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PRC Public Management Services, Inc.

SYSTEM SURVEY REPORT

MINNEAPOLIS POLICE DEPARTMENT

LEAA REGION V

TECHNOLOGY TRANSFER PROJECT

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Section I

INTRODUCTION

PURPOSE

The purpose of this report is to sufficiently describe all the efforts and occurrences of a technology transfer project so that other interested agencies can understand its problems and successes. This report will describe the project as it occurred at the Minneapolis Police Department from grant application until the project was nominally concluded, on December 31, 1975. Included in the report are discussions of the efforts involved in planning, design, donor selection and implementation.

PROJECT DEFINITION

Because of the interest in information systems technology transfer, and because of the lack of information on the practical aspects of transfer, LEAA's Region V office undertook to design a project which would explore the feasibility of transfer, in a developmental setting, and to glean from this effort the kind of information which would be helpful to agencies considering the possibility of technology transfer.

Specifically, the project had two primary objectives:

- To transfer one or more criminal justice information system applications to each of the participating recipient agencies.
- To provide thorough documentation of the problems encountered, solutions to those problems, and recommendations that may benefit other agencies involved in the transfer process.

The six agencies selected as recipient sites were:

- Lake County Department of Management Services
Waukegan, Illinois
- Marion County Municipal Court
Indianapolis, Indiana

- Michigan Department of Corrections
Lansing, Michigan
- Minneapolis Police Department
Minneapolis, Minnesota
- Northwest Ohio Regional Information System
(NORIS) - Toledo, Ohio
- Wisconsin Division of Corrections
Madison, Wisconsin

The project was designed to consist of four phases:

- A system requirements analysis, where agency needs were assessed.
- A donor site selection phase, where alternative systems for transfer were selected.
- A technology transfer phase, during which the actual transfer of software took place.
- A documentation phase which lasted for the duration of the project and collected all available information on the process of technology transfer.

Two sites terminated their participation prior to completion of the project. The State of Wisconsin, for reasons not directly associated with the project, was unable to continue its participation. The Michigan Department of Corrections chose to terminate its involvement at the conclusion of the second phase.

The conditions under which the project would occur were minimal. As with any LEAA funded project, certain time constraints were involved. The project funding was not to include budgeting for any additional hardware requirements. The transfer was to consist of operational applications software written in COBOL.

While preliminary objectives of the site were stated in the Request for Proposal, the intent of the initial project phase was specifically to develop the information processing requirements of the site.

The report is presented in eight sections as shown below. It covers the site environment and experiences from the start of the project through to December 31, 1975, when, for the most part, the "lessons learned" were complete and documentable.

- I. INTRODUCTION
- II. MANAGEMENT SUMMARY
- III. DEFINITION OF TECHNOLOGY TRANSFER PROJECT
- IV. SURVEY OF SYSTEM AT PROJECT START
- V. DONOR SITE SELECTION
- VI. IMPLEMENTATION SCHEDULE AND PROCESS
- VII. MODIFICATION ANALYSIS
- VIII. SUMMARY OF TRANSFER EFFECTIVENESS

Section II

MANAGEMENT SUMMARY

ORIGINAL PROJECT GOALS

The original project goals as stated by the Law Enforcement Assistance Administration (LEAA) in the Request for Proposals for the Technology Transfer Project were:

- To transfer one or more criminal justice information system applications to each of the participating recipient agencies.
- To provide thorough documentation of the problems encountered, solutions to those problems and recommendations that may benefit other agencies involved in the transfer process.

While the LEAA's objectives were related to the question of feasibility of computer technology transfer, those of the Minneapolis Police Department dealt more directly with the specific needs of the agency. As originally stated, the goals of the MPD were:

- Provide all field personnel with timely and accurate information in the most usable manner possible.
- Provide all information within the parameters of privacy and security standards and record keeping standards established at the department, state, and national levels.
- Provide operational command and management staff with adequate data to significantly improve resource allocations in the effort to reduce crime and delinquency and increase the arrest and clearance rates.

Specific objectives to be achieved in reaching these were established.

The objectives were:

- Reduce the estimated 175 formal and informal documents that flow within the department by centralizing basic information into automated files.

- Reduce the storage space required by utilizing microform technology and establishing purge criteria standards.
- Provide an indexing system responsive to the needs for accessing automated, mechanical and manual systems which contain information on persons, events and operational data.
- Provide management level reports, system evaluation and statistics so that the emerging system can be monitored for effectiveness and utility.
- Provide the field personnel with access to information available within the criminal justice system for local, regional, state, or national systems.
- Provide the department with the capability for crime pattern analysis.

Four applications modules that would fulfill the information needs implied by the objectives were identified:

- Police Property Room Application
- Master Name/Location File
- Dangerous Address History File
- Calls-for-Service Management Application

This basic concept of a police information system was based partly on a limited conceptual design developed prior to the start of the Technology Transfer Project and partly on gross estimates of what was possible within the scope of the planned effort.

Essential planning and analysis tasks had not been performed prior to issuing the request for proposals to obtain contractor services for the Minneapolis Police Department Technology Transfer Project. As a consequence, the planning effort was conducted in parallel with the analysis of information needs and the determination of the automated functions to be acquired through transfer.

The Technology Transfer Project was conducted in three phases as follows:

- Phase I - REQUIREMENTS ANALYSIS
- Phase II - DONOR SELECTION
- Phase III - IMPLEMENTATION

In addition, Phase IV - DOCUMENTATION - was a concurrent task designed to capture the experiences and lessons of the project. It was the LEAA Region V office's desire to provide such information with recommendations to others to assist and enlighten during other technology transfer projects.

PHASE I - REQUIREMENTS ANALYSIS

The main thrust of Phase I was to identify and describe the Minneapolis Police Department's information needs and priorities for system development. The need for an information system master plan became evident during the planning process and action was taken to obtain grant funding through the State Planning Agency. The application was approved subject to final donor site selection and the identification of application modules to be implemented.

Phase I and Phase II overlapped to some extent during this period as the transfer team clarified its direction and sought a firm commitment from the MPD users to implement either a batch or on-line system. Meanwhile, the team acquired additional knowledge as to what applications were available for transfer and gained new insight into the implications of installing an automated system through contacts with potential donor sites. As a result, needs and priorities were reviewed and revised and selection criteria changed.

The MPD committed to the development of an on-line system in February 1975, but development time and cost factors were unacceptable and they reverted to a batch system concept. The leading candidate for transfer was determined not to be operational following an on-site visit. It was therefore eliminated and new selection criteria were developed.

This was a frustrating and confusing period for the transfer team because of the fluctuation of requirements and selection criteria and the apparent lack

of qualified transfer candidates. It should be noted that a major reason for the situation that existed was the almost total lack of planning in the form of information needs analysis and system concept prior to issuing the RFP.

Also contributing to the problem was the fact that project funds were held at the State level until the City fulfilled a requirement to develop an Affirmative Action Program and submit a plan for approval. The delay in release of funds to the City held up the hiring of a Project Director and staff. Until funds were released, a project staff was made available on an ad hoc basis.

Out of the initial effort to define requirements and select a donor, however, came a decision, based upon information gathered from personnel at potential donor sites, to implement a computer-assisted dispatch application. Since complaint information initiates the events that are of interest to the police, it was decided that the CAD was a logical function with which to begin automation. At this point Phase II was started.

PHASE II - DONOR SELECTION

A telephone survey followed by on-site visits to potential donor candidates reduced to two the number of CAD systems that were seriously considered. One, the Jacksonville (Florida) system was a proprietary program which was available for a \$5,000 purchase price. Its documentation was reported by another agency considering its use to be inadequate to support the transfer effort. The other system, that of Charlotte (North Carolina) was selected, partly because of its extensive documentation. Additionally, a question was raised as to whether the Jacksonville system would be in the public domain if it was transferred, but it was the status of the documentation that was of most concern. The Charlotte system was selected. A complete summary of the site survey activity is presented in Exhibit 5-1.

PHASE III - IMPLEMENTATION

A transfer of the Charlotte CAD system at the operational or "code" level was planned. The COBOL source code was utilized to the maximum extent

possible. The compatibility of the donor and recipient sites' computer systems favored the code level transfer. Some modifications to the system software (i.e., tape and telecommunications handlers) were necessary to allow system development and testing to be carried out on the City Data Processing Center computer. Provision was made for adding two terminals to the configuration to facilitate development and also to support a training program.

Major changes in system design were necessary in certain functional areas to accomodate geographic and organizational differences between the two sites. These are described in detail in Section VI, Implementation Schedule and Process.

Development of the geographic base file was the single most time-consuming task in the project. Programs were prepared to compare the DIME and city property files in order to identify the areas in need of updating and to extract the information necessary to compile the file. Also time-consuming was the coordination effort necessary to determine the status of the files and obtain decisions relative to its update.

Many of the problems encountered during the implementation came as a surprise to the transfer team because a comparison of the functional requirements of the Minneapolis Police Department with the capabilities of the Charlotte system had not been made. As a result, the team was constantly annoyed by the need to make program fixes (some significant and some not) that developed as the implementation, test, and training activities proceeded.

The system documentation that accompanied the Charlotte system was good. Deficiencies not recognized at the outset of the implementation phase were encountered as the team became more familiar with the content but the program narratives were especially useful. The fact that the most recent program changes were not reflected in the documentation was the cause of some inconvenience and the user's manual was found to be inadequate for use as a training tool. The manual was condensed into an Operations Handbook for training purposes.

The original plan for training was to train the trainers but time became a controlling factor and the plan was changed. Complaint clerks and dispatchers on a night shift were trained first, with the intention of transferring them to the day shift and operating the CAD on a single shift basis until the training program was completed. The trained dispatchers and complaint clerks were placed on separate shifts to fulfill an operational requirement, however, and the program was completed as an on-the-job training activity.

Final testing and training were conducted in parallel and both efforts benefited from the interaction between programmers and operational personnel, even though the program "bugs" were annoying to the trainers and the programmers were aggravated by the need to respond to the reported "errors".

The Minneapolis Police Department was without a computer of its own at the start of the project. During the implementation phase they acquired a Burroughs B4700 and peripheral equipment similar to that utilized by the City of Minneapolis. The two systems were ultimately installed in the same building to facilitate a backup capability and the CAD system was installed on the police computer.

CONCLUSIONS

The Minneapolis Police Department Technology Transfer Project was successfully concluded from the point of view of both the LEAA and the City of Minneapolis. The experiences of the Minneapolis Police Department, along with those of the other participating agencies, were documented for the benefit of others who may choose to apply technology transfer in the acquisition of an information processing system. The "Information Systems Technology Transfer Summary Report" presents the lessons learned through the experiences of the participants. The objectives of LEAA have therefore been met.

The project has resulted in two important benefits to the Minneapolis Police Department. First, it has established in the Department an automated information processing system that will serve as a catalyst for the introduction

of automation into other than the dispatch function and will stimulate the improvement of operations. Second, and perhaps most important, it has provided a learning experience that probably could be achieved in no other way. Whatever direction data processing systems may take in the Department, the lessons learned from technology transfer will serve as a foundation for their planning and development.

The major conclusions that can be derived from the experiences of the Minneapolis Police Department Technology Transfer Project are:

- *Development of an information system requires the early commitment and participation of the user.*
- *An analysis of the information needs and functional requirements of the user is an essential prerequisite to selecting a system for transfer.*
- *Careful comparison of user information needs and functional requirements with donor system outputs and functional capabilities is the key element of the selection process.*
- *Organizational and planning for technology transfer must consider the people as well as the technical aspects of the endeavor.*

Section III

DEFINITION OF TECHNOLOGY TRANSFER PROJECT

The Region V Technology Transfer Project was initiated early in 1974 by the Regional Office Systems Specialist. Program #6 of the Region V Discretionary Fund Handbook dealt with Computer Technology Transfer and \$1,200,000 had been budgeted for the program. The principle objective of Program #6 was the successful transfer of a criminal justice application program to a recipient site in each of the six Region V states. Based on their needs, recipient sites would receive operational programs and the technical assistance required to install and make them operational.

The six states of Region V were asked to participate in the project by selecting a recipient site within the prescribed criteria. The site selected for the State of Minnesota was the Minneapolis Police Department, Minneapolis (Minnesota).

Following site selections, the six recipients, SPA system specialists and LEAA personnel met, developed a tentative (but detailed) work plan and schedule, and generated on May 24, 1974, a Request for Proposal for Technical Assistance for a Computer Technology Transfer Program.

Although the RFP was generated by the LEAA Region V office under the direction of Mr. Frank N. Sass, Systems Specialist, the project management at that time had been placed under the control of the Advisory Committee of the Computer Technology Transfer Program. The Advisory Committee was composed of representatives of the six states' SPA offices, the six Project Directors, and Frank Sass.

Proposals were received and reviewed by the Committee and a contractor selected. A master contract was negotiated on July 9, 1974 with Public Systems inc. to provide the technical support to the six sites as outlined in their proposal work plan and subsequently by contractual agreement with the agencies themselves.

The project was funded by an LEAA Part C Discretionary Grant, requiring ten percent (10%) matching funds from the participating states. The grant was approved by LEAA Region V in June. However, funding was no longer available through the Region V LEAA office, and was then being granted directly from Washington, D.C. Approval for these funds by LEAA was not given until late October 1974. This placed a considerable strain on both the Minneapolis Police Department, which had been receiving services for some time, and the Contractor, Public Systems, and Subcontractor, CSC. The City of Minneapolis was, of course, unable to negotiate a contract with the contractor until after the funds were approved by LEAA.

