including name, charge (misdemeanor or felony).
6. Daily stolen property list: Description, Crime Involved and Case Number.
7. Daily analysis of known stolen property description as compared to the pawn shop listing.
8. Monthly conviction rate, name of judge, name of suspect, type of crime and sentence.
9. Analysis of M.O. of specific crimes.
10. Set up a vehicle index.
11. Set up a nickname index.
12. Set up an AKA index.
13. Known associates of known offenders.
14. Contact cards.

Investigations--Larceny Squad,
Includes Larceny From a
Building, Auto's and
UDAA's

1. Known larceny persons bulletin distributed to pawn shops and business establishments.
2. Larceny from building detectives interested in:
 - a. prior arrest records,
 - b. if larceny, was it a misdemeanor or felony,
 - c. conviction, sentences, fines, bonds and judges, prosecutors.
3. Larceny from auto's
 - a. M.O. files (including type of property or car parts taken),
 - b. known suspects file.
4. Known fence file
 - a. known stolen property used by fence--collated to type of property being taken.

Investigation--Management

1. Number of cases per man.
2. Type of cases per man.
3. Number of cases per man closed.
4. Type of cases per man closed.
5. Number closed per man by arrest.
6. Type of cases closed per man by arrest.
7. Number of cases closed per man by warrants.
8. Type of cases closed per man by warrants.
9. Current status of total case load per man.
10. Current status of total types of load per man.
11. Total conviction rate of cases closed per man.
12. Total conviction rate of types of cases closed per man.
13. Total case load of incident reports.
14. Total case load of assigned reports.
15. Total case load of unassigned reports.

16. Total value of stolen property.
17. Total value of recovered stolen property.
18. Total types of property stolen day, week, month, year.

Patrol

1. Total number of calls for service per district, time and shift and area.
2. Total number of self-initiated activity per unit, district, time, area and shift.
3. Busy paper work: leave days, vacations, on and off duty court, absence report, sick leave, daily roster assignments, overtime, comp time.

Helicopter Patrol

1. Need for all crimes and calls for service in progress, listed in descending order by reporting area (or smaller area), by time of day and by day of week. This report should be a summary report with an ideal turn around time of sixteen hours.
2. Define all crimes according to patrol suppressable and non-suppressable.
3. Need for a forecasting or prediction of calls and crime in progress reports.
4. Need for computer mapping for visual displays of patterns and trends.
5. Need to link crimes together by M.O. to assist in trends and patterns.
6. Need for an updated list of ATL's from last to current period.

Detention

1. Needs daily tally (arrest print out) on arrestees, type of crime and disposition.
2. Need to eliminate the arrest cards and other duplicative reports.
3. Need own terminal.
4. Need instant record check.

Desired InterrelationshipsRetirevable Information

1. All Personal Descriptors.
 - a. known offenders
 - b. named and unnamed suspects
 - c. contact cards
 - d. intelligence information
2. All M.O. descriptors
 - a. including everything performed by the offender, either physically and/or verbally
3. All physical evidence pertaining to each and every individual crime.
4. All descriptors of all property taken in all crimes.
5. Descriptors of all vehicles used in crimes.
6. Descriptors of type and classification of crime.
7. Descriptor of time of crime.
8. Descriptor of geographical area.
9. Descriptor of type of victim (person and/or real property).
10. Descriptors of all weapons and tools used in the commission of the crime.
11. Retrieve information of the above information, given a specific time period.
12. Descriptor of known suspected offenders (example: Intelligence Sources).
13. Descriptor of intelligence information
 - a. persons
 - b. places--fencing, dope
 - c. situations--sports events, pickpockets
 - d. property.
14. Correlation of all descriptors factors of each crime as compared to other similar crimes in order to establish a pattern or trend.

15. Correlate all offenses per crime category according to date, time, location of occurrence, reporting area, patrol district and complaint number.
16. Percentage of increase or decrease of Part 1 crimes per month and year.

Interrelationship of Data Files

1. Be able to, at any time, receive a complete list of all known robberies, burglaries, auto thefts, larcenies and rapists.
2. Be able to compare physical descriptors given: to suspect file and known offenders' files to obtain persons with similar physical descriptors.
3. Given M.O. descriptors--what a list of all crimes with similar M.O. and a list of all suspects or known offenders with similar M.O.
4. Given physical evidence at scene of crime--desire similar physical evidence left at other crimes.
5. Given physical descriptors--desire other similar crimes that were committed by someone with similar physical descriptors.
6. Given a reporting area--desire all crimes class committed there within a defined period of time--date--type of victim.
7. Given an address--desire all crimes committed there, including date, time, case number, and description of all property taken.
8. Given crime classification--desire location and time of crime on a daily, weekly, monthly, seasonal and yearly basis.
9. Given name of victim (person or business)--desire listing of all crimes (victim, the victim of) according to date and time.
10. Given descriptors pawned property--desire to know if property was stolen.
11. Given name of persons pawning property--desire to know if he is a known offender or suspect.
12. Given customer's name who pawned property--desire a list of the property he has pawned in a given period of time.
13. Given property descriptors--desire to know what other crimes, including date and location, that had similar property taken.

14. Given a reporting area and crime--desire a list of all known or suspected persons involved in that type of crime who are living in that area.

15. Given a reporting area and crime--desire a list of all contacts made for that date and time and reporting area.

16. Known offenders and suspects to known vehicles owned/driven by them to contact within reporting area to known crimes.

17. Known offenders and suspects to associates relative to contact information by reporting area--date--vehicles--time to known crimes.

18. All property taken is put into descriptors and correlated to pawn sheets and known non-serialized property. This relates to #10.

