THE BILL BLACKWOOD LAW ENFORCEMENT MANAGEMENT INSTITUTE OF TEXAS

A JUSTIFICATION AND ACQUISITION METHODOLOGY FOR MOBILE COMPUTING SYSTEMS

A Research Project
Submitted In Partial Fulfillment
Of The Requirements For
The Professional Designation
Graduate, Management Institute

By

Ron Hickman
Precinct 4 Constable's Office
Harris County

August 7, 1995

#329

Table Of Contents

I. Abstract

II. Statement Of Research Purpose

III. Review of the Literature

IV. Statement of Proposed Methodology

V. Introduction

VI. Problem Statement

VII. Approach Phases
- A. Planning
  - 1. Scope of the Project
  - 2. Cost Justification / Benefit Analysis
  - 3. Possible Integration or Interface RequirementsS
  - 4. Local Constraints \ Requirements
- B. Search for Solutions - Design Phase
  - 1. Generating Alternative Solutions
  - 2. Field Personnel Involvement
    - a. Field input / Data analysis
  - 3. Field Trips
  - 4. General Hardware Direction
  - 5. Software
  - 6. Request for Proposal or Request for Information
- C. Development Phase
  - 1. Pilot Projects / Programs
  - 2. Assigning Responsibilities and Delegating Authority
- D. Implementation Phase
  - 1. Measuring Impacts and Monitoring Progress
  - 2. Obstacles To Successful Implementation of Field Computers
- E. Evaluation Phase
  - 1. Developing a Success Model
  - 2. Comparing Goals and Objectives
  - 3. Levels of Acceptance
  - 4. Potential for Full Production

VIII. Conclusion

IX. Bibliography

X. Appendices

I. ABSTRACT

This research paper defines a process and methodology for making specific determinations in selecting areas where remote data collection may be migrated to automated systems. New and emerging technologies provide mechanisms to create a more efficient means for collecting and moving information from the field into computer systems and from remote computer databases to cars in the field. This expanded information and communications capability will enhance the field officer's capabilities and increase his effectiveness. Remote access to State and national databases for field units will also increase their safety factor.

Traversing this complicated and quickly changing field can lead uninformed administrators into a quagmire of technical and vendor related problems. A solid planning base and a good design concept will provide a foundation on which to build and implement a successful system. Deciding on when, where, and how are complex decisions.

II. STATEMENT OF RESEARCH PURPOSE

The purpose of this research paper is to present a well-defined methodology that will enable an agency to plan, develop, and implement an automated remote data collection and inquiry system as a part of a comprehensive mobile computing project. Many agencies have successfully implemented automated information systems for specific functions such as computer aided dispatching, offense report records management, towed vehicle files and various other related systems. Integrating these and future stand alone systems into a comprehensive data collection, storage, and retrieval system is a difficult and complex process.

Retrenchment and budget shortages too often stand in the way. (Abshire, 43) These shrinking budgets curtail the ability of many departments to adequately support activities that

requiring additional clerical support. Backlogged reporting systems, increasing volumes of calls for service, and offense report activity place extreme burdens on existing clerical support systems. Serious delays in field requests for information via radio frequencies cause some departments to target mobile communications to reduce this problem. The capability of many departments to function adequately is totally dependent upon their abilities in the information collection process. Since law enforcement is heavily dependent upon information, improving the data collection process requires forcing automation to the remotest point, where data begins, in the field. The information collected from traffic citations, accident reports, and offense reports have eventual and intermediary destinations. The mechanisms for delivery of this information must be streamlined and improved if any increase in efficiency is to be achieved. The desired result of this paper is to provide a decision making process for law enforcement managers while planning and implementing automated remote data inquiry and collection systems.

The vastly competitive sales and delivery markets demand timely and detailed information from varying levels of field personnel. Both Federal Express and the United Parcel Service can, with an acceptable margin of error, identify the probable location of any package, it's estimated time to delivery, or the name of the person who actually signed for the package. The larger utility companies, such as Houston Light & Power and Entex Corporation, use electronic data collection devices in the field for meter readers. Current resident information and last meter readings are available for verification. Major water vendors, such as Ozarka, provide delivery drivers with hand held computer devices that present billing and invoice information to them for each delivery.

This technology came into play because their corporate strategies focus on the need for timely and specific information to better serve their customers. These strategies were forced into place because of the need for more efficient and effective time and cost saving processes. In a

business environment, cost effectiveness and the efficiency are major factors in the decision making process.

Increasingly, the public demands better service for their tax dollars. Local government leaders will begin responding with similar requirements of the law enforcement community. Without dramatically increasing personnel, our only choice to answer these demands is to improve the efficiency of existing processes and systems. With manual activity largely maximized, only technical solutions can offer the degree of improvements necessary to achieve desired results.

Law enforcement should operate as creatively and efficiently as meter readers and package handlers.

III. REVIEW OF THE LITERATURE

The major resources used in research for this project have come from periodicals directed at primarily technical fields. Publications focused on radio or computer aspects of law enforcement are the only definitive source of documentation covering this area. Due to the specialized technical niche in which law enforcement operates, finding specific information focusing on law enforcement technology is severely limited. This early work in migrating automation to field activities is matched by a void in detailed documentation on how to accomplish the task and what pitfalls to avoid. Periodicals covering law enforcement management issues such as Law and Order or The Police Chief," are often invaluable sources or information or reference materials. Though not readily available, some sources, such as the Police Computer Review quarterly magazine deal with specific hardware and software issues devoted strictly to the law enforcement environment. Another such source is the Technology Assessment Program of the

National Institute of Justice.

In reviewing these periodicals, I find this subject matter receives very little attention. This may be due, in part, to the complex and technical nature of the writing required for this area. The information that is available deals mostly with the capabilities of new technology and the future impacts of these advances on policing in general. Most literature of this type is directed at a more descriptive review of equipment and systems rather than a synopsis of the development and implementation process.