Two basic goals had been generated: (1) to effectively transfer application modules to the site; and (2) to document the experiences as an aid to others. Beyond these general goals, the specific objectives were let to the sites themselves to develop in Phase I, Information Requirements Analysis.

WORK PLAN

A work plan had been developed in the contractor's proposal. The proposed plan was to conduct Phases I and II concurrently at all sites, so that the sites could benefit from the donor analysis conducted by others. However, because of considerable differences in the time frame under which final site contracts were negotiated this concept became impossible, and each site eventually renegotiated and proceeded with its own work plan. The Minneapolis Police Department work plan is presented as Appendix A.

Section IV

SURVEY OF SYSTEM AT PROJECT START

RESOURCES

The resources available to support the technology transfer project at the recipient site at the time the project was initiated are described below.

People/Organization

From August 1974 until March 1975, when a contract was finally executed for the services of contractor personnel, the project proceeded with a part-time interim staff that attempted, on an ad hoc basis, to establish system requirements. Workshop sessions were conducted with a committee comprised of the following:

Policy, Rules, Regulations	Chief of Police
Goals and Objectives	Deputy Chief
System Concept and Development Considerations	Planning and Research
Data Processing Requirements	MPD Interim Design Team

Following completion of contract negotiations, a full-time Project Coordinator was hired, staff consisting of two systems analysts and one programmer was obtained and the project organization stabilized as illustrated in Exhibit 4-1. Duties and responsibilities of the project staff are shown in Exhibit 4-2.

Equipment and Software

The status of the equipment and software available at the start of the project was as follows:

- Hardware

The Minneapolis City Data Processing facility consisted of a Burroughs 4700 computer system with

Exhibit 4-1

TECHNOLOGY TRANSFER ORGANIZATIONAL CHART

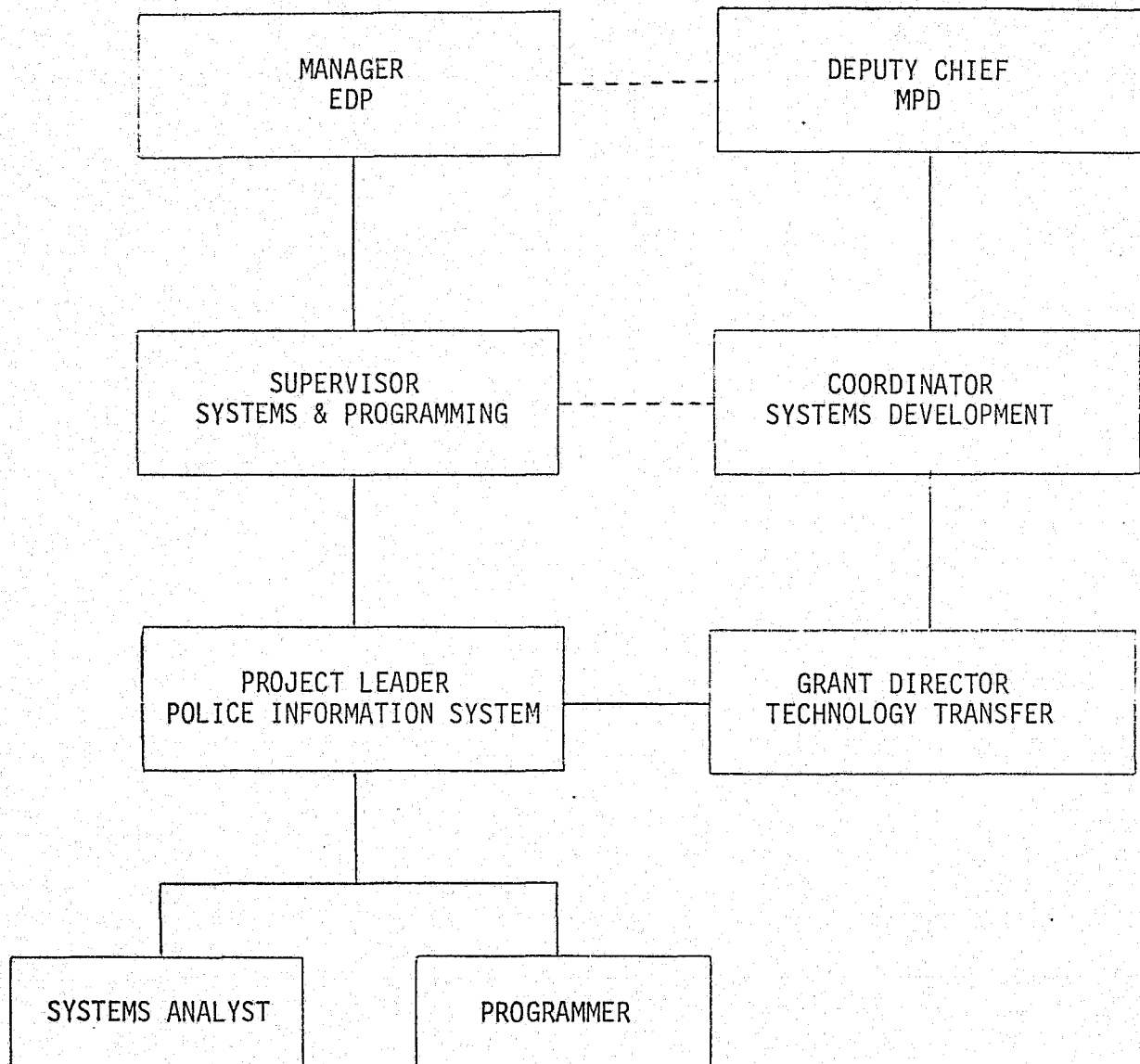


Exhibit 4-2

TASK ASSIGNMENTS FOR TECHNOLOGY TRANSFER

PROJECT DIRECTOR

- A. Acquire and allocate required resources
- B. Distribute workload
- C. Monitor performance
- D. Reporting of status
- E. Documentation of project

SYSTEMS ANALYST I

- A. Program conversion (get clean compiles of application programs and convert NDL)
- B. Test data file conversion
- C. JCL conversion
- D. Trouble-shooting (analyze all technical problems discovered)
- E. Testing and debugging of donor system and documentation (refer to Module Integration Test in Charlotte Document MIS-4302/016/01)
- F. Software modifications to user specs
- G. Testing of system to meet user specs

PROGRAMMER

- A. Interface with users for definition of software modifications
- B. Interface with users for definition of procedural modification to police communications
- C. Assist in software modifications
- D. Documentation of problems encountered and solutions for A and B

SYSTEMS ANALYST II

- A. Assist in training effort for users and management
- B. Analyze interfacing of CAD with total police Information System
- C. Document problems and solutions

nearly 400 million positions of disk storage. The existing hardware capability for telecommunications was 12 lines, each capable of handling 99 TP units. Only four lines were in use and were not being utilized to capacity.

Work being done for the Minneapolis Police Department when the project began constituted less than 1% of their total workload. The operations schedule was two shifts (16 hours) a day, Monday through Friday, and one eight-hour shift on Saturday.

The City data processing center was largely disk oriented. Some files were maintained on magnetic tape and loaded to disk for processing as required.

Standard Burroughs Utilities:

- BPL (Burroughs Program Language)
- RJE (Remote Job Entry)
- BASIC (improved)
- REPORTER
- ASSIST
- SOR/MERGE
- FORTRAN
- COBOL
- FORTE
- COFIRS
- TABS
- SPG

Note: The only major modified package is teleprocessing handling.

• Residence Requirements (Approximate)

MCP-V	35K bytes
COBOL:	17K bytes main memory, 190 K bytes of disk storage
COBOL-L:	30K bytes main memory, 240K bytes of disk storage
COBOL-V:	45K bytes main memory, only on the 4700 and 3700
FORTRAN:	27K bytes main memory, 200K bytes of disk storage, 340K bytes of working storage/1000 source program cards
BASIC:	Improve, two versions, storage not available
BPL:	

- Data Formats

Basic Unit: 16-bit word (plus parity bit)
Each word can hold two 8-bit bytes or four 4-bit BCD digits
Main storage addressable by digit positions

Fixed Point Operands: 1-100 decimal digits or bytes for most instructions
4-bit format can be assigned or unassigned
8-bit format is always unassigned

Floating Point Operands: 2-digit exponent
Fraction ranging from 1-100 decimal digits

Instructions: One to four 6-digit and/or 8-digit "syllables"
A single 2-digit "syllable" consisting of an op code only

Internal Code: EBCDIC, standard ASCII

- Processor

4700 Central Processor
Real Storage--300K bytes
Main memory cycle time 500 nanoseconds per 2-byte access
Processor cycling speed--4 million CPS

- Storage

Magnetic Tape Units--(B-9393-1) five 9-track, 1600 BPI
Dual-Drive Disk Racks--(B-9388-2), three, 129.5 million bytes
Disk Storage Units--(B-9372-7) two, 40 million bytes

- Other

Card Reader--(B-9112) one, 1400 CPM
Printers--(B-9243-1) one, 1100 LPM and (B-9240-4) one, 860 LMP

CRTs--Ten currently used

Ports--Twelve are available expandable to 36, each can handle one line.

• Software

The operating system at the Minneapolis Computer Center was Burroughs' MCP-V, an updated version of the Burroughs Master Control Program which provides considerably better throughput than older versions provided it is properly utilized.

MCP-V Master Control Program supervises and controls all of the system's operations. This program performs loading, interrupt processing, I/O control, priority selection, initiation of programs, I/O error processing, system log maintenance, printer backup, I/O spooling and dynamic storage allocation.

The telecommunications handler was modified in-house.

• General Comments

The Burroughs B4700 computer, operated by the City computer center, is noted for user oriented software and dynamic multiprogramming capabilities. The B4700 is completely program compatible with the smaller and earlier B2500 and B3500 series. Because of its expanded addressing structure and instruction repertoire, candidate systems which run on the smaller series as well as the larger B6700 series (and up) were considered as prime candidates for transfer.

• Compatibility

There is no object level program compatibility between the 4700 and larger "700" series systems. Burroughs provides a COBOL and FORTRAN "filter" that facilitates conversion of COBOL and FORTRAN from the larger systems to the 4700. ANS COBOL is accepted directly without the need for the "filter".

CONCEPTS

The conceptual design and the description of the application modules that the Minneapolis Police Department intended to transfer were actually developed months after the project started. (Exhibit 4-3, Data Flow Concept.)