19. Type of crime by classification to type of target victim by age, race, and location.

20. Given the name of the person pawning property and the type of property pawned on a weekly basis (pawn sheet).

GENERAL CASE REPORT

LANSING POLICE DEPARTMENT

1. DATE/ TIME RECEIVED		2. NAME/ NATURE OF OFFENSE		3. NAME/ COMPLAINT NO.	
4. DATE REPORTED		5. NAME/ COMPLAINT NAME LAST FIRST MIDDLE		6. OFF/ FILE & DEPT. AREA	
7. DATE/ TIME REPORTED		8. LRA/ ADDRESS OF COMPLAINANT		9. SOC/ COMPLAINT NO.	
10. DATE/ TIME ARRIVAL		11. SEX/ RAC/ DOB/ PIN/		12. HOME PHONE BUS. PHONE	
13. DATE/ TIME COMPLETED		14. LOCATION OF INCIDENT		15. FLOOR ROOM	
16. NAME/ VICTIM'S NAME (FIRM NAME IF BUSINESS)		17. SEX/ RAC/ DOB/		18. HOME PHONE BUS. PHONE PIN/	
19. LRA/ ADDRESS OF VICTIM		20. FLOOR ROOM APT. NO.		21. SOC/ VICTIM'S S.S. NO.	
22. TYPE OF THEFT		23. PROPERTY DAMAGED		24. AMOUNT OF DAMAGE \$	
25. NAME/ NAME OF PERSON WHO DISCOVERED BODY (HOMICIDE) OR WITNESS		26. NAME/ WITNESS NAME		27. IF MORE THAN ONE WITNESS, USE NARRATIVE	
28. LRA/ HOME ADDRESS		29. LRA/ HOME ADDRESS		30. APT. NO.	
31. SEX/ RAC/ WOV/		32. SEX/ RAC/ WOV/		33. HOME PHONE BUS. PHONE	
34. DESCRIPTION OF OFFENDER		35. CLOTHING WORN - GET COMPLETE DESCRIPTION (USE SUPPLEMENT IF NECESSARY)		36. ARREST MADE ARREST NO.	
37. IF MORE THAN 2 OFFENDERS, USE SUPPLEMENT		38. TYPE OF LOCATION WHERE OCCURRED		39. ARREST MADE ARREST NO.	
39. TOOL OR WEAPON USED		40. TYPE OF LOCATION WHERE OCCURRED		41. SPECIFY	
42. UNUSUAL CHARACTERISTICS OF CRIME (TRADEMARK)		43. NAME OF LET. OR 10 NOTIFIED TIME		44. NAME OF LET. OR 10 NOTIFIED TIME	
45. VEHICLE FROM WHICH THEFT OCCURRED		46. OFFENDER'S VEH.		47. OTHER IDENTIFYING INFORMATION	
48. PROPERTY TAKEN (DESCRIBE IN NARRATIVE ALL PROPERTY TAKEN)		49. PROPERTY TAKEN (DESCRIBE IN NARRATIVE ALL PROPERTY TAKEN)		50. PROPERTY TAKEN (DESCRIBE IN NARRATIVE ALL PROPERTY TAKEN)	
51. COMPLAINT RECEIVED		52. NARRATIVE (GIVE DESCRIPTION OF HOW CRIME WAS COMMITTED)		53. EXTRA COPIES REQUIRED (IND. & RECIPIENT)	
54. STAT. IDENT. ONLY (FLU. CL. UNFIN. NOT CL. CR)		55. IF FURTHER POLICE ACTION REQUIRED		56. IF CASE IS CLEARED, HOW CLEARED (USE THIS BOX FOR SINGLE CLEAR UP OR FIRST CLEAR UP OF MULTIPLE CLEAR UP LIST)	
57. LEIN NO. 48. SENT DATE TIME		59. CANCELLED DATE TIME		60. COMPLAINT REFUSED TO PROSECUTE	
61. REPORTING OFFICER		62. REPORTING OFFICER		63. SUPERVISOR APPROVING	
64. REPORTING OFFICER		65. REPORTING OFFICER		66. SUPERVISOR APPROVING	