Some information is directed at the processes necessary to automating systems and information management in general. For those agencies still in the infancy of automation, much of this technology is still considered in the same venue of magic as smoke and mirrors. More than seventy-five percent (75%) of law enforcement agencies in the United States are without the advantages of automation. (Pilant, 34) Some references provide direction on where to seek out help in finding specific solutions to problem issues, such as where to find similar computer software used in the private sector or how to locate successful programs in other departments.

IV. STATEMENT OF PROPOSED METHODOLOGY

An active project development in this area in Harris County, a large metropolitan area that with multiple agencies and diverse configurations, provides a good test bed for research for this project. Rather than settling for conventional solutions, the choice has been made to seek the "cutting edge," to provide the most advantageous tools for field personnel use. Much of the research for this project will be primary research, reviewing and searching the market for current and upcoming products and finding solutions that meet the targeted goals and objectives. After

working to identify the specific needs or business problems, a working request for proposal is the next step. Once developed and advertised, it will yield several proposals or bids from which a final bid will be sought. The successful low bidder best meeting these specifications will be awarded the bid. After the bids are accepted, a contract is awarded and a development team will take over to work with the vendor through implementation and evaluation.

In the process, several steps will be taken to meet with field operations personnel and technical representatives to establish a set of general specifications. This identifies the overall requirements from the agency's perspective. Contacting other agencies can provide information where other alternative solutions have been found in similar configurations that meet stated needs and objectives.

V. INTRODUCTION

The activities of most police departments are generic by nature. We collect basic information surrounding offense and incident reports, traffic citations, or accident reports and move this information through the use of a handwritten paper form from one point to another. In other words, in a highly mobile or portable environment we receive, record, and distribute information. This information is compiled and then moved in bulk form to other processing points in the department, particularly by those agencies with automated systems in place. Written offense report information is often faxed or delivered to a district attorney's office and accident reports and traffic citations may be moved from point to point in similar fashion. This information may be entered into various data collection systems such as offense reporting systems, district attorney intake systems, as well as various court system computers. Radio communications systems are seriously overworked and frequency congestion has forced delays in fulfilling requests for

information. According to research on alleviating this congestion, two-way wireless data transmissions reduce delays and frustration over availability of radio frequency transmission time. Radio communication of information through data frees up communications personnel to handle other more pressing situations. (Sandel,18)

The future of technology in law enforcement lies in the mobile computing systems. Laptop and mobile computers will provide an added measure of security and efficiency for the patrol officer. Response time for request for data will decrease from the delays found by voice requests. (Yates, 77) Nothing has more radically changed the landscape of law enforcement, not even the automobile has had a more profound impact on the profession or its operations. (Pilant, 47) Officer safety and productivity are enhanced by the direct benefits available through the use of cutting edge technology. A survey taken at a seminar held in St. Louis of five police departments described the impacts of mobile computing on their operations. Their impacts were directly evident as overall officer productivity increased by fifteen percent (15%) per officer. Overall department costs declined by thirty percent (30%) and effectiveness increased by almost as much. (Rouleau, 23) A study at a recent university police force sought out a means to keep officers more visible to the public by moving the more administrative functions from the station to the patrol car. (Kull, 33)

Rationales for conversion to mobile computing systems may vary, but the acknowledged benefits are limited to a only a few:

1. Increased productivity - Additional resources and tools combine to permit the officer to work faster and manage more activities to increase his productivity.

2. Reduced radio traffic - The load reduction on voice channels moves most requests for information to data channels due to improved speed.

3. Fewer errors associated with human communications - Without translation, error reduction is enhanced.

4. Increased communications security - Most voice channel traffic can and is monitored routinely. Even "trunked" systems are now monitored easily. Data encryption techniques and radio transmissions make it imminently more difficult to "capture" a transmission.

5. Reliable communications - Mobile data systems provide an increase in the reliability of the radio transmission. Error correction and error checking on the radio modem and transmitter equipment permits greater range and reception than standard voice traffic.

6. Improved Officer Safety - Improved communications and reduction of bottlenecks increases the officer's chances that his transmission will get through, even in an emergency.

The number of agencies utilizing computer resources indicates an increased usage of mainframes and personal computers for collection and storage of offense information. Of these, eighty six percent (86%) rely on stand alone personal computers for their information management systems . (Scarborough 1994, 6) This increasing number of departments automating data storage will undoubtably create a future trend towards the need for developing a remote method of data collection and inquiry. The emphasis on shifting towards technical solutions is gradually working its way into law enforcement. A delayed impact of the trend found in the business world which forces the development of these new technologies.

There no doubt are numerous agencies that would be delighted to be able to extend their

automation into the field to the data inquiry and collection process and mobile computing today. As simple as this sounds, the process can be quite difficult and very complex. The fast and ever changing technology in this area can easily overtake even personnel knowledgeable in computer activities. The lag time for governmental agencies acquiring computer systems is routinely behind the technical curve in advancing computer technologies. By the time many departments have geared up to acquire new technology, it is already obsolete. Software and hardware on the low end of the spectrum is outdated after about eighteen months on the market. (Radio Communications July 1995, 74) This fast pace leaves many departments at the mercy of computer vendors or computer and communications consultants and while they can be an important element of the overall process, it is important for departments to be have knowledgeable personnel involved and active in all phases of the project. The eventual ability to understand and operate the data collection environment will fall heavily on the agency. Without this knowledge and ability, the agency will be forever tied to consultant or vendor maintenance and support contracts.

In order to approach this process in a analytical fashion, we must first organize the project into manageable units and detail each for clarity. Attachment F segments the process into individual phases and provides an overview the steps necessary to reach completion. Each area is expanded considerably, depending on the magnitude of the problem and volume or activity.

To determine the extent the project will justify the search and cost of a solution, we must first analyze and investigate the problem. Some situations prove to be temporary in nature or have very localized impacts. Automated solutions often prove to be very labor intensive and expensive in terms of acquisition and start up costs. Temporary of small impact problems may not warrant the investment. Alternative solutions may resolve these types of small or interim problems in another manner. Establishing control and authority for the project will follow as will planning

and research for the project.