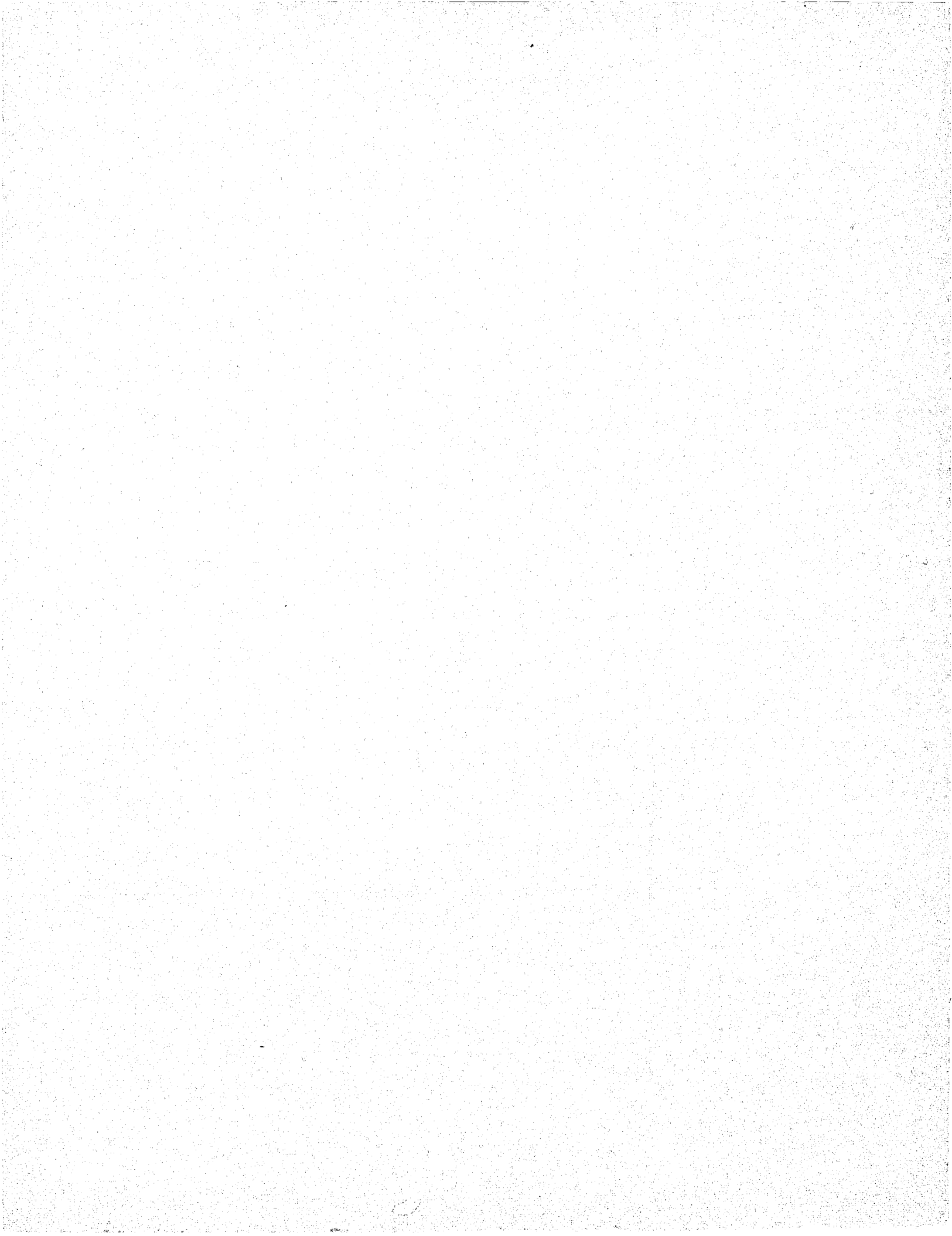
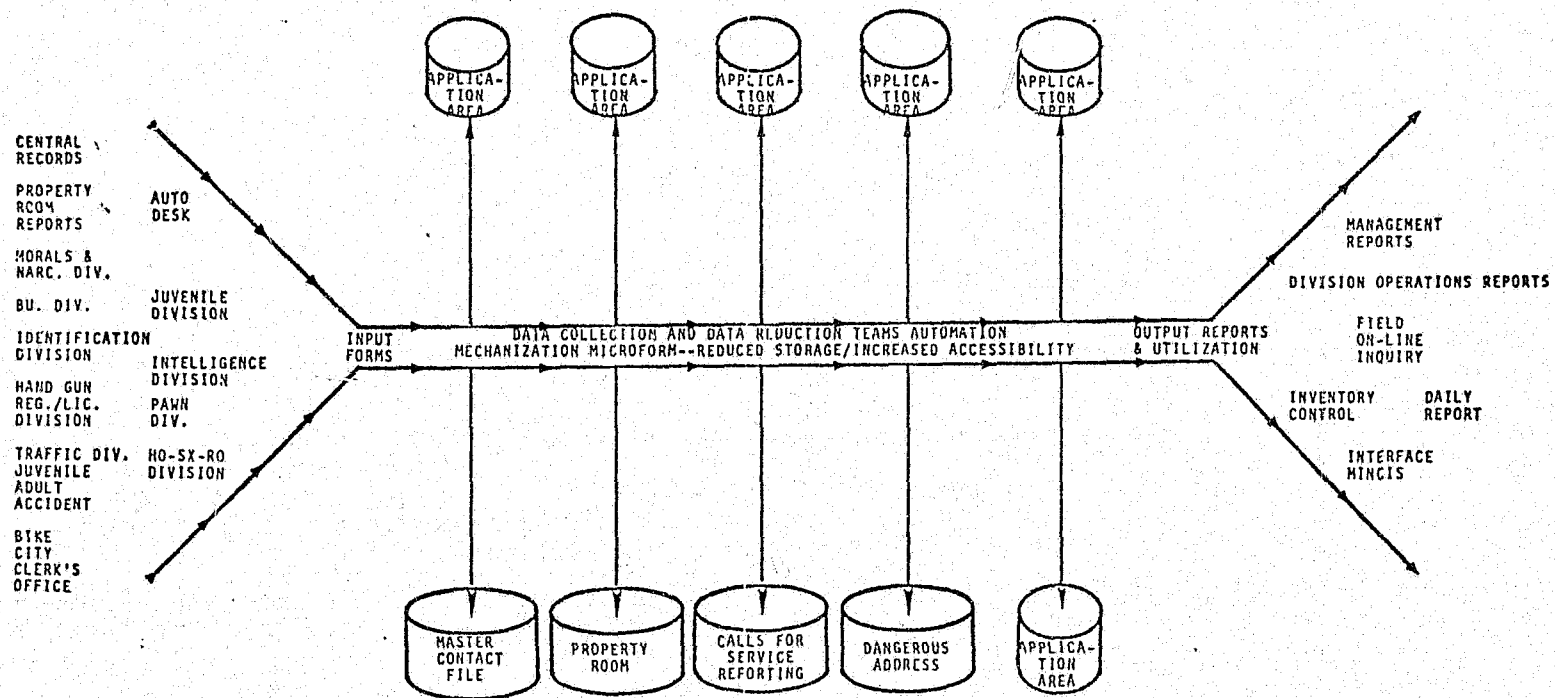


Exhibit 4-3

DATA FLOW CONCEPT



The original concept went through many iterations and changes. Concurrent with an effort to arrive at a description of the modules that would be required, the basic goals and objectives for the project were developed. They were:

Goals

- Provide all field personnel with timely and accurate information in the most usable manner possible.
- Provide all information within the parameters of privacy and security standards and record keeping standards established at the department, state, and national levels.
- Provide operational command and management staff with adequate data to significantly improve resource allocations in the effort to reduce crime and delinquency and increase the arrest and clearance rates.

Objectives

- Reduce the estimated 175 formal and informal documents that flow within the department by centralizing basic information into automated files.
- Reduce the storage space required by utilizing microform technology and establishing purge criteria standards.
- Provide an indexing system responsive to the needs for accessing automated, mechanical and manual systems which contain information on persons, events, and operational data.
- Provide management level reports, system evaluation and statistics so that the emerging system can be monitored for effectiveness and utility.
- Provide the field personnel with access to information available within the criminal justice system for local, regional, state, or national systems.
- Provide the department with the capability for crime pattern analysis.

Analysis of Requirements

The Minneapolis Police Department had identified several application modules that they felt would fulfill some of their information needs. The application modules were not defined beyond generic types of systems. It was anticipated that the applications would change significantly when the project got underway. This proved to be the case. The application modules as they appeared in the RFP are listed below.

- Police Property Room Application
- Master Name/Location File
- Dangerous Address History File
- Calls-for-Service Management Applications

Technology transfer was envisioned by the Minneapolis Police Department as a catalyst to bring about the implementation of a police information system.

The preliminary analysis revealed that there had been a limited amount of conceptual design for a Police Information System conducted prior to the start of the Technology Transfer Project. The program areas selected as modules for the Technology Transfer Project were to establish exact parameters for the overall system design. All modules developed subsequent to the transfer would, in fact, be developed within the requirements expressed in Technology Transfer. A maximum effort was expended to define the decision points, produce documents to authorize system development and identify major manual system deficiencies. The information system that would emerge from the Technology Transfer was expected to be operational for many years without major modifications. Development of additional modules by the Minneapolis Police Department staff would enhance the transferred system. A detailed analysis of MPD's information requirements was not accomplished.

The Minneapolis Police Department recognized that detailed planning would be required because this project would set the direction in automation, influence the redesign of the record keeping activities, and cause a major reorganization in the department structure and staffing. Considerations relative to the first goal of providing the officer-on-the-street with basic

operational information were mapped out. These considerations included: (1) strengthening the Fingerprint Division and Central Records Divisions: (2) liaison with the Sheriff's Office for booking data: (3) liaison with the County Data Processing for criminal record information of common interest; and (4) interface requirements.

In March 1975, a master plan effort to determine information needs and identify potential funding sources was initiated. SPA approval of the grant application was subject to the final selection of the donor site and identification of the applications to be fully implemented under this project by April 30, 1975. The conceptual design of the Minneapolis Police Department information system and approved implementation plan were due on the same target date.

Planning Documentation

Prior to the start of the Technology Transfer Project no planning documentation had been developed. The main thrust of Phase I was to identify and describe the Minneapolis Police Department's needs and priorities for systems development. In addition to the initiation of a master planning effort described above, the interim staff prepared "Articles for the Justice Information System" (Appendix B) and a "Job Description for the Police Information System Coordinator" (Appendix C). The Original Project Work Plan Schedule (Appendix A) had been prepared and submitted by the contractor as a basis for beginning the project.

Section V

DONOR SITE SELECTION

METHODOLOGY

The selection of a donor site centered around a list of potential donor candidates compiled from the LEAA inventory of criminal justice information systems, state master plan criminal justice information system inventories, and the personal knowledge of the transfer team. The Minneapolis Police Department had identified, in generic terms, several applications modules that they felt would at least partially fulfill their information needs. They were:

- Police Property Room Application
- Master Name/Location File
- Dangerous Address History File
- Calls-for-Service Management Applications

No distinction between batch and on-line applications was made at the beginning of the site selection. The MPD had not yet committed itself to an on-line system.

A telephone survey questionnaire was developed to facilitate the collection of complete and uniform data from each potential donor site. Telephone contacts were made by members of the technology transfer team, and the data collected was utilized to screen out those systems that did not meet the MPD requirements. Where it appeared that further examination of a particular system might prove useful, the team attempted to obtain existing documentation which was then assessed for completeness and accuracy. A more detailed analysis of the capability of the potential donor to meet the needs of the MPD was made, based on the documentation and visits to the most promising candidate systems were arranged.

In actual practice, the selection methodology was applied in an iterative fashion. There had been little planning and no requirements analysis

performed prior to the initiation of the Technology Transfer Project. Consequently, as the review of potential donor sites and systems proceeded, the technology transfer team gained insight into MPD's needs, and MPD revised its priority several times. It became necessary, therefore, to change the list of potential donors to include sites that might meet the newly recognized need and eliminate those that were no longer appropriate.

SELECTION CRITERIA

The Technology Transfer grant established that the donor system must be non-proprietary, coded in COBOL and operational at the donor site. Other selection criteria, beyond the generic identification of the applications modules mentioned above, were developed after the outset of the project. These additional criteria grew out of the experiences gained by the transfer team as the donor site survey activity progressed and as the priority of need for various types of information was refined by the MPD.

SELECTION

In a sense, the selection process was a training experience for the City personnel who participated in the phone survey and site visits. Lacking prior experience in technology transfer, possessed of limited knowledge of the systems capabilities that might be available for transfer, and working without benefit of a detailed requirements analysis, the team's early effort, in certain aspects, amounted to a shopping tour. But more than that, it provided an opportunity to examine first-hand what others had accomplished and it contributed significantly to the ability of these people to crystalize their thinking and resolve numerous questions related to the selection of the system that would be best for Minneapolis.

It was not until late February 1975 that the MPD committed to an on-line system. Prior to that date, there had been considerable uncertainty as to whether an on-line or a batch system would be more appropriate to the needs of the Department. It was during the same period that the need for a Department information systems master plan was recognized and steps were taken to obtain grant funds for that purpose.

Commitment to the transfer of an on-line system triggered an analysis of the implications of that decision. The results showed that additional computer hardware and personnel would be required and that a training program would have to be instituted. In view of these factors it was decided that, even though an on-line system would provide greater direct benefits to the officer in the field, the development of such a system should be delayed in favor of a batch system which could be implemented more quickly and at lower cost. It was felt that early evidence of progress would create a favorable climate for approval of the master plan grant application. The search for a donor site began, therefore, with candidate batch systems.

The technology transfer team began a phone survey of candidate systems and applications including two that were recommended by the contractor. One of these, the Atlanta Police Department system, which provides manpower allocation, crime analysis, personnel deployment and geocoding, was found after a site visit to be not yet operational. It was, therefore, not a valid candidate under the grant-imposed selection criteria. The other application recommended by the contractor was intended to complement the Atlanta system and was consequently eliminated from further consideration.

The search for batch applications and systems suitable for transfer to MPD led to the exchange of information, ideas, and experiences with police personnel in several communities. As a result of these interactions, the Minneapolis people concluded that the most logical and desirable police function with which to begin automation would be the communications/dispatch center; that is, a computer-assisted dispatch application.

The priority for fulfilling information requirements through the transfer of computer technology was revised (as it had been several times earlier in the project) and the search for a donor site shifted to those with operational CAD applications. The number of candidates was considerably more limited than for batch applications.

An option that was open to the Minneapolis team at this point was to drop out of the Technology Transfer Project. Since the MPD was participating in

an ongoing three-year program, the Communications Coordination and Patrol Emphasis Program, which was complemented by technology transfer, the option to quit the transfer program was not exercised.

The phone survey and site visits reduced the list of donors to two candidates; the cities of Jacksonville (Florida) and Charlotte (North Carolina). (See Appendix D, Site Survey Summary.) The Jacksonville CAD software was City-funded and therefore proprietary. A price of \$5,000 or five percent of the development cost was the asking price. Transfer of this application implied, however, that the software would lose its proprietary nature and would thereafter be in the public domain. Jacksonville was not enthusiastic about the prospect. Further, examination of the documentation associated with the software, by another agency interested in transferring it, indicated certain deficiencies. It consisted solely of program listings and an operator's manual. There were no program narratives, system program pointers or overview documentation.

The Charlotte CAD software, on the other hand, was developed under a grant funded by HUD which required extensive documentation. The package was designed and documented with transfer in mind and was in the public domain. The staff of the City of Charlotte were eager to assist in any way possible with the transfer of their system.

Site visits were made to both Jacksonville and Charlotte by members of the transfer team and MPD personnel to confirm the phone survey findings and the information received from other parties. They concluded, based on the facts and data available, that the Charlotte CAD software would be a good base from which to develop a system to meet the requirements of MPD.

LEVEL OF TRANSFER PLANNED

The implementation of a minimum CAD capability was accomplished by transfer of the Charlotte software at the code level. The decision to make a code level transfer was based upon observations by the members of the donor site visit team and the review and analysis of the system documentation. In retrospect, these were insufficient to support a valid decision. During the

software conversion effort, numerous problems were encountered, some significant, which were related to geographical and organizational differences. The fact that most of these problems came as surprises can be attributed to the fact that a careful comparison of the needs of the MPD with the functional design of the Charlotte CAD system was not made. Such a comparison would probably not have changed the decision to proceed with the transfer but would have permitted the project team to plan to cope with the modifications more effectively.

The compatibility of the existing hardware environment at Charlotte with that at Minneapolis and with the planned acquisition of equipment for the MPD was a strong factor in favor of the transfer at the code level.

DOCUMENTATION OF DONOR SYSTEM

One reason for selecting the Charlotte CAD software for transfer was the quality of the documentation. At the time of selection it was reported to be both complete and accurate. It had been produced in accordance with the requirements of the HUD grant under which the Charlotte system was funded.