RECORDS

CRIME AGAINST PERSON CASE REPORT										LANSING POLICE DEPARTMENT																			
1. DATE OF OCCURRENCE					2. NAME OF SUSPECT					3. RELATIONSHIP					4. INCIDENT NO. / WOVI / SOCA / COMPLAINT NO.														
5. DATE REPORTED					6. NAME / COMPLAINT NAME					7. OFF / FILE					8. DSP / AREA														
9. DATE OF INCIDENT					10. LRA / ADDRESS OF SUSPECT					11. APT. NO.					12. SOC / VICTIM'S S. NO.														
13. DATE OF VAL					14. SEX / RAC / DOB / PIN / HOME PHONE					15. BUS. PHONE					16. FAX / OTHER PHONE														
17. DATE OF INCIDENT					18. LOCATION OF INCIDENT					19. FLOOR					20. ROOM														
21. NAME / VICTIM'S NAME										22. SEX / RAC / DOB / HOME PHONE					23. BUS. PHONE					24. WOVI / CAN IDENTIFY YES / NO									
25. LRA / ADDRESS OF VICTIM										26. FLOOR					27. ROOM					28. APT. NO. / PIN / SOC / VICTIM'S S. NO.									
29. NAME OF GUARDIAN OF VICTIM IF MINOR										30. SEX / RAC / DOB / HOME ADDRESS					31. APT. NO. / HOME PHONE					32. FAX / OTHER PHONE									
23. NAME / NAME OF PERSON WHO DISCOVERED BODY (INCIDENT) OR WITNESS										24. NAME / WITNESSES NAME										25. IF MORE THAN TWO WITNESSES, OFF. NARRATIVE									
26. LRA / HOME ADDRESS										27. APT. NO.					28. LRA / HOME ADDRESS										29. APT. NO.				
30. SEX / RAC / DOB / PIN / WOVI / CAN IDENTIFY YES / NO										31. SEX / RAC / DOB / PIN / WOVI / CAN IDENTIFY YES / NO										32. SEX / RAC / DOB / PIN / WOVI / CAN IDENTIFY YES / NO									
33. NAME OF FIRST OFFICER AT SCENE										34. BADGE NO.					35. HOME PHONE - WITNESS					36. HOME PHONE - WITNESS									
37. VICTIM'S OCCUPATION										38. CRIME LAB. NOTIFIED					39. EXACT LOCATION OF VICTIM ON PREMISES										40. YES / NO				
41. WEAPON / INSTRUMENT OR MEANS OF ATTACK										42. HOW MEANS OF ATTACK USED										43. IF VICTIM NOT IDENTIFIED, STATE WHERE									
44. NATURE OF INJURY AND LOCATION ON BODY																													
45. EXACT WORDS USED BY OFFENDER																													
46. OFFENDER'S VEH. YEAR MAKE BODY STYLE COLOR LICENSE NO. STATE YEAR OTHER IDENTIFYING INFORMATION																													
47. USED BY / STOLEN										48. ACCUSED NO. 1										49. ACCUSED NO. 2									
50. ACCUSED NO. 3										51. SOC. SEC. NO.										52. ACCUSED NO. 4									
53. PHOTOGRAPHS TAKEN BY										54. TIME ARRIVED										55. ACCUSED NO. 5									
56. NO. OF OFFENDERS										57. SEX / RACE / AGE / HEIGHT / WEIGHT / HAIR / EYES / COMP. / CLOTHING WORN - GET COMPLETE DESCRIPTION LINE										58. COMPLEMENTARY DESCRIPTION									
59. MORE THAN 3 OFFENDERS USE NAME NARRATIVE										60. 1. ARREST MADE YES / NO										61. 2. ARREST MADE YES / NO									
62. 3. ARREST MADE YES / NO										63. 4. ARREST MADE YES / NO										64. 5. ARREST MADE YES / NO									
65. COMPLAINT RECEIVED										66. RMK / NARRATIVE: (GIVE DESCRIPTION OF HOW CRIME WAS COMMITTED. RECORD CHARACTERISTICS OF SUSPECT ON SUPPLEMENT)										67. 6. ARREST MADE YES / NO									
68. 1. RACID 2. PERSON 3. Y 4. P.O.P.										69. 5. NIGHT 6. OTHER (EXPLAIN)										70. 7. ARREST MADE YES / NO									
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491. NAME OF DET. OR AG. NOTIFIED										492. TIME										493. EXTRA COPIES MAILED NO. & RECIPIENT									
494. NAME OF DET. OR AG. NOTIFIED										495. TIME										496. EXTRA COPIES MAILED NO. & RECI									

BURGLARY OR ROBBERY CASE REPORT

LANSING POLICE DEPARTMENT

1. DATE REPORTED		2. TIME		3. SUSPECT NAME		4. FIRST		5. MIDDLE		6. LAST	
7. DATE DISPATCHED		8. TIME		9. POLICE OFFICER'S NAME		10. APT. NO.		11. CITY		12. STATE	
13. DATE ARRIVAL		14. ME		15. SEX		16. RACE		17. HOME PHONE		18. BUS. PHONE	
19. DATE COMP. BY		20. ME		21. EDUCATION OF INCIDENT		22. FLOOR		23. ROOM		24. APT. NO.	
25. NAME / VICTIM'S NAME (TEAM NAME IF BUSINESS)		26. SEX / RAC / DOB		27. HOME PHONE		28. BUS. PHONE		29. YES		30. NO	
31. LSA / ADDRESS OF VICTIM		32. PERS. INFO		33. APT. NO.		34. SEC. NO.		35. HOSPITALIZED		36. HOW / REASON FOR STOP	
37. AND DISC. ENT		38. ADDRESS		39. SEX		40. RACE		41. G.O.B.		42. HOME PHONE	
43. OFFENSE CLASSIFICATION (SEE SQUARE MUST BE CHECKED)		44. UNLAWFUL ENTRY		45. ATTEMPTED		46. ATTEMPTED ROBBERY		47. ATTEMPTED STRIKE		48. PERIOD OF DAY OCCURRED	
49. TYPE OF PREMISES		50. TYPE OF PREMISES		51. TYPE OF PREMISES		52. TYPE OF PREMISES		53. TYPE OF PREMISES		54. TYPE OF PREMISES	
55. NAME / WITNESS NAME		56. SEX / RAC / DOB		57. HOME PHONE		58. BUS. PHONE		59. YES		60. NO	
61. LSA / WITNESS ADDRESS		62. PERS. INFO		63. APT. NO.		64. SEC. NO.		65. HOSPITALIZED		66. HOW / REASON FOR STOP	
67. TOOLS USED IN MAKING ENTRY		68. POINT OF ENTRY (EXAMPLE: FRONT DOOR, BACK DOOR)		69. POINT OF ENTRY (EXAMPLE: FRONT DOOR)		70. POINT OF ENTRY (EXAMPLE: FRONT DOOR)		71. POINT OF ENTRY (EXAMPLE: FRONT DOOR)		72. POINT OF ENTRY (EXAMPLE: FRONT DOOR)	
73. INDIVIDUAL CHARACTERISTICS OF CRIME (TRADEMARK)		74. IF DATE BUREAU AND METHOD USED		75. IF DATE BUREAU AND METHOD USED		76. IF DATE BUREAU AND METHOD USED		77. IF DATE BUREAU AND METHOD USED		78. IF DATE BUREAU AND METHOD USED	
79. IF REQUIRED, NUMBER OF OCCUPANTS AT TIME OF BURGLARY		80. IF DATE BUREAU AND METHOD USED		81. IF DATE BUREAU AND METHOD USED		82. IF DATE BUREAU AND METHOD USED		83. IF DATE BUREAU AND METHOD USED		84. IF DATE BUREAU AND METHOD USED	
85. IF DATE BUREAU AND METHOD USED		86. IF DATE BUREAU AND METHOD USED		87. IF DATE BUREAU AND METHOD USED		88. IF DATE BUREAU AND METHOD USED		89. IF DATE BUREAU AND METHOD USED		90. IF DATE BUREAU AND METHOD USED	
91. IF DATE BUREAU AND METHOD USED		92. IF DATE BUREAU AND METHOD USED		93. IF DATE BUREAU AND METHOD USED		94. IF DATE BUREAU AND METHOD USED		95. IF DATE BUREAU AND METHOD USED		96. IF DATE BUREAU AND METHOD USED	
97. IF DATE BUREAU AND METHOD USED		98. IF DATE BUREAU AND METHOD USED		99. IF DATE BUREAU AND METHOD USED		100. IF DATE BUREAU AND METHOD USED		101. IF DATE BUREAU AND METHOD USED		102. IF DATE BUREAU AND METHOD USED	