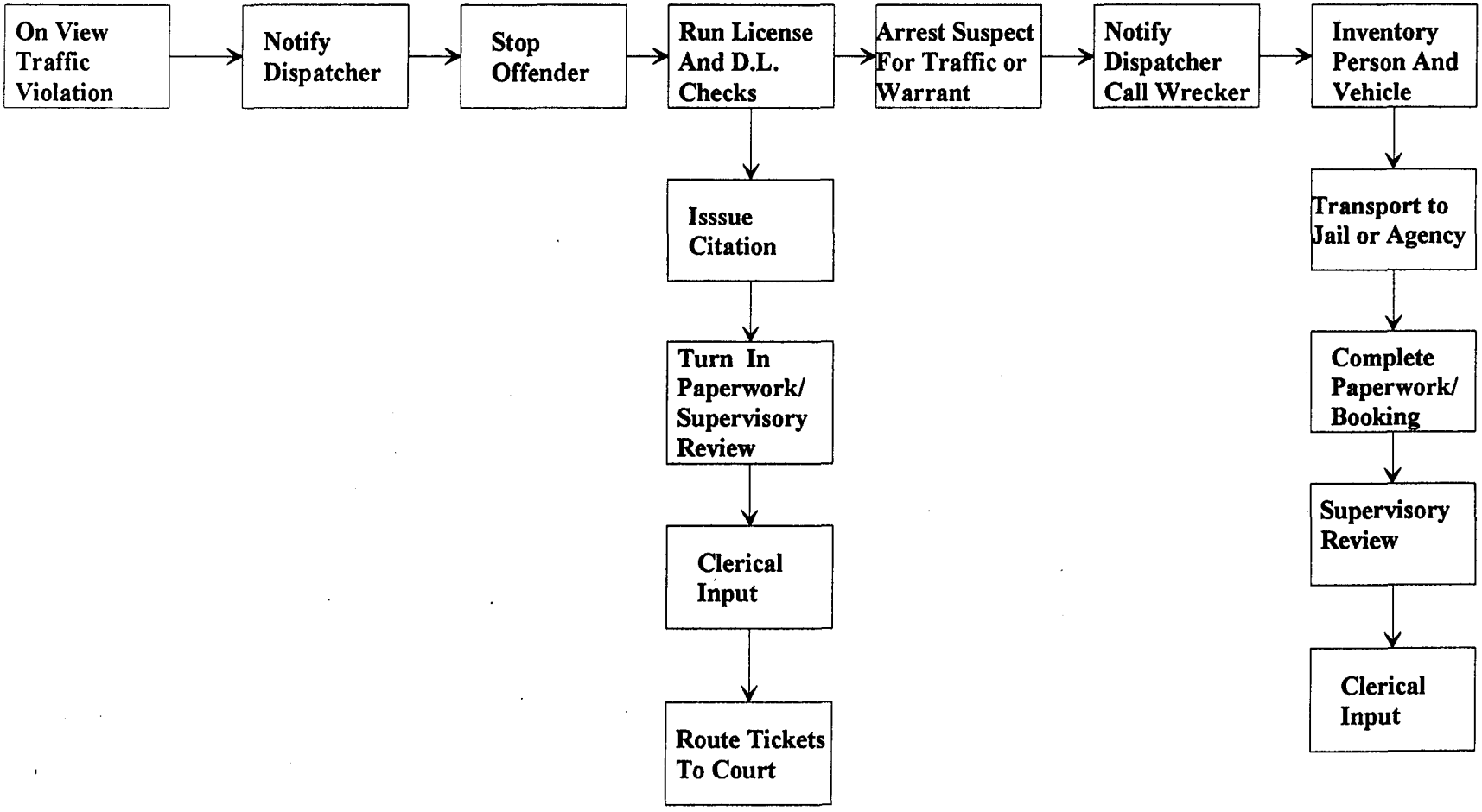
After reviewing the analyzed problem and determining the extent to which it will be justified, a decision then must be made as to the scope of the project. This will essentially determine the targeted areas or specific business problems to be solved. The next step will be determining if the potential overall cost can be justified by the offsetting benefits to be provided by the project. In-house research and investigation will identify the targeted objectives and then the search for solving the business problem will begin. This process starts with a search for alternative solutions. Before settling down to a decision on automating in a specific manner, brainstorming or round table discussions might provide unique possibilities. Involving operations personnel in the process will ensure their perspective is included and their acceptance is most likely assured. Field trips will aid in finding established or installed solutions.

Once a fair understanding of the available solutions has been established, both hardware and software platforms may then be determined. The kind of computer system and general programming language to be used are exceedingly important aspects of the process. All these elements will then be blended into a Request for Proposal or Bid Specification. Receipt of the bids calls for an evaluation and development process and leads to an eventual implementation phase or even a pilot program.