The donor documentation consisted of the program tape (source code), listings, program descriptions (narrative), module design specifications, user's manual and testing procedures. A data element dictionary was in preparation but not available until one month later. A thorough comparison of this documentation with the functional requirements of the MPD was not made, owing to the lack of recipient site requirements. The consequences of this failure to identify and assess the impact of differences between the functional capability of the Charlotte system and the needs of the MPD and the omission of an analysis to determine the adequacy of the donor documentation caused some problem later in the project.

In total, however, the Charlotte documentation was far more extensive and complete and generally of a higher quality than that of any other system reviewed by the transfer team. The program descriptions were particularly good and the literals used throughout the program listings were excellent.

Section VI

IMPLEMENTATION SCHEDULE AND PROCESS

PRELIMINARY PLANNING

A work plan and milestone chart were developed in preparation for the Phase III implementation of the MPD/CAD system following the firm decision to implement a computer-aided dispatch application. This plan served as the project work plan until the Charlotte software was selected and the major design modifications that would be required were identified. At that time it became necessary to make major revisions in the preliminary plan and prepare a schedule of tasks specific to the transfer of the donor software selected. (See Appendix E and F, Initial and Final Phase III Work Plans.)

Initially, it was contemplated that the Minneapolis team would work closely with a Madison (Wisconsin) team that was attempting to transfer the same software. The Madison effort was terminated early in the period for reasons unrelated to the Technology Transfer Project, but not until the Minneapolis team had received valuable assistance in isolating problems associated with compiling the Charlotte programs.

PROJECT WORK PLAN AND SCHEDULE

The work that had been identified as necessary to accomplish the transfer of the CAD donor software was divided into five major categories, each composed of discrete tasks. The major categories were:

- Geographic Base File Generation
- Squad and Response Area Changes
- Call Assignment
- System Integration and Testing
- Training and Policy

An implementation task milestone chart was prepared to display the time relationship of the specific tasks within the major categories. Significant milestones associated with each task and manpower allocated to each task by

individual by month were also depicted. A large wall-sized rendering of the chart was prepared and displayed in a prominent location in City Hall so that all might be aware of the project and its status. (See Exhibit 6-1, Phase III Project Plan and Schedule.)

The comparison of MPD needs and the functional capabilities of the Charlotte system had not been sufficiently exhaustive to identify the less obvious changes that would be required to adapt the donor software to the Minneapolis environment. Indeed, numerous problems of varying impact were encountered as work progressed. These will be discussed in the remainder in this report. The point to be made here is that the need for many unforeseen changes, some associated with identified tasks and some not, came to light during the implementation because the donor software capabilities were not thoroughly assessed as a part of the Phase III planning and scheduling activity. As a result, the transfer team was constantly annoyed and distracted by fixes, many of little consequence, that were discovered during testing and operational user training.

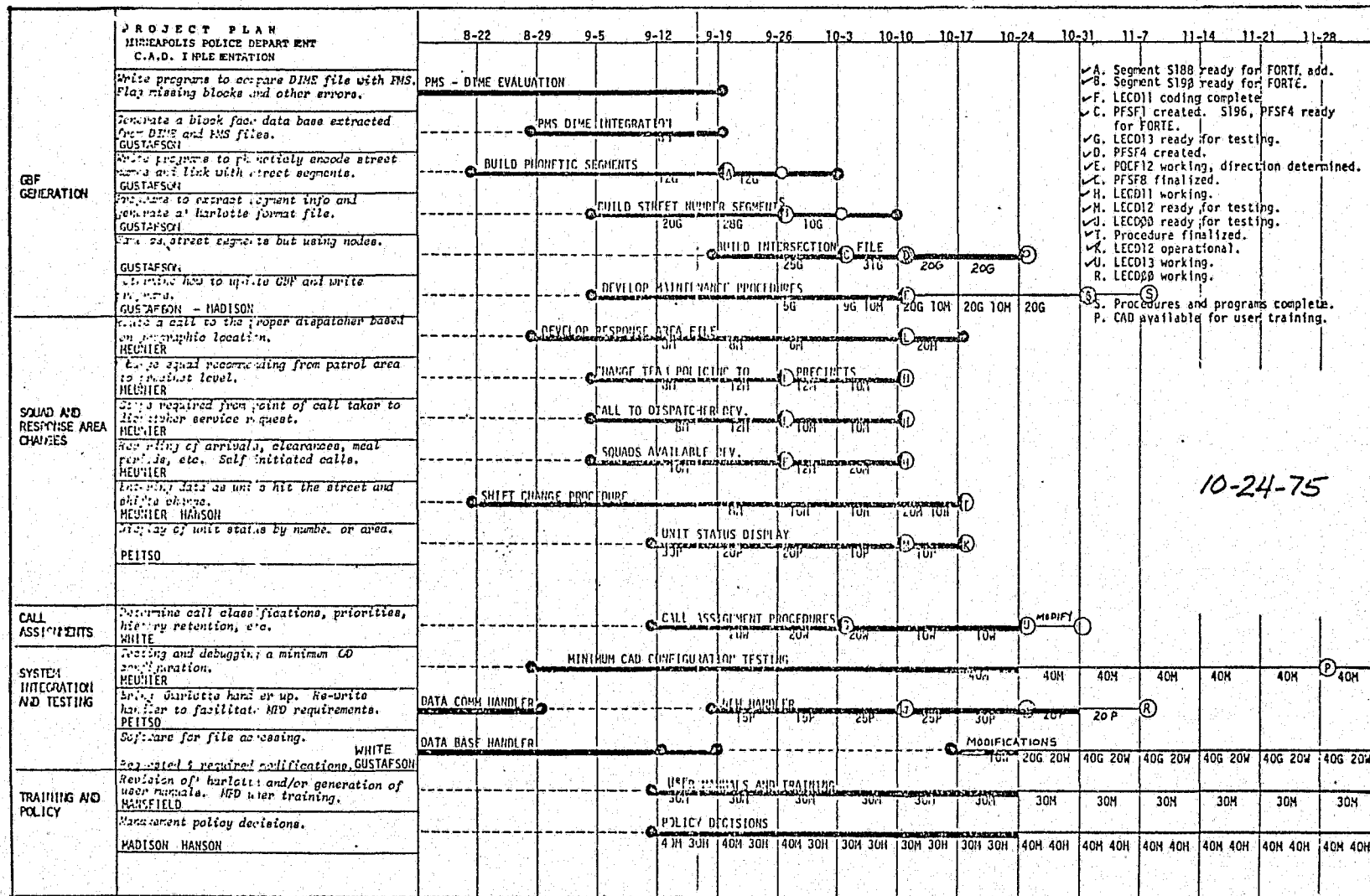
IMPLEMENTATION OF THE SYSTEM

The Minneapolis team received overview documentation and core requirements specifications for the Charlotte CAD system early in May 1975, and began their familiarization with the donor software. Program source code tapes, documentation and training guide were requested from Charlotte personnel. The processing of the request, along with delays inherent in the mailing system, resulted in a lapse of one month between request and receipt. The Charlotte materials were received on June 4, 1975.

The first attempt to list the program source code from the tape resulted in a tape parity error. Subsequent attempts were unsuccessful and after several days of consultation with both Charlotte and Madison personnel, a new source code tape was received from Madison on June 9, 1975. This was a copy of a tape that had been successfully compiled at Madison. Minneapolis successfully listed the program source code from this second tape but the initial attempt to compile was fruitless owing to the use of an incompatible version of the COBOL compiler.

Exhibit 6-1

PHASE III PROJECT PLAN AND SCHEDULE



A visit was made to the Charlotte site to observe the system in operation, obtain first-hand counseling from the site personnel and familiarize the transfer team with the details of system functions.

During these first weeks of the implementation phase, the terminal configuration for the MPD/CAD was determined. Delivery time for Burroughs TD820s was determined to be about sixty (60) days. The impact on the implementation schedule of waiting for TD 820s was determined to be unacceptable. Two (2) TD 802s were ordered for June 1, 1975, delivery with the intention of using them for system testing and, at a later date, upgrading to TD 820s for implementation. Resolution of the terminal configuration consumed two to three weeks.

Development and testing of the MPD/CAD was carried out in the City of Minneapolis Data Processing Center. The system configuration is described in an earlier section. The two TD 802 terminals were added to that system to facilitate testing.

The MPD had no computer at the outset of the project. When the decision to transfer the Charlotte system was made, the MPD investigated the possibility of acquiring a mini-computer for the CAD function. They decided, for several reasons, to obtain a Burroughs B4700 rather than the mini. Among those reasons were the following:

- Mini-computer systems were not available on lease
- The level of service was less than that available from mainframe manufacturers
- COBOL compilers for mini-computers were less sophisticated; did not generate very good code
- Identical computer resources could provide a backup capability using the city system.

The generation of the geographic base file was the single most time-consuming task in the transfer effort. The magnitude of the body of data that had to be dealt with, and the need to write programs to compare and to extract information and assemble it into a geographic base file were the primary

contributing factors. Other significant issues that had to be dealt with were to determine the status (completeness and accuracy) of the DIME file, and developing an approach to combining the DIME and property files to create the geographic base file.

The most significant design modification made in the software compensated for organizational and procedural differences between the donor and recipient sites in the method used to assign units geographically within their respective jurisdictions. The computer programs were modified to conform with the practice of the MPD.

A difference in complaint call priority assignment policy was cause for other changes in both software and procedure. New procedures for update of system files at shift change information were implemented.

Both the telecommunications and file handling software were modified to permit testing of the CAD system in the city data processing equipment.

DOCUMENTATION

The donor system documentation was extensive and complete. It consisted of the program source code tape, listings, program narrative descriptions, module design specifications, a user's manual and testing procedures. The data element dictionary was not immediately available. It was in production and completed about one month later. The apparent high quality of the documentation was a major factor in the selection of the Charlotte software for transfer.

The use of this documentation to support the transfer process was not without problems, however. Although the initial review had not revealed the fact, closer inspection of the program documents and comparison with the program code showed that many of the most recent program changes incorporated by Charlotte data processing personnel were not reflected in the documentation. This reduced the usefulness of certain items to some extent and caused a loss of team confidence in all of the descriptive materials. It

also increased the magnitude of the documentation update task to the extent that these deficiencies had to be discovered and corrected in addition to the inclusion of the changes that resulted directly from the transfer activity.

The programming staff also had some difficulty with the organization of the documentation. In some instances, the description of a program preceded the definition of a file required for its operation. This caused some confusion and annoyance for the programming staff.

The user's manual that accompanied the donor system was deemed unsatisfactory for training. It was condensed into an operations handbook which then provided a more concise and tutorial tool for use by the operations personnel who would be the system users.

At one point in the process of deciding how best to approach the task of reflecting the modified program design in the documentation, the transfer team considered completely reworking the material in the PRIDE format, a highly structured and detailed set of standards and conventions for the documentation of complex systems. The idea was abandoned when the time and cost of such a massive effort was considered.

The donor site documentation, despite some inaccuracies and redundancy, was looked upon as good. Considering the volume of material and the completeness of coverage of all aspects of the system, the manuals were remarkably well done. The program narrative descriptions were especially useful to the transfer team as were the excellent literals incorporated in the program code.

TRAINING

Initially, it was planned to use an approach of training the trainers. Specifically, four sergeants who serve as shift supervisors in the Communications Division were to be trained in the operation of the new system and they, in turn, would train their people. The time necessary to accomplish these two training cycles (first the trainers, then the operations personnel)

was determined to be too great, however, and a plan was developed to train the communications personnel assigned to one shift. The CAD could then become operational on a one-shift basis until the entire staff could be trained.

Training was conducted using the city computer system since the MPD computer had not yet been installed. Second shift (3-11 p.m.) personnel were selected for training first because they would rotate to first shift (7-3 p.m.) shortly after completion of the course. Additionally, the workload on the city computer was lighter during this period and response to terminal actions was therefore more rapid than during daytime hours.

Two terminals were installed and connected to the city computers. Line adapter problems caused delays in this installation. An additional week was lost when a lightning storm rendered the terminals inoperative.

A training program utilizing tape recordings and visual aids was developed. An operations handbook was prepared for use in place of the Charlotte user's manual which was determined to be unsuitable as a training manual.

The CAD system became available for training on December 1, 1975, using two terminals, one a complaint clerk terminal and one a dispatcher's terminal. The training effort merged with the system test effort since testing had not been completed. Errors discovered during training were relayed to the transfer team for correction. Fourteen communications personnel were given a total of one hundred hours of hands-on training. The training effort was hindered by the occasional unavailability of either the computer system or the communications personnel or both.

The MPD/CAD system did not become operational on a single shift basis on January 1, 1976 as planned because installation of the police computer had not been completed. By the end of January, the trained personnel had rotated to other shifts and the trained complaint clerks separated from the trained dispatchers. The end result was that training was completed in an on-the-job environment.

A serious morale problem in the communications center plagued the entire training effort. It centered around the work environment which was something less than ideal. The situation improved somewhat when management initiated a study of measures to improve working conditions including the acquisition of a new communications facility.

The training staff noted during the course of instruction that some users are extremely hesitant to take the first step toward learning new techniques, particularly because their knowledge of computers and data processing is limited. The situation seemed to be remedied by time and patience on the part of the trainers.

Section VII

MODIFICATION ANALYSIS

The Charlotte CAD software consisted of approximately 25,000 lines of COBOL code. The transfer team changed approximately 2000 lines or about 4% of the total. Some of the changes consisted of eliminating code which was not required in the recipient site environment. The principle modifications are discussed in the following paragraphs.