RECORDS

MISCELLANEOUS INCIDENT REPORT

LANSING POLICE DEPARTMENT

1. INCIDENT NO.		2. DATE REPORTED		3. NAME/ID		4. OFFICER'S NAME		5. DISPATCH NO.	
6. NAME/ID		7. NAME/ID		8. NAME/ID		9. NAME/ID		10. NAME/ID	
11. NAME/ID		12. NAME/ID		13. NAME/ID		14. NAME/ID		15. NAME/ID	
16. NAME/ID		17. NAME/ID		18. NAME/ID		19. NAME/ID		20. NAME/ID	
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26. NAME/ID		27. NAME/ID		28. NAME/ID		29. NAME/ID		30. NAME/ID	
31. NAME/ID		32. NAME/ID		33. NAME/ID		34. NAME/ID		35. NAME/ID	
36. NAME/ID		37. NAME/ID		38. NAME/ID		39. NAME/ID		40. NAME/ID	
41. NAME/ID		42. NAME/ID		43. NAME/ID		44. NAME/ID		45. NAME/ID	
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81. NAME/ID		82. NAME/ID		83. NAME/ID		84. NAME/ID		85. NAME/ID	
86. NAME/ID		87. NAME/ID		88. NAME/ID		89. NAME/ID		90. NAME/ID	
91. NAME/ID		92. NAME/ID		93. NAME/ID		94. NAME/ID		95. NAME/ID	
96. NAME/ID		97. NAME/ID		98. NAME/ID		99. NAME/ID		100. NAME/ID	