VI. PROBLEM STATEMENT

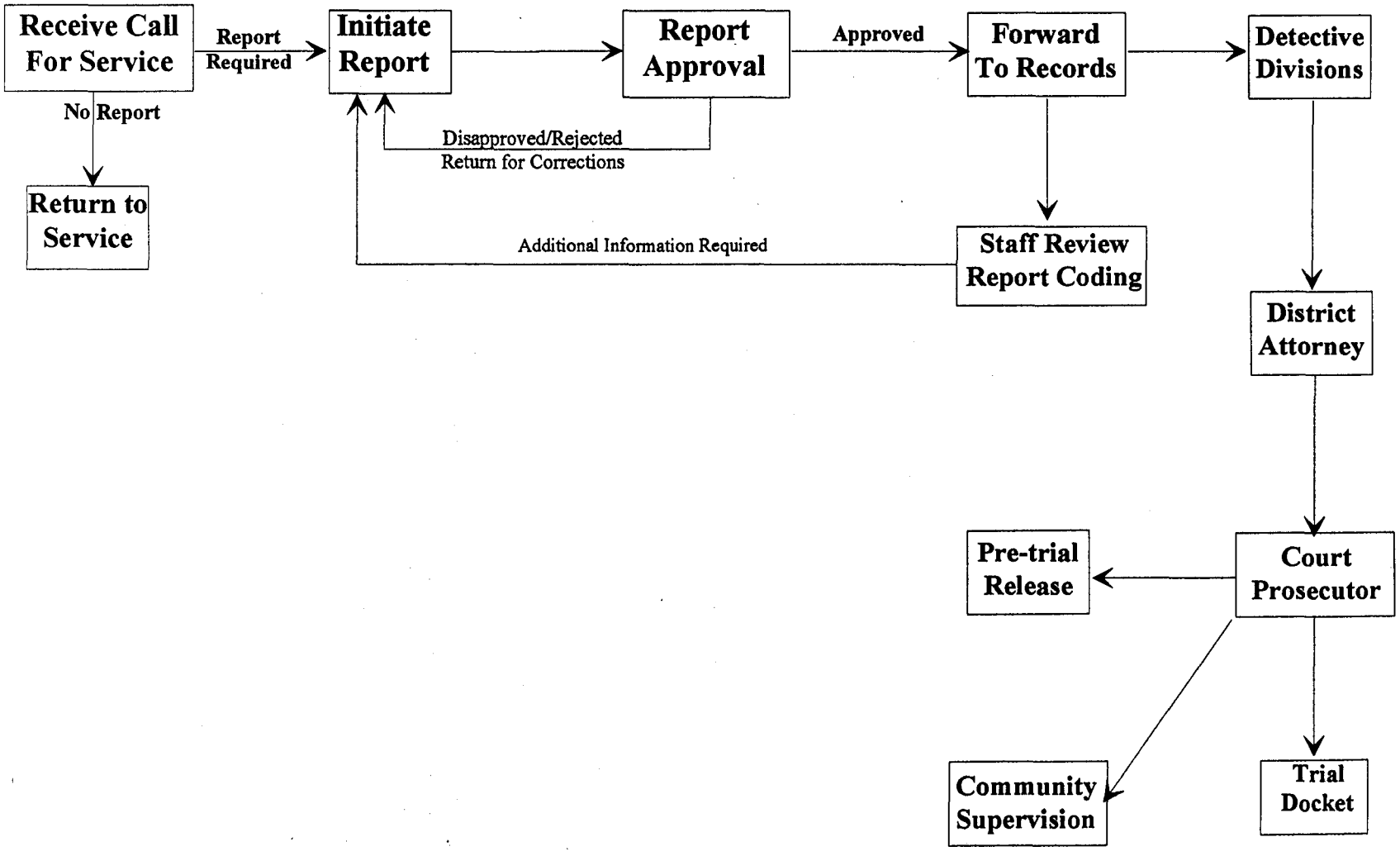
The specific problem associated with data collection has always been the ability of agencies to efficiently collect information and make it readily available to those eventual and intermediary locations. For those agencies with automated records systems this means data entry at some level and entry personnel sufficient to meet the incoming volume of report activity. For those agencies

Patrol - Traffic Stop



Attachment A

OFENSE REPORT - PAPER FLOW



Attachment B

without computer systems this will mean tabulating log sheets and filing manual reports into a cabinet. For many agencies, increasing volumes of offense, accident, and citation activities have increased to exceed the capacity of existing clerical staff. This means backlogs and delays in various processing activities. Statistical reports are harder to get and crime analysis is virtually worthless due to the long delays before information can be made available. Traditionally, interim solutions are sought which invariably seem to shift the backlog to other locations down the line. Large stacks of offense reports pile up awaiting filing or data entry and requests for information or statistical reports are almost impossible to complete. To maintain the availability of information a decision may be made to have each officer or deputy enter each of his offense reports into a computer system directly himself, thereby eliminating the delays caused by insufficient clerical personnel. This solution, while effective in providing the maximum in information availability, is very expensive in terms of manpower time lost from the street. An internal study, or pilot review, of this process indicated that it cost approximately fifty thousand dollars ($50,000.00) a month in terms of lost time. This equates to approximately ten field positions that could be recovered by finding another alternative.

The obvious solution to the situation would be to create a mechanism that could serve as a device suitable for data collection for the three primary data activities, offense and accident reports as well as traffic citations. In order to develop a smooth installation of a remote data collection and mobile computing solution, there are several key components; planning, design, implementation, and evaluation. Each of these steps must be approached thoughtfully and cautiously. There are serious pitfalls in each that can potentially erode the success and effectiveness of the project.

VII. APPROACH PHASES

A. Planning

Possibly the first and most important of the steps is to determine the level of support for your project. For some reason, unfunded projects go nowhere. The initial part of the planning phase should involve the preparation necessary to build a strong support base from your local department and government leaders.(Pilant, 31) Some experts use a cost benefit analysis to show officials exactly what kind of savings and efficiency increases can be expected. (Pilant, 32) Determine the root of the problem through a workflow analysis that points out the root of the problems and identifies specific bottle necks. Problem resolution will assist in cost justification and payback estimates. Costs estimates place increases in productivity at an average of fifteen percent (15%) per vehicle with a one year payback based on a single shift usage. (Rouleau, 25)

The planning phase of the project is by far the most critical and commonly underutilized segment of a complex project. In real estate, they say that location is everything; in technical projects, planning is everything. It's importance cannot be overemphasized because the subsequent phases are totally dependent upon a solid planning base. In order to approach the project in a logical and intelligent fashion, the planning stage must be organized and structured in such a manner so as to identify all areas involved and personnel and process affected. Seek out knowledgeable personnel within the department or solicit input from local vendors to build an information base from which a solid design or blueprint can be developed.

If knowledgeable or experienced personnel do not exist or are not readily available for

assignment, a qualified expert or "consultant" may be called upon to assist in developing a good plan. In technical projects this would not be at all uncommon. In order to build a system as complex an information collection project, a good conceptual design is the best first step you can take.

1. Scope of the Project

The scope of the project will be determined by the benefits or justification of the project. This information will be based on solid research into the specific business problems to be targeted, such as delays in providing offense report data, backlog of data entry, electronic transfer of citation data, or just a remote inquiry tool. The specific software application and hardware solutions to be sought will be guided by the mixture of targeted business problems. Expansion of applications or peripherals should be limited, at first, to specific priorities that can be delivered in a reasonable amount of time and within budget expectations. This will provide an application and hardware platform that can be built upon as the basis for future expansion. Once the decision has been made as to the identity of the specific areas to be targeted for data collection automation, some person, group, or committee should be charged with the responsibility for the research necessary in the Cost Justification / Benefit Analysis Phase.