ORGANIZATIONAL/FUNCTIONAL IMPACT

The very fact of installing an automated information system where none previously existed implies change--change in organization, change in procedures, change in policies--in some obvious and often not-so-obvious respects.

Most obvious is the fact that the MPD had to change its communications function to accommodate the new computer-aided dispatching system. The changes were procedural, as exemplified by the data entry and update procedures that had to be adopted. They were organizational insofar as they impacted staffing levels and assignments. Policy change was involved throughout the transfer project from the initial commitment to develop an on-line system to the decision to co-location of the City and MPD computers to enhance backup capability.

Most of the organizational and functional impact on the recipient site was the result of adopting a CAD system. Organizational differences between the donor and recipient jurisdictions were largely solved through redesign of the software. Procedural and functional changes within MPD came about mostly because of the unique requirements of the CAD operation and the fact that a need did not previously exist. For example, shift change information (e.g., new squads on duty, officer changes) must be entered into the system in a timely manner. Procedural changes were required to ensure receipt of the necessary information by communications supervisors so that they can be entered as the units go on duty.

HARDWARE IMPACT

The requirement for additional hardware support impacted both the city data processing center and MPD. The MPD had no computer at the outset of the technology transfer project. The city data processing center is equipped with a Burroughs B4700 computer. It was necessary, therefore, to decide how the CAD function would be supported and to select the proper configuration and the agency to operate it.

The possibility of selecting a minicomputer was considered but was rejected for the several reasons discussed earlier in this report (Section VI, Implementation of the System). The MPD acquired a Burroughs B4700 computer system. The city and MPD computers were co-located to enhance the backup capability implicit in the similarity of the configurations.

Delivery of the MPD computer could not be effected in time to be used in the design modification, system integration and test efforts. These activities as well as the first of the training activities were carried out on the city computer. It was necessary to connect two terminals to the city system to support these tasks. The delivery of Burroughs' TD 820 terminals could not be effected in time to meet test schedule requirements and TD 802s were substituted on an interim basis. These served throughout the test period. When the MPD computer was installed (January 1976) the TD 802s were replaced with TD 820s, which proved to difficult. The TD 820s were eventually replaced with TD 800s.

The hardware configuration acquired by MPD to support the computer assisted dispatch function consists of:

- 1 - Burroughs B4700 computer
- 7 - Burroughs Disk drives
- 7 - Burroughs Tape drives
- 8 - Burroughs B800 terminals

SOFTWARE IMPACT

The similarity among the computer system configurations at the donor and recipient sites was a significant factor in favor of a successful transfer.

The COBOL code written for the Charlotte Burroughs B2700 computer was upwardly compatible with the B4700 systems in Minneapolis. The application programs' code, therefore, required no changes as a result of hardware configuration differences.

The same was not true of the system software. Modifications were made in both the telecommunications and file handlers in order that the system might be tested in the existing city computer equipment. These included changes in telecommunication formats and file identification which were easily accomplished.

Response times for the transferred system were (and still are) slow. The magnitude of the problem was reduced by changing the system design from single thread to multi-thread through a restructuring of the programs and creating five new system programs to multi-thread the applications. This proved to be a significant task in terms of the time and effort required.

The major factors that impacted on the donor software design and code were the differences in operational policy and organizational structure that existed between the donor and recipient sites. Among these were the widely divergent methods of subdividing the geographic jurisdiction for unit assignment purposes and the incompatible policies concerning the assignment of call classification and priority.

Squad and Response Area Change

A significant design modification was required in the donor software to compensate for an organizational/procedural difference between the Charlotte Police Department and the Minneapolis Police Department. The donor system dispatch function, as designed to serve the CPD, centered on the assignment of manpower resources within either a north or south command area and to team areas within each command area. Each command area was divided into five team areas, each of which was subdivided into three response areas. Minneapolis, on the other hand, bases its manpower allocation on precincts and beats. The MPD jurisdiction is served by two radio channels with three precincts assigned to each channel. Precinct boundaries are not fixed,

but change with the need to allocate resources differently in response to seasonal shifts in service requirements or special situations.

The design of the command and patrol functions of the CAD software was extensively modified to conform with the organization and policies of the MPD. Computer programs were modified to make proper assignments of calls to dispatchers based on geographic location, recommend appropriate squads, record arrivals on scene, clearances, out-of-service and other status changes. Procedures to accomplish proper entry and update of system files at shift change were developed. The redesign of this functional area was the single largest design change made to the Charlotte software.

Complaint Call Classification and Priority

Another operational policy difference between the donor and recipient sites that was compensated for through the redesign of a software function was the classification of complaint calls and the assignment of priorities. The Charlotte Police Department classifies calls as emergency, routine, and low priority. The definition of emergency includes events such as burglary in progress. The transfer team had the option of revising the policy of the MPD to conform with the CPD practice or to redesign the call classification function to meet the requirements of the MPD. They chose the latter.

Custom Tailoring

Other software changes originated as operations personnel requests generated as a result of experience gained during the concurrent test and training activity. It should be noted that, although this concurrent effort was useful in identifying errors and producing valuable suggestions for system improvements, it proved to be a continuing source of frustration to the programmers who were responsible for responding to the constant flow of reports and requests.

Among the potential problem areas identified by operations personnel was the assignment of primary and assisting unit designations to units dispatched in response to a call-for-service. Operating procedure in MPD is

that the first unit to arrive on the scene is the primary unit. The CAD system design provides for the dispatcher to designate the primary unit at the time of dispatch. If that unit is not the first to arrive on the scene, the dispatcher must recall the display and modify it to reflect the first arriving unit as primary and designate the other units as assisting.

A similar inconvenience was encountered in clearing units assigned to a call. Although more than one unit may clear at the same time, the CAD restricted the operator to clearing only one unit per transaction.

Early signs of another design deficiency were manifested during the site visit to Charlotte to observe the CAD system in operation when it was noted that a complaint clerk was making handwritten notes of a complaint call before entering the information at the terminal. It was thought at the time that proper training and experience would correct the situation. Practical knowledge gained in testing the system proved that the on-line entry of complaint information was too cumbersome to permit direct entry unless a procedure could be developed whereby information could be extracted from the complainant in the order required for entry into the system.

As familiarity with the operation of the CAD system increased, the users were able to suggest additional enhancements. Illustrative of the nature of the proposals are the following:

- Shorten transaction codes or eliminate using the terminal function keys.
- Implement a "sign-in" feature to eliminate the need for the complaint clerk to repeat the operator number for each complaint call.
- Change screen format to place complainant information closer to the top to reduce need for excessive tabbing.
- Convert numerical street codes to alpha.
- Eliminate four-digit address code after it is converted to alpha on the screen.
- Forced queue entry of emergency calls.
- Add a reverse tab feature for all terminals.

Geographical Base File Generation

Generation of the geographic base file began immediately following selection of the donor site. It began with the evaluation of the DIME file and comparison with the city's property management file. It was determined that the DIME file was ninety percent accurate as of 1970 and that it was being updated through 1974. The update was expected to be complete by January 1, 1976, in time for testing on the MPD computer. The principal areas of inaccuracy that had to be handled were those in the vicinity of recent freeway development and those areas of the city that were undergoing rapid growth or redevelopment. These areas were updated from the City Property Management file using computer programs to compare DIME file data with the property management file and identify missing blocks and other differences.

Other programs developed by the technology transfer team were used to extract the data needed for the geographic base file from the DIME and the property management files and to phonetically encode and link street names and segments. Street intersection data was also generated with the aid of computer programs. Update programs and procedures were prepared once the structure and organization of the geographic base file was finalized.

One operation problem encountered in the use of the geographic base file developed for Minneapolis illustrated the consequence of a subtle difference between donor and recipient. The effect of the dissimilarity of the geographical configuration of the two cities' street patterns was not foreseen when the transfer effort was initiated. The vast majority of the streets in Charlotte were short while those of Minneapolis were quite long. The design of the address search algorithm was such that the time required to search out a given address was a function of the length (i.e., the range of addresses or the number of blocks) of the street. Since all of Charlotte's streets were relatively short, this feature was of no significant concern at the donor site. In Minneapolis, on the other hand, the time required to process a transaction involving a search of the address file was noticeably longer and proved to be an annoyance to terminal operators. No attempt to redesign the function was made during the transfer project. The MPD will live with problem temporarily.

Section VIII

SUMMARY OF TRANSFER EFFECTIVENESS

The computer assisted dispatch system being transferred to the Minneapolis Police Department will fulfill a substantial portion of their information requirements for the communications and dispatch function.

The Information System Technology Transfer Summary Report, dated April 1976, defined three levels of transfer:

- Concept - the concept level of technology transfer involves using ideas from particular application programs, the identification of files required to support these applications, the general contents of output reports.
- Design - transfer at the design level refers to the adoption of another agency's programming specifications, procedures for collecting data, data element definitions, etc.
- Operational - transfer at the operational, or "code" level implies use in the recipient agency of actual computer programs, forms, output report formats, access instructions, etc.

The Minneapolis transfer was accomplished at the operational or code level. Significant design changes were made in a limited number of functions to accommodate organizational and geographic differences between the donor and recipient sites. Certain other features of the system, as it was implemented, were not entirely adequate to the user's needs but would be tolerated for an interim period in the interest of placing the system in an operational status. Over a period of time the system might undergo further design change but, insofar as the Technology Transfer Project was concerned, the original objectives were met.

CRITIQUE OF PROJECT

The original objectives of the Minneapolis Technology Transfer Project should form the basis for any critique of the undertaking. Those objectives, as

stated in the Information System Technology Transfer Summary Report, dated April 1976, were:

- To transfer one or more criminal justice information system applications to each of the participating recipient agencies.
- To provide thorough documentation of the problems encountered, solutions to those problems, and recommendations that may benefit other agencies involved in the transfer process.

The Minneapolis Police Department transferred, substantially intact, the computer program source code of a computer-assisted dispatch application. In addition, the donor system documentation was retained and revised to reflect the changes required to adapt the programs to the recipient site environment. The changes that were made to effect the transfer were those that might be expected where donor and recipient differ in terms of organization, procedures and geography. In total, approximately 2,000 lines of COBOL code out of 25,000 were either changed or eliminated.

In terms of project goals, the transfer effort successfully met the first objective. The computer-assisted dispatch application was implemented and placed in operation to support the Minneapolis Police Department. The effectiveness of that support, however, was seriously affected by the failure to involve and obtain the commitment of the police department early in the project and by the absence of a functional requirements analysis against which to compare potential donor systems. Consequently, the impact of major organizational and geographical differences between the recipient and donor sites were not recognized early enough to be considered in the selection process and had to be dealt with on an ad hoc basis during the implementation phase.

Documentation of the transfer experience for the benefit of other agencies was accomplished in the Summary Report mentioned herein. The report described implementation problems experienced by the agencies that participated in the LEAA Region V Technology Transfer Project and made recommendations for their avoidance and control. The Minneapolis site accomplished the second

objective of the project through the excellent documentation that was provided for the report.

CONCLUSIONS

The major conclusions that can be derived from the experiences of the Minneapolis Police Department Technology Transfer Project are:

Commitment and involvement of management personnel are necessary elements of system development.

In an environment where management organization is diversified and the project will cross a number of supervisory functions, cohesiveness and commitment to a project are critical. Without them the project's success is seriously threatened. Similarly, the continuing interest and assistance of management, even limited to a reviewal function, can be an important influence on the operational personnel affected by the system. Their interest and morale will be critical to implementation, and a disinterested or incohesive management will be reflected in user participation.

Development of an information system requires the early commitment and participation of the user personnel.

Early experiences in this project are clearly illustrative of the consequences of attempting to organize and plan for technology transfer without the full commitment of the user.

Indecisiveness in choosing between batch and on-line applications delayed the site survey task and was the cause of some confusion at the beginning of the project. Vacillation in setting development priorities for the initially selected modules contributed to startup delays.

The Minneapolis Police Department user personnel did not participate in the early project planning and site survey activity. The significance of their contribution to the development effort and the benefit they gained would have been increased had the potential been recognized in project planning.

An analysis of the information needs and functional requirements of the user is an essential prerequisite to selecting a system for transfer.

Selection of a system for transfer to fulfill the information needs and the functional requirements of a user demands that these needs and requirements be identified with a degree of specificity consistent with the type of transfer planned.

Lacking such an analysis, the Minneapolis donor selection process was impeded by the ever-changing selection criteria that evolved as the site survey team gained new knowledge from its agency contacts.

Careful comparison of user information needs and functional requirements with donor system outputs and functional capabilities is the key element of the selection process.

The ability of a donor system to meet the needs of the recipient site can be assessed only through a careful and thorough comparison of the system capabilities with user requirements.

The Minneapolis transfer was accomplished without benefit of such comparison and, although the completion of the transfer cannot be denied, much of the annoyance and frustration that accompanied the implementation and testing activity could have been avoided had some of the more obvious problems been identified and planned for in advance. The fact that a code level transfer was undertaken made the comparison particularly necessary because of the need to discover the subtle differences in organization, geography, and procedure that translated into difficult and time-consuming system design problems.

Organization and planning for technology transfer must consider the people as well as the technical aspects of the endeavor.

The implementation of an automated information system can be a difficult experience for the people involved even when all goes smoothly. Failure to involve the right people at the right time can affect the entire project from initial planning to acceptance of the system by the ultimate user.

People problems can, and in some instances during this project did, overshadow the technical problems. Not infrequently, the source of problems will be outside the immediate scope of the project. Whatever the source, however, if it is not identified and the problem resolved, the technical aspects may become more difficult to deal with.