27. ACTION TAKEN: (DESCRIBE ACTION POLICE TOOK TO CORRECT THE SITUATION)

46. FILE NO.

28. OFFENDER'S SEX	29. YEAR	30. MAKE	31. BODY STYLE	32. COLOR	33. LICENSE NO.	34. STATE	35. YEAR	36. OTHER IDENTIFYING INFORMATION
1. ☐ MALE	1. ☐ 1980	1. ☐ FORD	1. ☐ SEDAN	1. ☐ BLACK	1. ☐ 123456789	1. ☐ MI	1. ☐ 1980	1. ☐ OTHER IDENTIFYING INFORMATION
2. ☐ FEMALE	2. ☐ 1981	2. ☐ CHEVROLET	2. ☐ COUPE	2. ☐ WHITE	2. ☐ 987654321	2. ☐ MI	2. ☐ 1981	2. ☐ OTHER IDENTIFYING INFORMATION
3. ☐ MALE	3. ☐ 1982	3. ☐ DODGE	3. ☐ TRUCK	3. ☐ GREY	3. ☐ 567890123	3. ☐ MI	3. ☐ 1982	3. ☐ OTHER IDENTIFYING INFORMATION
4. ☐ FEMALE	4. ☐ 1983	4. ☐ BUICK	4. ☐ SEDAN	4. ☐ RED	4. ☐ 234567890	4. ☐ MI	4. ☐ 1983	4. ☐ OTHER IDENTIFYING INFORMATION
5. ☐ MALE	5. ☐ 1984	5. ☐ PONTIAC	5. ☐ COUPE	5. ☐ BLUE	5. ☐ 345678901	5. ☐ MI	5. ☐ 1984	5. ☐ OTHER IDENTIFYING INFORMATION
6. ☐ FEMALE	6. ☐ 1985	6. ☐ OLDSMOBILE	6. ☐ SEDAN	6. ☐ SILVER	6. ☐ 456789012	6. ☐ MI	6. ☐ 1985	6. ☐ OTHER IDENTIFYING INFORMATION
7. ☐ MALE	7. ☐ 1986	7. ☐ CHRYSLER	7. ☐ TRUCK	7. ☐ BROWN	7. ☐ 567890123	7. ☐ MI	7. ☐ 1986	7. ☐ OTHER IDENTIFYING INFORMATION
8. ☐ FEMALE	8. ☐ 1987	8. ☐ HONDA	8. ☐ COUPE	8. ☐ GREEN	8. ☐ 678901234	8. ☐ MI	8. ☐ 1987	8. ☐ OTHER IDENTIFYING INFORMATION
9. ☐ MALE	9. ☐ 1988	9. ☐ TOYOTA	9. ☐ SEDAN	9. ☐ BLACK	9. ☐ 789012345	9. ☐ MI	9. ☐ 1988	9. ☐ OTHER IDENTIFYING INFORMATION
10. ☐ FEMALE	10. ☐ 1989	10. ☐ SUBARU	10. ☐ TRUCK	10. ☐ WHITE	10. ☐ 890123456	10. ☐ MI	10. ☐ 1989	10. ☐ OTHER IDENTIFYING INFORMATION
11. ☐ MALE	11. ☐ 1990	11. ☐ NISSAN	11. ☐ COUPE	11. ☐ RED	11. ☐ 901234567	11. ☐ MI	11. ☐ 1990	11. ☐ OTHER IDENTIFYING INFORMATION
12. ☐ FEMALE	12. ☐ 1991	12. ☐ MAZDA	12. ☐ SEDAN	12. ☐ BLUE	12. ☐ 012345678	12. ☐ MI	12. ☐ 1991	12. ☐ OTHER IDENTIFYING INFORMATION
13. ☐ MALE	13. ☐ 1992	13. ☐ HYUNDAI	13. ☐ TRUCK	13. ☐ GREY	13. ☐ 123456789	13. ☐ MI	13. ☐ 1992	13. ☐ OTHER IDENTIFYING INFORMATION
14. ☐ FEMALE	14. ☐ 1993	14. ☐ KIA	14. ☐ COUPE	14. ☐ WHITE	14. ☐ 234567890	14. ☐ MI	14. ☐ 1993	14. ☐ OTHER IDENTIFYING INFORMATION
15. ☐ MALE	15. ☐ 1994	15. ☐ FORD	15. ☐ SEDAN	15. ☐ BLACK	15. ☐ 345678901	15. ☐ MI	15. ☐ 1994	15. ☐ OTHER IDENTIFYING INFORMATION
16. ☐ FEMALE	16. ☐ 1995	16. ☐ CHEVROLET	16. ☐ TRUCK	16. ☐ GREY	16. ☐ 456789012	16. ☐ MI	16. ☐ 1995	16. ☐ OTHER IDENTIFYING INFORMATION
17. ☐ MALE	17. ☐ 1996	17. ☐ DODGE	17. ☐ COUPE	17. ☐ WHITE	17. ☐ 567890123	17. ☐ MI	17. ☐ 1996	17. ☐ OTHER IDENTIFYING INFORMATION
18. ☐ FEMALE	18. ☐ 1997	18. ☐ BUICK	18. ☐ SEDAN	18. ☐ RED	18. ☐ 678901234	18. ☐ MI	18. ☐ 1997	18. ☐ OTHER IDENTIFYING INFORMATION
19. ☐ MALE	19. ☐ 1998	19. ☐ PONTIAC	19. ☐ TRUCK	19. ☐ BLUE	19. ☐ 789012345	19. ☐ MI	19. ☐ 1998	19. ☐ OTHER IDENTIFYING INFORMATION
20. ☐ FEMALE	20. ☐ 1999	20. ☐ OLDSMOBILE	20. ☐ COUPE	20. ☐ SILVER	20. ☐ 890123456	20. ☐ MI	20. ☐ 1999	20. ☐ OTHER IDENTIFYING INFORMATION
21. ☐ MALE	21. ☐ 2000	21. ☐ CHRYSLER	21. ☐ SEDAN	21. ☐ BROWN	21. ☐ 901234567	21. ☐ MI	21. ☐ 2000	21. ☐ OTHER IDENTIFYING INFORMATION
22. ☐ FEMALE	22. ☐ 2001	22. ☐ HONDA	22. ☐ TRUCK	22. ☐ GREEN	22. ☐ 012345678	22. ☐ MI	22. ☐ 2001	22. ☐ OTHER IDENTIFYING INFORMATION
23. ☐ MALE	23. ☐ 2002	23. ☐ TOYOTA	23. ☐ COUPE	23. ☐ BLACK	23. ☐ 123456789	23. ☐ MI	23. ☐ 2002	23. ☐ OTHER IDENTIFYING INFORMATION
24. ☐ FEMALE	24. ☐ 2003	24. ☐ SUBARU	24. ☐ SEDAN	24. ☐ WHITE	24. ☐ 234567890	24. ☐ MI	24. ☐ 2003	24. ☐ OTHER IDENTIFYING INFORMATION
25. ☐ MALE	25. ☐ 2004	25. ☐ NISSAN	25. ☐ TRUCK	25. ☐ GREY	25. ☐ 345678901	25. ☐ MI	25. ☐ 2004	25. ☐ OTHER IDENTIFYING INFORMATION
26. ☐ FEMALE	26. ☐ 2005	26. ☐ MAZDA	26. ☐ COUPE	26. ☐ RED	26. ☐ 456789012	26. ☐ MI	26. ☐ 2005	26. ☐ OTHER IDENTIFYING INFORMATION
27. ☐ MALE	27. ☐ 2006	27. ☐ HYUNDAI	27. ☐ SEDAN	27. ☐ BLUE	27. ☐ 567890123	27. ☐ MI	27. ☐ 2006	27. ☐ OTHER IDENTIFYING INFORMATION
28. ☐ FEMALE	28. ☐ 2007	28. ☐ KIA	28. ☐ TRUCK	28. ☐ WHITE	28. ☐ 678901234	28. ☐ MI	28. ☐ 2007	28. ☐ OTHER IDENTIFYING INFORMATION
29. ☐ MALE	29. ☐ 2008	29. ☐ FORD	29. ☐ COUPE	29. ☐ BLACK	29. ☐ 789012345	29. ☐ MI	29. ☐ 2008	29. ☐ OTHER IDENTIFYING INFORMATION