Identifying the scope of the project involves determining milestones and objectives that will make the project a success. Selecting an achievable set of goals, is essentially setting your sights on a target that is most probably possible. For agencies with small computer systems, this goal may be simply collecting the data in the field on a laptop and transferring it to a personal computer in the office at the end of the shift. For others this process may involve solutions as complicated as transmitting the traffic citations, towed vehicle information, or other short bursts

of data over the radio frequency and modem transferring report information over the telephone lines. Either way, the solution must fit in with the long term vision of the agency.

It may be appropriate, depending on the size of the overall project to break implementation down to manageable segments. A phased approach provides an opportunity to review individual components of the system for success. It also reduces the immediate impact on budgetary items and may be the only way to sell the overall project.

2. Cost Justification / Benefit Analysis

Each step of the existing processes should be identified and documented. Flow charts that depict the logical path of information for each area should be developed to detail which intermediary and eventual repositories of information will be affected. These flow charts will assist in determining, from a visual perspective, how the automated process should emulate the existing manual system. It will also show specific locations where information must be delivered and whether or not a process must be changed to accommodate the automated collection as well as the division, departments, or groups that will be affected or should be involved. Attachments A and B depict in typical flowchart style, the process flow of paperwork and delivery process. From this graphical representations, the cost of each step in the process could be calculated. This will provide an overall budget total to ensure adequate cost justification for the change to automation. This must include time expended, materials, and hidden costs, such as consumables. By automating the individual processes there should be a considerable time savings from the standpoint of initiation of the document, as well as the time saved from transporting the document to other locations for computer entry. Within this process, however, other costs should be identified. Additional training, personnel, or other areas where expenses may be found should be

searched out as well. Simply automating processes should not necessarily be regarded as a means of overall cost savings. By automating a process, the workload has simply shifted the focus to a new function. The focus will be off of report backlogs or data entry and moved to quality control or other technical issues or areas.

3. Possible Integration or Interface Requirements

One of the serious considerations that must be given is to the eventual computer interface requirements necessary to integrate the data collection system to other local computer systems, if this is one of the chosen targets for your project. The ability to transfer data collected electronically to local databases will ultimately rely on this interface. Typical types of midframe or mainframe computer interfaces would be LU6.2 or TCP\IP connections. The specific interface requirement will be determined by the system to which you will eventually connect.

Another interface component that requires equal research and technical expertise is that of the radio system. Linking the radio system to the computer system to provide a true remote data link for computer inquiries and data transfer is a complex process. With conventional and trunking radio systems and particular radio system protocols, working with your radio system can be a particularly thorny problem. Early preparation should be taken to consider radio frequency licenses for either pure data or combination data and voice traffic. The license process through state frequency coordinators and the Federal Communications Commission issuance is a lengthy and time consuming one. Frequency loading must be estimated to ensure compliance with the minimum loading requirements per frequency intended for license. The usual requirement is seventy five (75) units for each frequency.

The interface mechanism that connects the remote data collection computer to the radio

system will be some version of a radio modem or built in radio transmitter. The purpose of this device is to provide the conversion of the radio transmission protocol to the computer's digital language and act as the switch to open and close the radio transmitter. It may be a part of the same physical unit or a separate part. Either configuration will work, but the determining factor for selection of this unit will be the specific protocol required by the radio manufacturer. Each of the major manufacturers usually builds a proprietary protocol into the radio and radio modem units to ensure specific compatibility. Before selecting an interface unit, some specific research must be given to the areas involved. Compatibility with the radio system is another of the critical components in the remote data collection system. Data transfer abilities depend on it.

There are few options in selecting the carrier for this type of data system. In some areas, there are private vendors that support digital cellular systems that can handle data transmissions for mobile computing projects. In some cases, cellular digital packet data, or CDPD is commonplace. This type of system is found to be more cost effective and less complex than building a mobile computing radio backbone funded and maintained by a unit of local government. The list of companies supporting CDPD is growing. AirTouch, Ameritech, Bell Atlantic, Bell South, GTE, McCaw, NYNEX, and Sprint Cellular are just a few of those supporting cellular systems in the private sector. Confidentiality of information is increased with digital addressing. Electronic serial numbers are automatically confirmed before accepting transmissions to and from remote computers. (Clede, 40) The digital encryption of data and specific protocols reduce eavesdropping considerably.

4. Local Constraints \ Requirements

Interfacing with or integrating to other computer systems will involve decisions on the

types of restrictions placed on the interface by existing systems, programming languages, or computer platforms. Research into the specifics of these requirements will be an integral part of the planning process. The ability to communicate across differing computer platforms or using an Open Systems concept of conversing with other programming languages on various systems will be important to the overall solution. There may be a specific need to obtain or transfer data among several different departments within a city or county government. A County Clerk or City Department may contain property owner information, tax, or lien records that will prove useful to investigators. Access to this information and other similar types of data must be considered as a local constraint or requirement. Compatibility with other systems will ensure that access to differing and external computer systems can be accomplished.

B. Search for Solutions - Design Phase

1. Generating Alternative Solutions

The search for solutions to resolve specific problems involves considering a number of alternative choices or options. From the simple to the outlandish, all manner of possibilities should be explored. Sometimes the inconceivable can be the best solution once the obstacles are cleared out of the way. The ideal solution may involve combinations of manual and electronic processes or purely electronic. The only limits to finding solutions should be the limits of funding and innovative thinking.

2. Field Personnel Involvement

Without involving field personnel, acceptance of any product or service is a difficult

venture. Developing systems, tools, or resources in a vacuum, is a project doomed to failure. By involving the personnel for whom this data collection tool is to be developed, you can almost ensure that they will find the outcome more favorable. In order to accomplish a reasonable review of the types of resources and tools necessary to accomplish remote data collection, field personnel familiar with the task must be an integral part of the project team.