Where an environment has little or no prior experience with data processing systems, a carefully planned gradual introduction is required.

In many cases the step from no data processing experience to on-line, video terminal magic has been disastrous. Both in terms of user reception as well as the ability of the system to meet all the functioning needs, a gradual conversion is beneficial. The use of batch or remote off-line entry systems is often helpful. Extended training or parallel operation periods are also methods of ameliorating the impact of on-line operations. The need to use such devices must reflect the sophistication and willingness of the personnel involved.

APPENDIX A

ORIGINAL PROJECT WORK PLAN AND SCHEDULE

ORIGINAL PROJECT WORK PLAN AND SCHEDULE

Region V

Computer Technology Transfer Program

NOTE: The dates below apply to MINNEAPOLIS, MICHIGAN, and LAKE COUNTY. Change Phase I Start Date to 26 August 1974 and Duration to 9 weeks, also Activity I.1 Start Date to 26 August 1974 and Duration to 5 weeks, for WISCONSIN, NORIS, and MARION COUNTY.

PROJECT SCHEDULE

PROJECT PREPARATION

PSi has begun the process of preparing the basic material required for the Region V Computer Technology Transfer Program. This effort includes the refinement of the project work plan/schedule for your agency, the associated budget data, and the preparation of forms required for collecting data from the agencies/units involved in your system and the forms required for the collection of data from potential donor agencies. The refined work plan/schedule is reflected herein.

Start Date: 15 July 1974
Completion Date: 19 August 1974
Duration: 5 weeks, 1 day

PHASE I: SYSTEM REQUIREMENTS ANALYSIS

Upon completion of the project work plan refinement process, the PSi/CSC project team will work with the selected agency personnel to determine system requirements and develop system specifications.

Start Date: 19 August 1974
Completion Date: 25 October 1974
Duration: 10 weeks

Activity I.1: System Requirements Study

The emphasis of this activity will be to determine the actual system or application module needs of the various recipient sites.

Start Date: 19 August 1974
Completion Date: 27 September 1974
Duration: 6 weeks

Associated Tasks:

- Task I.1-1: Project Team Orientation
- Task I.1-2: Review Present Systems or Applications
- Task I.1-3: Review of Present Hardware Configuration
- Task I.1-4: Analysis of Informational needs

Activity I.2: System Specification

During Activity I.2 the foundation for Phase II, System Survey and Selection, will be completed. This activity provides for

(continued)

the identification of the requirements that must be satisfied by the system or module to be transferred.

Start Date: 23 September 1974
Completion Date: 25 October 1974
Duration: 5 weeks

Associated Tasks:

- Task I.2-1: Document Applications Required
- Task I.2-2: Site Agency Specification Review

PHASE II: EXISTING SYSTEM SURVEY AND SELECTION

Upon completion of Phase I and its associated activities and tasks, the PSi/CSC project team will initiate the existing system or application review and selection phase of the project.

The PSi/CSC project team personnel will visit three to four potential donor sites. The visits will be made by two project team members comprised of the PSi criminal justice system specialist and the CSC technical systems analyst. The project director and site supervisor will visit potential donor sites as deemed necessary to support the project team.

Start Date: 28 October 1974
Completion Date: 20 December 1974
Duration: 8 weeks

Activity II.1: Review Existing System Documentation

The PSi/CSC project team will review existing LEAA and PSi/CSC documentation on criminal justice agency information systems to ascertain possible donor candidates.

Start Date: 28 October 1974
Completion Date: 8 November 1974
Duration: 2 weeks

Activity II.2: System Survey and Selection

This activity calls for visits to selected possible donor sites. (The six PSi/CSC project teams in Region V will have developed knowledge on all six sites and therefore will be able to interchange both information and ideas in periodic meetings during this activity.) The following tasks have been identified.

Start Date: 11 November 1974
Completion Date: 6 December 1974
Duration: 4 weeks

Associated Tasks:

- Task II.2-1: Select and Schedule Donor Site Visits
- Task II.2-2: Review Donor System and Documentation
- Task II.2-3: Document the Surveys & Provide Recommendations

(continued)

Activity II.3: System or Module Selection

Upon completion of the first two activities, it is anticipated that the recipient site personnel will visit one or two of the prospective donor sites to review the system and discuss its capabilities with the present users. Following the site visits, alternative methods of the transfer process will be presented.

Start Date: 2 December 1974
Completion Date: 20 December 1974
Duration: 3 weeks

Associated Tasks:

Task II.3-1: Review of sites and survey documentation
Task II.3-2: Prepare system or module alternatives

PHASE III: CRIMINAL JUSTICE TECHNOLOGY TRANSFER

The transfer of existing applications software from operation on donor agency hardware system to operation on the recipient agency hardware system will be accomplished by establishing a transfer team to translate the existing programs and data files.

Start Date: 23 December 1974
Completion Date: 25 July 1975
Duration: 31 weeks

Activity III.1: Implementation Management Organization

The project director will be responsible for all work done. The director will be fully responsible for:

- acquiring and allocating the required resources
- distributing the work
- monitoring performance
- reporting status.

The schedule for the transfer program will be designed to promote cost effectiveness. Other factors that will be used to determine a schedule are:

- the transfer constraints listed in the RFP
- the number of programs to be translated
- the minimum linear time required for the transfer
- the manpower loading for each of the translation paths

Start Date: 23 December 1974
Completion Date: 25 July 1975
Duration: 31 weeks

Activity III.2: Review Standards and Procedures

Standards will be developed for both the transfer process and for ongoing operations. The standards will consist of minimum

(continued)

requirements for computer software, for software operational procedures, and for supporting documentation.

First will be standards for the translation activities. These will include standards for the submission of programs and test data, and standards for transfer software including listings, tapes, and supporting documentation. Second will be standards for ongoing operations. These will include standards for administrative purposes, including the issuing and controlling of identifiers for files, tapes and reports. The standards will provide a systematic and uniform basis for issuing, locating, and controlling each element within the system.

Once the standards have been defined and agreed upon, they will be used as guidelines for the transfer activities and to facilitate smooth operations.

Start Date: 6 January 1975
Completion Date: 25 July 1975
Duration: 29 weeks

Activity III.3: Input Collection and Distribution

The project team will receive and review the necessary material for each program slated for transfer. This material represents the Input Package. It consists of:

- machine readable tape of program
- program listing
- system description documentation
- program flow chart
- test data description
- test data file
- test and validation procedures
- user results
- JCL for program and data base

Start Date: 16 December 1974
Completion Date: 3 January 1975
Duration: 3 weeks

Activity III.4: Production Control during Translation

Production control entails complete surveillance and information feedback for each input package throughout the cycle. Audit and control will uniquely identify each element, whether it be a program, test data file, tape, or document.

Audit and control will use these identifiers to schedule and track each conversion as it proceeds. The team will be responsible for revising the schedule based on its analysis of the problem, and will report its revision to audit and control. Additionally, the receipt of an input will trigger a status report to audit and control. Schedule revisions and status reports will provide information for ongoing reallocations of resources and work redistribution.

(continued)

The work flow must proceed in a single direction if it is to handle the projected volume within established time limits. The primary objective of production control is to maintain effectiveness and efficiency.

Start Date: 30 December 1974
Completion Date: 18 July 1975
Duration: 29 weeks

Activity III.5: Program Conversion

Upon selection of the appropriate packages or modules to be transferred and collection of all pertinent data, the PSi/CSC project team will begin program conversion activity. Where possible, the recipient site personnel who will have system maintenance responsibility will be encouraged to work with the PSi/CSC implementation team to increase the recipient site personnel's understanding and awareness of the system.

Start Date: 13 January 1975
Completion Date: 6 June 1975
Duration: 21 weeks

Associated Tasks:

- Task III.5-1: Preparation
- Task III.5-2: Execution
- Task III.5-3: Review Converter Output
- Task III.5-4: Compile New Version of Program
- Task III.5-5: Review Compiler Output
- Task III.5-6: Trouble Shooting Team
- Task III.5-7: JCL Conversion

Activity III.6: Test Data File Conversion

The data file conversion process will be accomplished in two stages. Initially, the team will evaluate the baseline documentation to determine a detailed conversion, determine and perform any required file redesign, and determine and develop additional file conversion aids. Then, conversion of the test data files will be performed. In addition to providing the data required for the unit and functional unit test activity, test data file conversion will serve to verify the conversion procedures to be used in the operational data file conversion.

Start Date: 13 January 1975
Completion Date: 11 July 1975
Duration: 26 weeks

Associated Tasks:

- Task III.6-1: Define Inputs
- Task III.6-2: Define Outputs
- Task III.6-3: Test Preparation and Run
- Task III.6-4: Test Run Evaluation
- Task III.6-5: Test Run Problem

(continued)

Activity III.7: System Testing

The following items will be required as inputs to the overall testing function:

- converted source program file
- source program listing
- program description
- test and validation notes
- test data description
- user results
- test data file
- JCL for the program(s) and test data

Start Date: 30 December 1974
Completion Date: 11 July 1975
Duration: 28 weeks

Associated Tasks:

- Task III.7-1: Logging and Control
- Task III.7-2: Review Test Package
- Task III.7-3: Monitor and Revise Schedule
- Task III.7-4: Route All Work Packages

Activity III.8: Product Packaging

The packaging function is the last operation in the conversion. The packaging team will update program documents and flow charts to reflect converted programs. The entire package will be reviewed for completeness and accuracy and then turned over to audit and control for submission for parallel testing. Inputs consist of:

- program descriptions
- source program listing
- machine readable tape
- test and validation notes
- test data description
- test data file
- JCL file program(s) and data
- operational procedures
- test results
- user results

All program documentation (e.g., program descriptions, test and validation procedures, test data descriptions, etc.) that is to be generated will be updated to reflect changes resulting from translation and testing.

Parallel testing will allow the user of the program to evaluate the translated program in the new environment. When the program has successfully undergone parallel testing, the testing will be terminated and the program will be considered formally accepted by the recipient site.

(continued)

Start Date: 12 May 1975
Completion Date: 11 July 1975
Duration: 9 weeks

Associated Tasks:

- Task III.8-1: Logging and Control
- Task III.8-2: Update of Program Documentation
- Task III.8-3: Update of Test Documentation
- Task III.8-4: Manual Flow Chart Generation
- Task III.8-5: Product Package Review
- Task III.8-6: Training Manuals

PHASE IV: TECHNOLOGY TRANSFER DOCUMENTATION

Phase IV is the culmination of the proposed PSi/CSC project activity; the documentation related to the entire transfer process for each site, and a final report of the analysis of the transfer process as a technological project.

Start Date: 23 June 1975
Completion Date: 22 August 1975
Duration: 9 weeks

Activity IV.1: Individual Site Transfer Documentation

This activity is initiated at the start of the project. The PSi/CSC team will maintain a transaction record to monitor and record all activities directly related to the technology transfer process. This approach will facilitate the documentation process and assure both the accuracy and completeness of the information.

The final reports on the recipient site transfer will describe in detail the process by which the transfer was accomplished. Problems encountered will be discussed and solutions described including those which were unsuccessful. The discussion will not be limited to problems related solely to the computer facility or the technical aspects of the transfer. Organizational differences in the criminal justice environment between donor and recipient site may affect the success of the transfer effort. The final report will also address the roles and attitudes of recipient site technical personnel and the personnel of the user criminal justice agencies as they affect the transfer process.

A significant feature of this report will be an analysis of the individual site performance in relation to the initial plan in terms of time and resource requirements.

Start Date: 23 June 1975
Completion Date: 1 August 1975
Duration: 9 weeks

Activity IV.2: Technology Transfer Report

The previous activity provided for the development of a document that describes the transfer process at each site. This activity

(continued)

will summarize the process, problems, constraints, benefits and other considerations into a single report for use by LEAA and other criminal justice agencies. The purpose of this document is to report the analysis of the six recipient site transfer experiences and present recommendations to facilitate the transfer process. The report will examine the relative success of each transfer in terms of results achieved versus resources expended. It will compare and evaluate alternative solutions to similar problems where site-team have selected different techniques to achieve their goals.

Start Date: 4 August 1975
Completion Date: 22 August 1975
Duration: 3 weeks

APPENDIX B

MINNEAPOLIS POLICE DEPARTMENT
ARTICLES FOR THE
JUSTICE INFORMATION SYSTEM

MINNEAPOLIS POLICE DEPARTMENT
ARTICLES FOR THE
JUSTICE INFORMATION SYSTEM

FOREWARD

These articles established the procedures for the recording, storage, reporting, dissemination, and use of contact record information as defined herein. These provisions are not to be construed as having an effect on the individual's or public agency's right to access or rights of security and privacy that are authorized by any other provision of law.

ARTICLES

- ① The department finds and declares that for the performance of their official duties, accurate and reasonable information is required in criminal offender records, contact data, administration procedures, and command and control functions.
- ② The department finds and declares that aggregate information greatly improves the decision-making process in the performance of their duties and provides the department with the policy-making and policy-research capabilities not possible with a segmented, manual record keeping system.
- ③ The department finds and declares that decisions made in subsequent stages of the justice process of prosecution and adjudication require that enforcement information be available on a timely and accurate basis.
- ④ The department finds and declares that speedy access to information is necessary concerning: all felonies, selected misdemeanors, outstanding warrants, stolen and recovered articles; and related information concerning arrests, charges, subsequent articles; and by what authority and upon what terms; results of pretrial proceedings, results of any trial or proceedings including any sentence or penalty, results of and direct or collateral review of that trial or proceedings, admissions to any confinement or release; and, where appropriate, re-admission and re-release data, authority and status of any act of pardon or clemency, or formal termination of control by the criminal justice process.