30. ☐ FEMALE	30. ☐ 2009	30. ☐ CHEVROLET	30. ☐ SEDAN	30. ☐ GREY	30. ☐ 890123456	30. ☐ MI	30. ☐ 2009	30. ☐ OTHER IDENTIFYING INFORMATION
31. ☐ MALE	31. ☐ 2010	31. ☐ DODGE	31. ☐ TRUCK	31. ☐ WHITE	31. ☐ 901234567	31. ☐ MI	31. ☐ 2010	31. ☐ OTHER IDENTIFYING INFORMATION
32. ☐ FEMALE	32. ☐ 2011	32. ☐ BUICK	32. ☐ COUPE	32. ☐ RED	32. ☐ 012345678	32. ☐ MI	32. ☐ 2011	32. ☐ OTHER IDENTIFYING INFORMATION
33. ☐ MALE	33. ☐ 2012	33. ☐ PONTIAC	33. ☐ SEDAN	33. ☐ BLUE	33. ☐ 123456789	33. ☐ MI	33. ☐ 2012	33. ☐ OTHER IDENTIFYING INFORMATION
34. ☐ FEMALE	34. ☐ 2013	34. ☐ OLDSMOBILE	34. ☐ TRUCK	34. ☐ SILVER	34. ☐ 234567890	34. ☐ MI	34. ☐ 2013	34. ☐ OTHER IDENTIFYING INFORMATION
35. ☐ MALE	35. ☐ 2014	35. ☐ CHRYSLER	35. ☐ COUPE	35. ☐ BROWN	35. ☐ 345678901	35. ☐ MI	35. ☐ 2014	35. ☐ OTHER IDENTIFYING INFORMATION
36. ☐ FEMALE	36. ☐ 2015	36. ☐ HONDA	36. ☐ SEDAN	36. ☐ GREEN	36. ☐ 456789012	36. ☐ MI	36. ☐ 2015	36. ☐ OTHER IDENTIFYING INFORMATION
37. ☐ MALE	37. ☐ 2016	37. ☐ TOYOTA	37. ☐ TRUCK	37. ☐ BLACK	37. ☐ 567890123	37. ☐ MI	37. ☐ 2016	37. ☐ OTHER IDENTIFYING INFORMATION
38. ☐ FEMALE	38. ☐ 2017	38. ☐ SUBARU	38. ☐ COUPE	38. ☐ WHITE	38. ☐ 678901234	38. ☐ MI	38. ☐ 2017	38. ☐ OTHER IDENTIFYING INFORMATION
39. ☐ MALE	39. ☐ 2018	39. ☐ NISSAN	39. ☐ SEDAN	39. ☐ GREY	39. ☐ 789012345	39. ☐ MI	39. ☐ 2018	39. ☐ OTHER IDENTIFYING INFORMATION
40. ☐ FEMALE	40. ☐ 2019	40. ☐ MAZDA	40. ☐ TRUCK	40. ☐ RED	40. ☐ 890123456	40. ☐ MI	40. ☐ 2019	40. ☐ OTHER IDENTIFYING INFORMATION
41. ☐ MALE	41. ☐ 2020	41. ☐ HYUNDAI	41. ☐ COUPE	41. ☐ BLUE	41. ☐ 901234567	41. ☐ MI	41. ☐ 2020	41. ☐ OTHER IDENTIFYING INFORMATION
42. ☐ FEMALE	42. ☐ 2021	42. ☐ KIA	42. ☐ SEDAN	42. ☐ WHITE	42. ☐ 012345678	42. ☐ MI	42. ☐ 2021	42. ☐ OTHER IDENTIFYING INFORMATION
43. ☐ MALE	43. ☐ 2022	43. ☐ FORD	43. ☐ TRUCK	43. ☐ GREY	43. ☐ 123456789	43. ☐ MI	43. ☐ 2022	43. ☐ OTHER IDENTIFYING INFORMATION
44. ☐ FEMALE	44. ☐ 2023	44. ☐ CHEVROLET	44. ☐ COUPE	44. ☐ RED	44. ☐ 234567890	44. ☐ MI	44. ☐ 2023	44. ☐ OTHER IDENTIFYING INFORMATION
45. ☐ MALE	45. ☐ 2024	45. ☐ DODGE	45. ☐ SEDAN	45. ☐ BLUE	45. ☐ 345678901	45. ☐ MI	45. ☐ 2024	45. ☐ OTHER IDENTIFYING INFORMATION
46. ☐ FEMALE	46. ☐ 2025	46. ☐ BUICK	46. ☐ TRUCK	46. ☐ WHITE	46. ☐ 456789012	46. ☐ MI	46. ☐ 2025	46. ☐ OTHER IDENTIFYING INFORMATION
47. ☐ MALE	47. ☐ 2026	47. ☐ PONTIAC	47. ☐ COUPE	47. ☐ BLACK	47. ☐ 567890123	47. ☐ MI	47. ☐ 2026	47. ☐ OTHER IDENTIFYING INFORMATION
48. ☐ FEMALE	48. ☐ 2027	48. ☐ OLDSMOBILE	48. ☐ SEDAN	48. ☐ GREY	48. ☐ 678901234	48. ☐ MI	48. ☐ 2027	48. ☐ OTHER IDENTIFYING INFORMATION
49. ☐ MALE	49. ☐ 2028	49. ☐ CHRYSLER	49. ☐ TRUCK	49. ☐ RED	49. ☐ 789012345	49. ☐ MI	49. ☐ 2028	49. ☐ OTHER IDENTIFYING INFORMATION
50. ☐ FEMALE	50. ☐ 2029	50. ☐ HONDA	50. ☐ COUPE	50. ☐ BLUE	50. ☐ 890123456	50. ☐ MI	50. ☐ 2029	50. ☐ OTHER IDENTIFYING INFORMATION
51. ☐ MALE	51. ☐ 2030	51. ☐ TOYOTA	51. ☐ SEDAN	51. ☐ WHITE	51. ☐ 901234567	51. ☐ MI	51. ☐ 2030	51. ☐ OTHER IDENTIFYING INFORMATION
52. ☐ FEMALE	52. ☐ 2031	52. ☐ SUBARU	52. ☐ TRUCK	52. ☐ GREY	52. ☐ 012345678	52. ☐ MI	52. ☐ 2031	52. ☐ OTHER IDENTIFYING INFORMATION
53. ☐ MALE	53. ☐ 2032	53. ☐ NISSAN	53. ☐ COUPE	53. ☐ RED	53. ☐ 123456789	53. ☐ MI	53. ☐ 2032	53. ☐ OTHER IDENTIFYING INFORMATION
54. ☐ FEMALE	54. ☐ 2033	54. ☐ MAZDA	54. ☐ SEDAN	54. ☐ BLUE	54. ☐ 234567890	54. ☐ MI	54. ☐ 2033	54. ☐ OTHER IDENTIFYING INFORMATION
55. ☐ MALE	55. ☐ 2034	55. ☐ HYUNDAI	55. ☐ TRUCK	55. ☐ WHITE	55. ☐ 345678901	55. ☐ MI	55. ☐ 2034	55. ☐ OTHER IDENTIFYING INFORMATION
56. ☐ FEMALE	56. ☐ 2035	56. ☐ KIA	56. ☐ COUPE	56. ☐ BLACK	56. ☐ 456789012	56. ☐ MI	56. ☐ 2035	56. ☐ OTHER IDENTIFYING INFORMATION
57. ☐ MALE	57. ☐ 2036	57. ☐ FORD	57. ☐ SEDAN	57. ☐ GREY	57. ☐ 567890123	57. ☐ MI	57. ☐ 2036	57. ☐ OTHER IDENTIFYING INFORMATION
58. ☐ FEMALE	58. ☐ 2037	58. ☐ CHEVROLET	58. ☐ TRUCK	58. ☐ RED	58. ☐ 678901234	58. ☐ MI	58. ☐ 2037	58. ☐ OTHER IDENTIFYING INFORMATION
59. ☐ MALE	59. ☐ 2038	59. ☐ DODGE	59. ☐ COUPE	59. ☐ BLUE	59. ☐ 789012345	59. ☐ MI	59. ☐ 2038	59. ☐ OTHER IDENTIFYING INFORMATION
60. ☐ FEMALE	60. ☐ 2039	60. ☐ BUICK	60. ☐ SEDAN	60. ☐ WHITE	60. ☐ 890123			