A. Field personnel involvement

Input from personnel with experience in collecting the types and quantities of data selected as the target for your project can help to identify the types of data and their subsequent relationships. Sample products and forms will assist in researching suitability to the operating environment. Review input documents and data from this area to determine your data flow and process needs. These tools will help define the kinds of solutions which may be acceptable.

3. Field Trips

Field trips will help to review existing systems installed with the same or similar configuration to ensure a match against your local design requirements and to investigate potential solutions. Interviewing personnel from each site at the technical and operational level of the system or process will assist in determining the level of acceptance and applicability. Local requirements or restrictions on vendor supported or provided trips must be considered to avoid conflicts of interest.

Select carefully the sites you plan to visit. Each location has to be similar in configuration and processes for its evaluation to serve any purpose. There are many very sophisticated systems

that appear outwardly to be the ultimate in automation, but in the end require so much modification to meet your local constraints that it may no longer be cost effective.

4. General Hardware Direction

In most cases an agency has a reasonable estimation of the problems associated with their data collection processes, but little knowledge of the possible or probable technical solutions available in a fast moving development market. Many cases may require searching out information at trade shows or technical conferences and expositions. For smaller to mid-range systems, some periodicals carry information that detail new and emerging technologies as well as currently installed systems that will meed those needs quite well.

After a complete review and study of the integration and interface requirements, some decision has to be made as to the general hardware direction the agency desires to take. This may be determined by a support services availability or it may be determined by the kind of system to be developed. In some cases a mid-sized Unix or Novell based network may provide the speed and flexibility to manage and expand the system for years to come. Powerful desktop devices have added a new dimension to local processing power and in many cases are being integrated into the network environment and attached to gateways and mainframe systems. The open systems concept of the corporate sector is beginning to invade local governments and has created new doorways for access to information on a variety of different platforms. The specific hardware platform or direction should provide this consideration and be prepared to take advantage of it.

The overall communications and network configuration will be a central question in the design phase. In order to provide vendors and data services personnel some general idea of the concepts for this configuration, a rough blueprint or layout is required. Attachment D depicts

a rough configuration indicating the ideology used for connecting remote sites on a fiber optic network to a central server. Attachment E identifies the configuration for one of the specific sites and just how many devices will be placed and in what manner they will be used. Attachment G identifies the mobile communications connection through the radio system to the computer system. Each of these diagrams provide a visual overview of the components of the physical system.

The agency will have a good idea of the types of field devices in which it has a general interest and those that may find acceptance in the field. The type of device to be selected should meet some pretty stringent specifications and be designed for and built to work in a police or military environment. A vendor may suggest converting a portable device, or modifying one to meet your requirements. This device should that also be capable of acting as a communications terminal and multi-tasking through various software applications while maintaining a high degree of portability. The device must have an acceptable degree of ruggedability and be suitable to the mobile environment. In a test of twenty computers, Washington State Highway Patrol found none of the standard laptops were suitable. (Aden, 18) Converting a laptop device to a mobile environment may not be the appropriate or only answer. The portable computer arena is currently the fastest changing environment. In just the short months necessary to compile this information, equipment changes have begun to eliminate the requirement for external radio equipment for mobile computing. In the years to come, the old style mobile data terminal, commonly referred to as the "MDT" will be obsolete.

5. Software

The software language utilized for the system proposed may be specific hardware like Unix, Mapper, or Model 204. The operating system language and the application language may

not necessarily be the same. The operating system may support other languages as well. Just as Novell support DOS programs. Your own agency's ability to support or expand the system acquired is an important element in determining what your preference in software language will be.

Long term growth and maintenance will be tied to the vendor in a support maintenance contract or warranty service if the agency does not have in-house technical support. The experiences of many departments has indicated that once a system is developed, the growth of the capabilities of that system becomes an issue of immediate interest to the user community. Once new functionality or resources become available, they will want more and better tools. System usage and interest will increase in linear fashion and soon users will be asking for more and more functionality.

Communications software that will perform the radio interface and emulate radio transmissions will be especially important in compatibility with the field or portable device. The radio system will use specific software to communicate with the radio modem attached to the laptop or portable computer. The functionality provided on the computer will have to emulate , or act just like that of standard mobile data terminals historically used for that purpose. In order to accomplish this task, the software must interact with the radio modem and open and close the switch to the transmitter and receiver in the radio component. The software performing this function will have to work with the radio protocol, radio transmitter, or modem components very well, in a high volume environment to become effective. It is this functionality that will ultimately permit the officer in the field to extend his access to remote information sources, such as state drivers license and vehicle registration databases.

6. Request for Proposal or Request for Information

While in some cases, the choice of system or hardware may be determined strictly by local integration or interface requirements, still others may require advertising requests for proposals commonly called an RFP or a request for information commonly called an RFI . Either process will permit an agency to advertise their specific needs and seek solutions from the vendor market . The RFP is a general description of the business problems to be address and of the environment in which the system is to operate. The request usually begins with a fair amount of legal language and specific purchasing requirements of the local government entity, followed by a general description of the types of solutions sought. Some of the technical specifics, if they are available, usually define the general hardware platform or software language(s) desired.

The RFP is where the creative juices can really start to flow. This is the biggest wish list that you can possibly imagine. The more innovative your people are at this point, the better your potential system will be in the end. With technology moving and changing so fast, it is difficult to things that are not possible at this point. Heads up data display can be projected on the windshield or other location in front of the drivers face. Automatic vehicle location systems use satellite technology and global positioning to pin-point the location of each patrol car, within a hundred feet. (Yates, 80) Matching the location with satellite coordinates to the location of a call for service permits software within a computer aided dispatching system to select the closest in-service unit to assign to a call. High speed radio transmission and data compression routines has made it possible to display graphics for maps and photos in the patrol car or portable computer. Magnetic stripe readers can pick up data from drivers license and bar code readers can pick up vehicle identification numbers through the windshield. New trends in miniaturization are compressing computer and radio transmitters into the same unit small enough to hold in your

hand.

Technical reviews indicate major manufacturers are beginning to push technology toward law enforcement applications and hopefully we can soon be the benefactor of some pretty sophisticated technology. Creative thinking, some technical research, and a fair amount of phone calling will give you an idea of what is possible in the technical realm for your specific project. It all needs to go on your functionality list.