- The department finds and declares that non-public record information including intelligence reports, analytical reports, investigative reports, performance reports, administrative records and reports, statistical reports, in fact and elements of information that contain any feature of interpretation or which are not publicly recorded statements of fact, shall not be provided to any individual or agency not directly a component of the criminal justice process.
- The department finds and declares that for the highest efficiency and the greatest utility to the ultimate users of the information system, consolidation of record keeping functions and administrative control over the information provided, the speed and accuracy of the information contained within the files be within the administrative and procedural control of one single division titled Central Records and Statistical Division.

APPENDIX C

JOB DESCRIPTION FOR
POLICE INFORMATION SYSTEMS COORDINATOR

JOB DESCRIPTION FOR POLICE INFORMATION SYSTEMS COORDINATOR

SCOPE

1. Direct the development and operation of the police information system.
2. Coordinate the developmental, prototype, and final implementation of any system that requires an interface with or uses the police information system.

Example: Coordinate the activities of the communication study with the police information system.

3. Be the responsible manager for the police information system which include:
 - Hire/fire
 - Provide security of data, information, and facilities
 - Protect the department's interest in any interactive information system such as MINCIS
 - Provide for privacy records
 - Assist management in decisions for the development of information
 - Identify problem areas
 - Provide cost and budget information
 - Define new programs
 - Develop priorities
 - Develop training methods and procedures

MAJOR TASKS AND DECISIONS OVER THE SHORT RUN (0-6 months)

1. Survey/interview all project directors for all projects to determine scope and direction of each program.
2. Hold joint meetings with the project directors to identify interface requirements and areas of responsibility.
3. Collect and document all programs after each project director submits revised work plan which includes deliverables and timeframes.
4. Provide a briefing to users on program goals, directions, responsibilities and requirements.

5. Develop a user group from the briefings that would act as a participatory decision-making body.
6. Develop subcommittee groups from the user group so that the needs and interests of particular users can be expressed, thus being responsive to the users and encouraging acceptance of the programs.
7. Conduct educational and training sessions such as:
 - Different types of microfilm systems
 - Methods and procedures for paperwork improvements
 - State-of-the-art in police information systemsExample: -CAPER, San Jose (California) Police Department, crime pattern analysis
-CCIS, Computerized Crime Index System, Kansas City (Kansas) Police Department geographic coding of crime patterns
-SEARCH Group activities, nationwide, highly innovative programs such as satellite transmissions, holographic fingerprint ident and others.
 - Forms of communications systems.
8. Develop a budget for an information systems division.
9. Determine staffing requirements.
10. Assist management in determining information system goals and objectives.

MAJOR TASKS AND DECISIONS OVER THE LONG RUN (6-12 months)

1. Obtain personnel.
2. Determine the position of the information systems division with the department's organization structure.
3. Write the grants necessary to implement the next stages of the information system, for example, a unified record study.
4. Assist in updating the department's master plan.
5. Develop a liaison with other departments that may be users of the department's police information system.

APPENDIX D

SITE SURVEY SUMMARY

SYSTEM/ LOCATION	MPD MODULE	CONTACT/ PHONE	CAD	ACCEPTABLE FOR TRANSFER	SOFTWARE LANGUAGE	HARDWARE	OPERATING SYSTEM TP Monitor	COMMENTS/FEATURES	CONTACT P=Phone V=Visit	SITE VISIT BY
Albuquerque, NM		Paul Pedilla 505/766-7683	Yes	Possible	---	---	---	---	P	MPD
Atlanta, GA Police Department	ETS MSS	---		Yes	COBOL Fortran, PL-1 Complete Documentation	370/ 360/40	Power II DOS/VS DOS/	Developed by Public Systems Inc. (PSI). • Manpower Allocation • Crime Analysis • Personnel Deployment • Geocoding	P	MPD, PSI
Atlantic City, NJ	Unknown	609/348-3011	Yes	Possible	---	---	---	City funded, Motorola system. Proprietary.	P	MPD, PSI
Baton Rouge, LA Police Department	ETS MSS OIS	---	Yes	No	---	NCR-Varian	---	Invalid candidate	P,V	MPD, PSI
Birmingham, AL	OIS	---	Yes	Yes— Phase III	---	---	---	---	P	
Boston, MA LEIN Transfer	ETS OIS MSS	---	Yes	Yes— Phase III	---	85500	---	Candidate after privacy and security filter and reprogramming	P	
Charlotte, NC CJIS	ETS OIS MSS	John Horton 704/374-2505	Yes	Yes— Phase III	COBOL	B3700	NDL COBOL	Operational one month. Financed by HUD, developed by SDC Corp. (Santa Monica). Documentation—excellent (requirement of Grant). Burroughs 3700 for Police with DC-4200 front-end mini. City uses 6700. Software is COBOL, NDL handler with mod- ified forte. Burroughs 802 terminals. Future funding for Mobile Car Terminals anticipated.	P,V	PSI
Cincinnati, OH	OIS MSS	Andy Atkinson 503/352-4755	No	Phase III	---	---	---	---	P	MPD, PSI
Dallas, TX Police Department	ETS OIS MSS	---	Yes	Yes— Phase III	APL	370/155	CKS/VS Faster DOS/VS	---	P,V	MPD, PSI
DeKalb, GA City/County	ETS OIS MSS	---	Yes	Yes Phase III	---	B	---	---	P	
Detroit, MI	ETS OIS MSS	Merv Prusinski	Yes	Yes— Phase III	ALGOL	86700	---	Recently converted from IBM 370/145 to Burroughs 6700. System developed by Boeing Computer Services. CICS Program (Assembly Imbedded in COBOL).	P	
Eugene, OR		Gregory Page 503/687-5017	No						P	

SYSTEM/ LOCATION	MPD MODULE	CONTACT/ PHONE	CAD	ACCEPTABLE FOR TRANSFER	SOFTWARE LANGUAGE	HARDWARE	OPERATING SYSTEM TP Monitor	COMMENTS/FEATURES	CONTACT P=Phone V= Visit	SITE VISIT BY
Grand Rapids, MI	ETS OIS	—	No	Yes— Phase III	ALGOL	B6700	—	System not operational—incomplete documentation.	P	
Huntington Beach, CA	ETS OIS MSS	Capt. Burkenfelt 714/536-5911	Yes	Yes— Phase III	—	—	—	Developed by Motorola. Terminals in squads. Currently developing automatic car location. Software in basic, hardware—upgrading to PDP 1140. Software being rewritten.	P	PSI
Jacksonville, FL	ETS MSS OIS	Bill Calcagni 904/633-3950	Yes	No	—	—	—	Operational for two years. Burroughs 6700 dual processor. Burroughs 9353 terminals. Documentation consists of operator's manual and program listings. Exceeds LEAA for transfer. Purchase price of 5% of development (\$5,000).	P,V	MPD, PSI
Kansas City, KS	ETS OIS MSS	—	Yes	No	—	—	—	Too advanced—too large—not that well documented—system flowchart good.	P	
E. Lansing, MI LEIN	ETS	David Ferguson	No	Yes—Now OIS	ALGOL	B6700	NOL	<ul style="list-style-type: none"> • Basic on-line system • Access to other data bases • Queuing • CCH and UCR • Arrest/Complaint • Accident reporting • Vehicle 	P	
Long Beach, CA PSIS	ETS OIS MSS	—	Yes	Yes— Phase III	COBOL	370/145 776K	DOS/VS	<ul style="list-style-type: none"> • Traffic • Calls-for-service • Investigation • Case reporting • In custody • Resource allocation • Terminal security • Property file • Documentation incomplete • Public safety dispatch—no emphasis on police <ul style="list-style-type: none"> • People file • Identification • Booking • Dispatching • Command & Control • Data base links 	P,V	MPD, PSI
New Orleans, LA	ETS OIS MSS	Calvin Lopex 504/821-2000	Yes	Yes— Phase III	—	—	—	Expanded CAD planned for next 8-12 months. Bid is out for contractor.	P,V	PSI
New York, NY	ETS OIS MSS	—	Yes	Yes— Phase II & III	—	—	—	Too big—20,000 calls one day, 17 precincts. Could use system concepts, flowcharts, etc.	P	
Oak Park, IL	ETS OIS MSS	Robert Bard 312/386-3600	Yes	No	—	—	—	Shared system with 2 other cities approxi- mately 100,000 population. Data General 800 series. In Public Domain, but language is assembly. Developed by Community Technology Inc., Champaign, IL (217/352- 5022). Operational for 1 year. 3 complaint takers, 1 dispatcher.	P	

SYSTEM/ LOCATION	MPD MODULE	CONTACT/ PHONE	CAD	ACCEPTABLE FOR TRANSFER	SOFTWARE LANGUAGE	HARDWARE	OPERATING SYSTEM TP Monitor	COMMENTS/FEATURES	CONTACT P=Phone V=Visit	SITE VISIT BY
Oakland, CA Police Department	OIS	Mr. Steinberg 415/273-3771	No	No	---	---	---	No on-line system--no name file.		
Patterson, NJ PD IS	OIS MSS	---	No	No	---	---	---	No verbal order LEAA Region & SPA	P	
Peoria, IL PD IS	OIS MSS	---	No	No	---	---	---	No verbal order LEAA Region & SPA	P	
San Diego, CA	ETS OIS MSS	Capt. Fortree 714/536-5911	Yes	No	---	---	---	Similar to Huntington Beach. Proprietary. Two months operational. Two PDP-1135's, 96K each. Six disk drives.	P	PSI
San Francisco, CA	ETS OIS MSS	Ed Hartman 415/553-9111	Yes	No	---	---	---	System not documented or fully operational. Software package is available for CAD. Developed by SSDC Corp. Planned for operations when funds for 2 PDP-1140's are available. Current hardware--370/158 shared with city, Comten 45 message switcher, Public Domain. Custom termi- nals in squad cars.	P,V	PSI
Sacramento, CA	ETS OIS MSS	Jack Chandler 916/449-5783	No	No	---	---	---	Just getting started in CAD.	P,V	PSI
Santa Cruz, CA POSSE	ETS MSS	---	Yes	Yes--Now	---	---	---	Developed by Public Systems Inc. (PSI). • Crime pattern analysis • Manpower analysis • Deployment • Encoding • Mapping • Easy convertible package • Completely documented • System 3	P,V	MPD PSI
Shreveport, LA		Henry Cudo 318/226-6111	Yes	No	---	---	---	Operational since Oct. '74. LEAA funded. GE designed two Interdata Model 70's, 64K each. Assembly language 17 Beehive Terminals. Documentation not updated as yet.	P	
St. Louis, MO		314/421-1956	Yes	No	---	---	---	"Flare" system automatic car locator.	P	
Sunnyvale, CA Dept. of Public Safety	CAD OIS MSS		Yes	Yes-- Phase III	---	---	---	Could use system concepts, flowcharts, for subsequent development.	P,V	MPD PSI
Tacoma, WA		John Lomax 206/593-4131	No	No	---	---	---	Will become operational Dec. '75. PRC/ Public Management Services will implement partial Federal Funding. Hardware will con- sist of PDP 11/40 with 2.4 MB Disk (1RK11/RK05), 32K expandable to 128K.	P	

SYSTEM/ LOCATION	MPD MODULE	CONTACT/ PHONE	CAD	ACCEPTABLE FOR TRANSFER	SOFTWARE LANGUAGE	HARDWARE	OPERATING SYSTEM TP Monitor	COMMENTS/FEATURES	CONTACT P=Phone V=Visit	SITE VISIT BY
Tucson, AZ		Capt. Maurer 602/791-4194	No	No	---	---	---	PRC/Public Management Services will be operational in Oct. Proprietary, 2 PDP 11/40's for message switching, 32K each. Will expand to 48K each for CAD, 3RK0 2.4 MB Disk drives for each machine. PDP's interfaced to city IBM 370 and Comtem machine in Phoenix. 60 terminals (regional system).	P	
Tulsa, OK		Mitch Tucker 918/581-5371	Yes	No	---	Honeywell 6040	---	Started operation 2 years ago. Two Nova 840's, 32K each. Honeywell 6040 mainframe. Developed by Applied Automation Co. Documentation needs to be cleaned up. Fortran software.		
Wichita Falls, TX		John McCarty 817/322-5611	No	No	---	---	---		P	

APPENDIX E

INITIAL PHASE III WORK PLAN

WORK PLAN AND SCHEDULE

The MPD work plan and schedule are intended to identify those tasks related to the successful completion of the Technology Transfer Project in the Minneapolis Police Department.

Seven major tasks have been identified. These include:

- Task 1. Implementation Plan Completion
- Task 2. Donor System Final Selection
- Task 3. System Design
- Task 4. System Development and Training
- Task 5. System Testing and Implementation
- Task 6. Documentation
- Task 7. Grant Preparation

Associated subtasks are defined for each of these major tasks in the following pages.

Task 1. IMPLEMENTATION PLAN COMPLETION

The initial task is to create the management structure and to finalize the plan proposed here.

The subtasks are:

Subtask 1.1--Create the Organization Structure. Assignments must be made to carry out the details of all parts of the plan.

Subtask 1.2--Finalize the Plan. This plan should be reviewed by all involved units of the Department, seeking their input and concurrence with the milestones defined herein.

Completion date:

15 June 1975

Task 2. DONOR SYSTEM FINAL SELECTION

Previous drafts of this report have been developed prior to the recent (April) change in direction towards CAD. The report is,

in some respects, incomplete, due to lack of documentation from donor sites, and the previous data developed for other modules is in part no longer considered included in the Technology Transfer effort. Data to complete donor site evaluation must be developed and appended to the report by MPD project personnel when donor activities are completed.