WORTHLESS DOCUMENT CASE REPORT

LANSING POLICE DEPARTMENT

1. DATE RECEIVED		2. NAME		3. NAME		4. NAME	
5. NAME		6. NAME		7. NAME		8. NAME	
9. DATE OF INCIDENT		10. LRA / ADDRESS OF COMPLAINT		11. DATE RECEIVED		12. DATE RECEIVED	
13. SEX / RAC / DOB		14. SEX / RAC / DOB		15. SEX / RAC / DOB		16. SEX / RAC / DOB	
17. DATE RECEIVED		18. DATE RECEIVED		19. DATE RECEIVED		20. DATE RECEIVED	
21. NAME / STREET NAME (IF ANY) (IF BUSINESS)		22. NAME / STREET NAME (IF ANY) (IF BUSINESS)		23. NAME / STREET NAME (IF ANY) (IF BUSINESS)		24. NAME / STREET NAME (IF ANY) (IF BUSINESS)	
25. LRA / ADDRESS OF VICTIM		26. LRA / ADDRESS OF VICTIM		27. LRA / ADDRESS OF VICTIM		28. LRA / ADDRESS OF VICTIM	
29. TYPE OF CHECK		30. TYPE OF CHECK		31. TYPE OF CHECK		32. TYPE OF CHECK	
33. SIGNED BY		34. PAYABLE TO		35. ENDORSED BY		36. ENDORSED BY	
37. METHOD OF PREPARING		38. METHOD OF PREPARING		39. METHOD OF PREPARING		40. METHOD OF PREPARING	
41. BANK NAME - BRANCH OFFICE (IF ANY) (IF BUSINESS)		42. BANK NAME - BRANCH OFFICE (IF ANY) (IF BUSINESS)		43. BANK NAME - BRANCH OFFICE (IF ANY) (IF BUSINESS)		44. BANK NAME - BRANCH OFFICE (IF ANY) (IF BUSINESS)	
45. BODY STYLE COLOR		46. BODY STYLE COLOR		47. BODY STYLE COLOR		48. BODY STYLE COLOR	
49. LICENSE NO.		50. LICENSE NO.		51. LICENSE NO.		52. LICENSE NO.	
53. STATE		54. STATE		55. STATE		56. STATE	
57. OTHER IDENTIFYING INFORMATION		58. OTHER IDENTIFYING INFORMATION		59. OTHER IDENTIFYING INFORMATION		60. OTHER IDENTIFYING INFORMATION	
61. NAME / STREET NAME (IF ANY) (IF BUSINESS)		62. NAME / STREET NAME (IF ANY) (IF BUSINESS)		63. NAME / STREET NAME (IF ANY) (IF BUSINESS)		64. NAME / STREET NAME (IF ANY) (IF BUSINESS)	
65. LRA / ADDRESS OF VICTIM		66. LRA / ADDRESS OF VICTIM		67. LRA / ADDRESS OF VICTIM		68. LRA / ADDRESS OF VICTIM	
69. TYPE OF CHECK		70. TYPE OF CHECK		71. TYPE OF CHECK		72. TYPE OF CHECK	
73. SIGNED BY		74. PAYABLE TO		75. ENDORSED BY		76. ENDORSED BY	
77. METHOD OF PREPARING		78. METHOD OF PREPARING		79. METHOD OF PREPARING		80. METHOD OF PREPARING	
81. BANK NAME - BRANCH OFFICE (IF ANY) (IF BUSINESS)		82. BANK NAME - BRANCH OFFICE (IF ANY) (IF BUSINESS)		83. BANK NAME - BRANCH OFFICE (IF ANY) (IF BUSINESS)		84. BANK NAME - BRANCH OFFICE (IF ANY) (IF BUSINESS)	
85. BODY STYLE COLOR		86. BODY STYLE COLOR		87. BODY STYLE COLOR		88. BODY STYLE COLOR	
89. LICENSE NO.		90. LICENSE NO.		91. LICENSE NO.		92. LICENSE NO.	
93. STATE		94. STATE		95. STATE		96. STATE	
97. OTHER IDENTIFYING INFORMATION		98. OTHER IDENTIFYING INFORMATION		99. OTHER IDENTIFYING INFORMATION		100. OTHER IDENTIFYING INFORMATION	

RECORDS

PAGE _____ OF _____ PAGES

LANSING POLICE DEPARTMENT

OCA

STOLEN PROPERTY REPORT

SER/ Serial Number No dashes, commas, blank spaces.