The last and possibly most important part of the RFP is the description of the evaluation of the package and vendor. A specific evaluation criteria will help an agency weed out questionable proposals and assist in final bid development. Once the RFP has been advertised, in most cases the response brings vendors out of nearly every corner. They may range from large corporate vendors to simple built-in-the-garage types with little to no installed customer base. It is here where the product and proposal evaluation becomes critical.

Also a pre-bid conference with vendors will also help to further define the scope and dimension of the project, the specific needs to be met, and the arena in which vendors are expected to operate. This process helps to avoid misconceptions created by a printed proposal or any confusion due to a lack of specifics in technical areas. Each side can raise questions that may clarify some of the specifics necessary for a more complete bid or proposal.

A solid and documented process for evaluating the proposal and/or equipment proposed will facilitate a smooth installation at a later time if the agency and the vendors work together in detailing how the proposal will be reviewed and following that evaluation design in all cases.

In selecting a software company or prime contractor consider the following:

1. Get as much background information on the company as possible to ascertain the viability of the company and its experience in providing solutions similar

to yours.

2. Find out as much as possible about the vendors key people.

3. Evaluate the company's financial situation.

4. Verify the number and experience of the company's technical support staff against the software and systems proposed.

5. Check their references and visit installed user sites. Talk to users about difficulties they experienced and what if any changes they would suggest. (Pilant, 31)

Attachment C is a draft of a request for proposal that details the specifications desired for a mobile computing system. It is most probably more detailed than is necessary, but it helps to give the vendors a good working knowledge of the task to be accomplished. It certainly reduces the number of telephone calls to answer questions later.

C. DEVELOPMENT PHASE

1. Pilot Projects / Programs

Whether the project is a large complex one with several individual segments or a small project involving limited personnel, equipment, or resources a decision has to be made as to whether a pilot will be necessary to serve as a proof of concept or blueprint design shakedown. In many cases, the concept may already have been proven in other departments and only need justification for it to meet your local needs. This ability of the vendor to participate in a pilot project may be included as a part of the final bid process and it should give the agency an opportunity to evaluate the equipment and success of the match of the combination of hardware and software components. A specific time frame and environment should be determined and

closely monitored for compliance with specifications and evaluation criteria. The specific working environment may have a direct impact on the mobile equipment selected and the pilot may be the best, or only way, of determining whether the equipment is suited to portable or vehicular activity. Vibration, heat, and radio frequencies can play havoc with liquid crystal screens as well has a high degree of harsh treatment.

2. Assigning Responsibilities and Delegating Authority

In large or small projects, there are usually so many components involved that it may be virtually impossible for any single person to maintain total control over all segments of the system implementation. It may be appropriate to delegate this responsibility or authority to other personnel to track or handle specific activities. The documentation trail on the project milestones and installation time line is a job for a person with strong communication and documentation skills. The person who is responsible for dealing with the vendor representative, or prime contractor, needs to be a strong authority figure and someone familiar with purchasing and technical specifications.

A representative of the field personnel should be assigned the responsibilities associated with documenting acceptability of the hardware and software solutions and whether specific problems are being addressed or solutions found. Each of these responsible individuals acts as a funnel or focal point to direct information to a central collection area.

D. IMPLEMENTATION PHASE

1. Measuring Impacts and Monitoring Progress

Once the pilot project, if used, has proven the concepts and design principles chosen for the system, the overall impacts in each of the target areas must be measured for cost justification and effectiveness of the overall solution. The original motives for target selection and goals and objectives must be kept in mind as well as meeting time lines and milestones. Each little success builds to add to the success of the total project. Each component of the project should be documented and a history of the system developed to determine whether contractual obligations have been met and if documented problems have been resolved along the way.

Monitoring the progress of the implementation must also include searching for adverse impacts as well. If the system proves to be too expense or not cost effective, other solutions may be necessary. If the functionality is not provided within the solution selected, another route or set of options may be required. During this period, a strong involvement of field personnel should help facilitate a good two-way communication of the problems and assets of the installation as well as the overall success of the project. The field personnel are essentially the target audience and can most easily tell you whether or not you are meeting your objectives.

2. Obstacles To Successful Implementation of Field Computers

A number of specific obstacles to successful implementation of field computing were identified by the Law Enforcement Information Management Section of the International Association of Chiefs of Police as a part of their symposium on information management. In summary they were:

A. Funding - Probably the largest single obstacle to successful implementation is adequate funding for the project. Projects of this magnitude require a considerable investment in hardware, software, and communications systems.

B. Changing Technology - The fast pace of change in technology leaves many waiting for the right place to jump in.

C. Standards (Data and technology) - The lack of specific standards in manufacturing and implementation causes departments to wonder whether the information they need can be produced from the data they gather.

D. Lack of law enforcement coordination/involvement in private sector computer market - Many departments purchase equipment not designed or directly suited to department of management needs. Vendors are not governed by any common criteria and the law enforcement market creates only a small niche for sales.

E. Making informed decisions - System acquisition decision involve complex technical and compatibility issues for which they may not be routinely informed or equipped to make.

F. System design/upgrade/compatibility - Frequently agencies are required to follow mandates of organizations that are not informed about the expanding role of computers in law enforcement. A blueprint for basic systems design, equipment upgrading, and future compatibility must be established to assist agencies without technical staffing.

G. Education/training - New systems require extensive training for department personnel, operations technicians, and senior management staff personnel. Failure to provide for these impacts will cause a good system to fail.

H. Need for strategic plan - This blueprint will provide direction and support for complex projects that are hard to visualize and understand.