The task provides for culmination of Phase II activities of the Technology Transfer Program. The details of the selection process have been defined in this report. For the purposes of the Implementation Plan, five subtasks have been identified as follows:

Subtask 2.1--Review of Potential CAD Donors' Documentation Completed

Subtask 2.2--Visits to Donor CAD Sites Completed

Subtask 2.3--Analysis of Donor CAD Modules Completed

Subtask 2.4--Budget Preparation

Subtask 2.1--Review of Potential CAD Donors' Documentation Completed. MPD is currently in the process of reviewing documentation of final donor sites for the CAD applications. Technical review of these sites should be completed as expeditiously as possible. The review should include:

- Potential problem areas
- Applications/modules suitable for transfer
- Preliminary cost/time estimates

Completion date:

22 May 1975

Subtask 2.2--Visits to Donor CAD Sites Completed. This task culminates visits to potential donor sites for the purpose of selecting a suitable donor. At present, only a visit to the Charlotte Police Department is anticipated. The completion of this task does not preclude further visits to the selected donor for technical review meetings.

Completion date:

30 May 1975

Subtask 2.3--Analysis of Donor CAD Modules Completed. After completion of initial site visit and technical discussions, a preliminary report should be developed identifying the most feasible modules on application programs. It is not anticipated

that this report will provide detailed analysis of individual programs to allow for programming effort definition.

Completion date:

16 June 1975

Subtask 2.3--Analysis of Donor CAD Modules Completed. After completion of initial site visit and technical discussions, a preliminary report should be developed identifying the most feasible modules on application programs. It is not anticipated that this report will provide detailed analyses of individual programs to allow for programming effort definition.

Completion date:

20 June 1975

Subtask 2.4--Budget Preparation. This task identifies preliminary estimates for use by MPD and LEAA relating to modifications and expected allocation of the original Phase III budget. This budget will be refined later after detailed analysis efforts are completed.

Completion date:

20 June 1975

Task 3. SYSTEM DESIGN

The system design effort is associated with the activities related to both the determination and identification of discrepancies between the donor site software and recipient site requirements.

Five subtasks have been identified within the System Design Task. These include:

Subtask 3.1--Definition of Scope of Effort

Subtask 3.2--Definition of System Modifications for Donor Software

Subtask 3.3--Definition of System Modifications for Recipient Site

Subtask 3.4--Definition of Hardware Requirements

Subtask 3.5--Definition of Budget Allocations

A discussion of each of the subtasks follows.

Subtask 3.1. Definition of Scope of Effort (6 Months). The information processing requirements of MPD far exceed both the

time available and money allocated under the Technology Transfer grant and project. For the purposes of the grant and more importantly, for the MPD, it is therefore necessary to define in detail the scope of the associated six-month effort.

The following activities are included in this subtask:

- Determination of what modules are realistically to be considered for transfer within the six-month timeframe
- Determination of what manpower resources will be committed.

Subtask 3.2--Definition of System Modifications for Donor Software. After a thorough review of the technical systems documentation and the source code listings, the project team (MPD) should develop a detailed breakdown of the program modifications for each of the modules to be transferred. Included items are:

- Program definition and interactive relationships
- Code modifications and purpose
- Estimated time/conversion factors

Completion date:

11 July 1975

Subtask 3.3--Definition of System Modification for Recipient Site. It is anticipated that the transfer of a CAD module to MPD will require changes and modifications to existing dispatch and data collection procedures. It may require development of new data capture and entry forms or formats. These modifications are anticipated as preliminary and will, in all probability, require refinement later. This information will provide the basis for development of training programs and manuals later in the Phase III effort.

Completion date:

25 July 1975

Subtask 3.4--Definition of Hardware Requirements. Investigation of alternative hardware configurations to support the CAD system and other applications has been an ongoing task at MPD. Final decisions as to the exact configuration will have to be made to support budgeting and procurement processes. The configuration will have to specify requirements for CPU, terminals, storage devices, communications interfaces, and all peripheral and auxiliary equipment needed to support the system.

Completion date:

25 July 1975

Subtask 3.5--Definition of Budget Allocations. Upon completion of the previous tasks, the MPD technical staff, along with whatever consultant assistance is required, should develop a detailed cost projection for:

- Donor software modification
- Recipient procedural changes

- Training
- Administrative costs
- Hardware/software (recipient) modifications
- Travel associated with technical transfer.

Completion date:

30 July 1975

Task 4. SYSTEM DEVELOPMENT AND TRAINING

This task provides for the actual development and modification of internal support programs and donor software for implementation of the CAD package. Subtasks identified include:

Subtask 4.1--Program Modification Design Completed

Subtask 4.2--Establish Training Procedures, Schedules, and Assignments

Subtask 4.3--Programming/Conversion of Donor Software Begun

Subtask 4.4--Telecommunication Monitor Modifications Begun

Subtask 4.5--Training Initiated--Procedures and Staff

Subtask 4.6--Dispatch Terminals Ordered

Subtask 4.7--System Application Modifications Completed

Subtask 4.8--Training Completed

Subtask 4.1--Program Modification Design Completed. After review of donor software, the system design reflecting required donor modifications and local software development requirements will be prepared. It is anticipated that both the modifications of the selected donor software and internal software modifications will be extensive.

A critical factor influencing the design will be the determination of front-end communications hardware and software. At present, the decision is between a dedicated front-end mini-computer vs. additional Burroughs communications handlers.

Completion date:

8 August 1975

Subtask 4.2--Establish Training Procedures, Schedules, and Assignments. This task is critical because it is the first introduction to data processing on a real-time basis. Dedicated staff should be established during startup and be totally knowledgeable and fully experienced in training, in the police environment and in CAD. This task will result in accomplishing:

- Development of staff assistance in training
- Development of training standards, including quality control

- Development of workshops and hands-on experiences
- Development of the user manual and update and revision procedures
- Development and adherence to training schedules
- Development of cross training and backup procedures
- Development of refresher and feedback training loops.

Completion date:

10 July 1975

Subtask 4.3--Programming/Conversion of Donor Software Begun.

Based upon the previous analysis, manpower requirements and product schedules, the assigned MPD staff will begin actual conversion of donor software. No modifications in concept are acceptable at this stage, due to the counterproductive impact. Additional interaction with the donor site personnel is expected as this task continues.

Coordination between the training tasks and the actual programming must be totally comprehensive. The previous proven experience of the training officer should influence the design of the human engineering aspect.

Completion date:

25 July 1975

Subtask 4.4--Telecommunications Monitor Modifications Begun.

The human engineering aspects expressed by the training officer should totally influence these programming efforts. Interaction between existing information systems will be included in this task. A critical factor in the successful completion of this task is the full knowledge of the final hardware configuration. Testing on similar hardware will assure completion of this task within the time allocated.

Completion date:

18 August 1975

Subtask 4.5--Training Initiated--Procedures and Staff. As outlined in subtasks 4.2, 4.3 and 4.4, the training will begin.

Full participation by all interactive personnel will be required for support, data accuracy and an in-depth understanding of the intended system. Participants should include but not be limited to:

- Dispatchers
- Calls-for-service clerks
- Division officers (all)
- Senior staff
- Programming staff responsible for system maintenance
- Planning and research personnel

Completion date:

25 July 1975

Subtask 4.6--Dispatch Terminals Ordered. Based upon the lead required by the manufacturer for the installation of the terminals, this time-line may change.

Adequate hands-on experience by the programming staff and the training officer is required prior to exposing the MPD operational staff to training. This will assure a "clean" process to be available to operational personnel instead of debugging completely on a real-time basis and will allow finalizing the training manual.

Completion date:

15 August 1975

Subtask 4.7--System Application Modifications Completed. The system should reflect the precise needs of the department as defined in previous sections and documentation and the interaction with the human engineering aspects of the CAD.

All program modifications should be completed. All methods and procedures should be clearly defined and the operations manual completed. Based upon MPD estimates, the following will be accomplished by this date:

- All programming fully operational
- All training manuals completed for testing
- All operational manuals completed for testing
- All system documentation completed
- Training program fully developed
- All of the above fully approved by senior staff and division officers.

Completion date:

28 November 1975

Subtask 4.8--Training Completed. Using the materials and programs completed in subtask 4.7 and the workshops conducted since 25 July 1975, the operational and management training will be completed. Hands-on experience relative to terminal usage and the creation of the data bases should be completed with this task.

Prototype testing designed to refine the speed and accuracy of the input and output will occur in the following tasks.

Completion date:

15 December 1975

Task 5. SYSTEM TESTING AND IMPLEMENTATION

Task 5 provides for the culmination of technical activities related to program development and implementation of Phase III of the Technology Transfer Project. Subtasks identified include:

Subtask 5.1--Telecommunications Monitor Tested

Subtask 5.2--Dispatch Terminals Installed

Subtask 5.3--Individual Program Testing Completed

Subtask 5.4--Programming Debugging Completed

Subtask 5.5--One Shift Test Operation

Subtask 5.6--System Operation and Training Reviewed

Subtask 5.1--Telecommunications Monitor Tested. Final modifications relative to the human engineering aspects, hands-on training and prototype workshops are reflected in this subtask. This is considered the last of the "fine tuning" necessary in programming.

Completion date: 18 December 1975

Subtask 5.2--Dispatch Terminals Installed. Following the activities in subtask 4.6 determining lead time for installation, the final installation of terminals is made in the dispatcher's office. This is the latest target date acceptable to successfully reach the predetermined goal.

Completion date: 15 December 1975

Subtask 5.3--Individual Program Testing Completed. All application programming tasks must be completed no later than this date to assure an on-line/ready-to-run system when the following tasks are also completed:

- Training of personnel
- Implementation
- Manuals produced
- Communications completed
- Prototype testing
- Availability of hardware

Completion date: 15 December 1975

Subtask 5.4--Programming Debugging Completed. The total system debugging tasks should be completed with this subtask.

With the complete assembly of all application programs and telecommunications, some errors may surface. This subtask allows ten days in which to resolve any eleventh hour errors.

Completion date: 25 December 1975

Subtask 5.5--One Shift Test Operation. With this subtask a fully operational system begins. No program modifications should be necessary due to the comprehensive testing and debugging process that precedes this subtask.

The focus of this subtask is to integrate all previously established methods and procedures. The procedures include the ICN-Individual Contact Number, ITN-Incident Tracking Number and other considerations outlined in previous documentation.

Completion date: 20 December 1975

Subtask 5.6--System Operation and Training Reviewed. The dynamics of an information system demands that perpetual review and modification occur once in a fully operational mode.

Additional embellishments should be considered as demands dictate. Further expansion of applications identified during the survey process should be considered as prime candidates for embellishments utilizing the technology transfer experience.

System review should occur at all levels of operations, programming, training and information needs.

Completion date:

5 January 1976

Task 6. DOCUMENTATION

This task provides for three levels of documentation as related to Phase III activities.

Subtask 6.1--Development of Training and Operations Manuals

Subtask 6.2--Documentation of Technical Programs Transfer and Modifications

Subtask 6.3--Documentation for Consultant Team for LEAA V Phase IV Report

Descriptions of the above three subtasks follow.

Subtask 6.1--Development of Training and Operations Manuals.

This subtask is the result of efforts started in July 1975.

Following the single shift prototype testing, the draft copies of the training and operational manuals will be modified, reflecting the results of the prototype testing. A final printing will make copies available to all participants.

Completion date:

6 January 1976

Subtask 6.2--Documentation of Technical Programs and Transfer

Modifications. Following the prototype single shift test, full documentation will be completed. Reciprocal documentation and/or program modification features may accompany the donor site transfer agreements. Therefore, documentation must include project standards, MPD standards, LEAA standards (below) and potential donor site reciprocal agreements.

Completion date:

15 January 1976

Subtask 6.3--Documentation for Consultant Team for LEAA V Phase IV Report. Following the prototype test and the culmination of previous documentation standards, the MPD implementation staff will provide their portion of the final Phase IV Documentation Report to LEAA for Technology Transfer.

Completion date:

20 January 1976

Task 7. GRANT PREPARATION

This task addresses the problem of program continuation. It is not envisioned that the Technology Transfer Project will resolve all or most of the information processing needs of the Minneapolis Police Department. Therefore, additional block or discretionary funds from the state and federal levels will be necessary to augment city funds and continue the efforts initiated under the Technology Transfer Program.

Within this activity, three subtasks have been defined.

Subtask 7.1--Program Continuance Defined

Subtask 7.2--Budget Establishment

Subtask 7.3--Grant Submission.

Subtask 7.1--Program Continuance Defined. In order to ascertain the level of effort needed it is recommended that, during the implementation of the CAD applications, projections be established for completion or enhancements to the CAD module and other needed police applications. These projections should be prepared in grant form reflecting all requirements of the Minnesota State Criminal Justice Planning Agency.

Completion date:

3 October 1975

Subtask 7.2--Budget Establishment. Following subtask 7.1, this subtask should identify the following at a minimum for ongoing or planned programs.

- Personnel allocations and associated costs
- Contractor costs (if required)
- Hardware costs (i.e., core and terminals)
- Software development/conversion costs
- Administrative costs
- Travel costs (if required)

Completion date:

13 October 1975

Subtask 7.3--Grant Submission. Upon completion of the two preceding subtasks, the appropriate grant(s) should be submitted. It should be noted that the completion of the MPD Automated System Master Plan may provide the capability for earlier identification of programs and submission of grant applications.

Completion date:

28 October 1975

An illustration, Exhibit 4-1, of the proposed project schedule follows.

APPENDIX F

FINAL PHASE III WORK PLAN

[illegible]

END