Boat Motor, T.V., Tapeplayer, etc.

ENTER ARTICLE

Make Motorola, Zenith, etc.

19 Inch TV, etc. (Dollars Only)

-Record a Bicycle
as an article

MAK/

MOD/Mod.No., Name, Desc. VAL/Value

SER/ Serial Number No dashes, commas, blank spaces.

Boat Motor, T.V., Tapeplayer, etc.

ENTER ARTICLE

Make Motorola, Zenith, etc.

19 Inch TV, etc. (Dollars Only)

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ENTER ARTICLE

Make Motorola, Zenith, etc.

19 Inch TV, etc. (Dollars Only)

MAK/

MOD/Mod.No., Name, Desc. VAL/Value

SER/ Serial Number No dashes, commas, blank spaces.

Winchester, Remington, etc.

ENTER GUN

30', 30', .38, 12 Gauge, etc.

MAK/Make

CAL/

TYP/Type G

Group 1

Group 2

Group 1 SUB MACHINE GUN (B)

Group 2

AUTOMATIC

BLANK PISTOL (A)

SEMI-ACTION

LEVER ACTION

CARBINE

MACHINE

PUMP

DOUBLE BARREL (E)

ANTIQUE (G)

FLAKE GUN

RIFLE

SHOTGUN

TARGAS

OTHER (D)

JET PROPELLED GUN

RMK/ REMARKS NON-SERIALIZED ITEMS

RECORDS

MISSING PERSON AND RUNAWAY CASE REPORT				LANSING POLICE DEPARTMENT			
1. DAY/DATE DECLARED		2. NAR/NATURE OF INCIDENT		3. RELATIONSHIP		4. INCA	
5. NAME/CLERK LAST NAME		6. NAME/CLERK FIRST		7. NAME/CLERK MIDDLE		8. OFF/FILE	
9. LRA/ADDRESS OF COMPLAINANT		10. APT. NO.		11. SOC/		12. DSP/	
13. SEX/ RAC/ DOB/		14. HOME PHONE		15. BUS. PHONE-OTHER		16. PIN/	
17. NAM/MISSING PERSON'S NAME		18. HOME PHONE		19. BUS. PHONE-OTHER		20. SOC/	
21. LRA/ADDRESS OF MISSING PERSON		22. FLOOR		23. ROOM		24. APT. NO.	
25. LRO/		26. WHERE EMPLOYED		27. HOME PHONE		28. BUS. PHONE-OTHER	
29. CLASSED		30. HGT/		31. WGT/		32. EYE/	
33. HAIR/		34. HOW WORK		35. COMPLETION		36. BUILD	
37. PHOTO AVAILABLE - ATTACHED		38. YES		39. NO		40. VSM/	
41. TATUOS - SCARS - AMPUTATIONS (DESCRIBE) CONTINUE IN RMK		42. YES		43. NO		44. YES	
45. NO		46. NO		47. YES		48. NO	
49. 5. NO CAL. APPLIANCES - BRACE - TR. SS - CANE - ETC.		50. CONDITION OF TEETH (DESCRIBE UNUSUAL DENTAL CONDITIONS)		51. YES		52. NO	
53. CLOTHING WORN - GET COMPLETE DESCRIPTION (SEE INSTRUCTIONS)		54. YES		55. NO		56. YES	
57. NO		58. YES		59. NO		60. YES	
61. NO		62. YES		63. NO		64. YES	
65. NO		66. YES		67. NO		68. YES	
69. NO		70. YES		71. NO		72. YES	
73. NO		74. YES		75. NO		76. YES	
77. NO		78. YES		79. NO		80. YES	
81. NO		82. YES		83. NO		84. YES	
85. NO		86. YES		87. NO		88. YES	
89. NO		90. YES		91. NO		92. YES	
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101. NO		102. YES		103. NO		104. YES	
105. NO		106. YES		107. NO		108. YES	
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113. NO		114. YES		115. NO		116. YES	
117. NO		118. YES		119. NO		120. YES	
121. NO		122. YES		123. NO		124. YES	
125. NO		126. YES		127. NO		128. YES	
129. NO		130. YES		131. NO		132. YES	
133. NO		134. YES		135. NO		136. YES	
137. NO		138. YES		139. NO		140. YES	
141. NO		142. YES		143. NO		144. YES	
145. NO		146. YES		147. NO		148. YES	
149. NO		150. YES		151. NO		152. YES	
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197. NO		198. YES		199. NO		200. YES	
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217. NO		218. YES		219. NO		220. YES	
221. NO		222. YES		223. NO		224. YES	
225. NO		226. YES		227. NO		228. YES	
229. NO		230. YES		231. NO		232. YES	
233. NO		234. YES		235. NO		236. YES	
237. NO		238. YES		239. NO		240. YES	
241. NO		242. YES		243. NO		244. YES	
245. NO		246. YES		247. NO		248. YES	
249. NO		250. YES		251. NO		252. YES	
253. NO		254. YES		255. NO		256. YES	
257. NO		258. YES		259. NO		260. YES	
261. NO		262. YES		263. NO		264. YES	
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277. NO		278. YES		279. NO		280. YES	
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285. NO		286. YES		287. NO		288. YES	
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353. NO		354. YES		355. NO		356. YES	
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369. NO		370. YES		371. NO		372. YES	
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417. NO		418. YES		419. NO		420. YES	
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457. NO		458. YES		459. NO		460. YES	
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681. NO		682. YES		683. NO		684. YES	
685. NO		686. YES		687. NO		688. YES	
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693. NO		694. YES		695. NO		696. YES	
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749. NO		750. YES		751. NO		752. YES	
753. NO		754. YES		755. NO		756. YES	
757. NO		758. YES		759. NO		760. YES	
761. NO		762. YES		763. NO		764. YES	
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