These obstacles, and many more, can interfere with the development and implementation of field computing systems. They can be complex and confusing projects and by their very

nature difficult to explain or adequately justify. (Police Chief January 1995,32)

E. EVALUATION PHASE

1. Developing a Success Model

In order to determine how well the project suits the agency's expectations, an evaluation model should be developed to include what elements are necessary to achieve success with the project. Key personnel assigned as focal points in each area should be an integral part of the communication process and all reporting points documented. It is important the ultimate result of the project be directed by the success model. It will be necessary along the way to compare intermediate points against that model. Watch carefully during the installation and evaluation phase to ensure what changes, if any, your vendor will be making to the system. Watch for vendor activities that should be training that actually turn out to be on-site modification to tune the system to meet performance standards. (Pilant, 45)

2. Comparing Goals and Objectives

The success model, the original targeted goals and objectives, as well as the specific milestones, will be a point of constant comparison. Measuring the temporary successes and failures of individual components against each of the selected targets will go a long way towards guiding the project towards full a production system and eventual success. The model will act as the gauge against which the evaluation should be compared. Individual milestones and intermediate tasks should help in providing a measurement of the overall process.

3. Levels of Acceptance

Each area affected should determine the common level of acceptance for their respective area. The functionality, reliability, and durability should meet the standards of field personnel, technicians, and administrative personnel. The long term evaluation of the process should determine whether or not the system and its varied components meet with the needs of the users as well as fulfilling the original requirements determined in the original problem analysis. The levels of acceptance may vary from one location or assignment to the other and the agency should be prepared to deal with inconsistencies in the acceptance levels of differing assignments or environments. The overall or average acceptance level or the target functionality should determine success.

4. Potential for Full Production

If the system matches against the success model and has fulfilled the goals and objectives set forth it should meet the criteria for general acceptance by the user community. Having accomplished these areas successfully, it should be possible to gain the support necessary to move the project into a full production environment and eventually replace the targeted manual systems. Documentation should be available that certifies the intermediate milestones and meet cost justification expectations. The cost benefit analysis that was developed in the beginning as cost payback justification should be reviewed and comparisons made as to their accuracy. From this the overall budgetary requirements for full production can be estimated. The completed package should provide enough ammunition to sell the final phases of the production system.

V. CONCLUSION

At the end of the project, the department should have a good handle on the potential for a remote inquiry and collection system and be aware of the management and maintenance requirements. As the agency begins to take ownership for and responsibility of an automated system it must have a good understanding of how it works and what the impacts will be to all segments of the organization. It should provide specific benefits and have demonstrated results towards the targeted objectives. This kind of project is a self-education program where learning is an integral part of the development process. Developing in-house expertise is providing insurance against future problems and reduces the agencies long-term dependence on outside vendors. (Pilant, 39) This will permit the system to expand and grow with the agency without the painful exercise of repeating the entire process all over again.

This process is designed to reduce entanglements and assist in overcoming obstacles that delay and inhibit successful completion of the project. An informed manager can sidestep those thorny issues that both cloud and confuse large or technical projects. The only successful project is a completed project.

A number of imaginative agencies are investing in researching the potential of technology in mobile computing for law enforcement. Marlin Crouse, being interviewed in a recent article is quoted as saying, Technology is here to stay. We can choose to buy is wisely - or not. (Cannon, 42)

Bibliography

Abshire, Richard. Community Policing + Technology = 21st Century Policing Law Enforcement Technology October 1995: 43-52.

Aden, David. Traffic Jams No Longer Mean Radio Jams Government Technology August 1995: 19

Cannon, Jerry. Technocar 2000: The Car of the Future Law Enforcement Technology November 1994: 43.

Clede, Bill. Cellular Digital Packet Data: CDPD Law and Order February 1995: 40.

Field Use of Portable Computers The Police Chief January 1995: 32-37.

Fighting the `O' Word, While Keeping Radio Equipment Current Radio Communications July 1995: 74.

Kull, Lois. A Trio of Mobile Data Applications Radio Resource Magazine May 1995: 33.

Pilant, Lois. Information Management The Police Chief January 1994: 31-45.

Pilant, Lois. Automating Systems The Police Chief July 1995: 31-39.

Rouleau, Robert T. Mobile Computing Systems Are The Future Law and Order February 1994: 23-25.

Sandel, Rod. Two-Way Wireless Data Enhances Communications Law and Order February 1994: 18-22.

Scarborough, Kathryn. Information Management Systems Survey TELEMASP Bulletin November 1994, Vol. 1, No 8.

Yates, Tom. Magic Patrol Cars Law and Order April 1995: 77-81.

Draft of - REQUEST FOR PROPOSAL FOR MOBILE COMPUTING SYSTEM FOR HARRIS COUNTY PRECINCT 4 CONSTABLE

The following requirements and specifications supersede General Requirements where applicable.

If you need additional proposal information contact _____ at Harris County Purchasing. Technical questions concerning mainframe issues should be addressed Mr. Jimmy Ray, Director, Justice Information management System (713) 755-5398. Questions concerning issues about radio interface and switcher software/hardware should be directed to Mr. Larry Orr, (713) 755-8386. Questions concerning Agency procedures, mobile computer equipment or software configuration or use and processes should be directed to: Assistant Chief Ron Hickman, Harris County Precinct 4 Constable (713) 320-3255.

1.0 REQUEST FOR PROPOSAL PROCESS

Transmittal Letter

Vendor Instructions

Responses to this request for proposal shall be formatted as follows:

All proposals must be typed on standard 8 ½ X 11 paper, indexed and placed in a binder or folder. The vendor's responses, proposed cost forms and proposed hardware, software and service schedules should be enclosed within the proposal. All items whether required or optional must be priced. The complete proposal should be sealed in an envelope or box for delivery to the Harris County Purchasing Agent per instructions in the general requirement (see returning the proposal and proposal completion). All documents included in the request for proposal response and the outside of the envelope and or box must be labeled with the vendor's name and the job number which corresponds to this request.

Each proposal shall be organized so as to respond to each question or specification listed in the request for proposal. The vendor should follow the proposal sequence and format, stating the question or specification followed by the response. A response must be provided to every question specification. A response must be provided to every question or specification.

The vendor's response to the questions and specifications are critical to the evaluation. The questions are structured to allow the vendor to explain the benefits of the system being proposed. While Harris County appreciates a brief straightforward concise reply, the vendor must fully understand that the evaluation is based on how well the vendor provides the information requested. Merely stating an understanding of, or compliance with, the specification is not adequate.

Responses must reference vendor supplied technical material or provide detailed technical descriptions which substantiate the response. References must be specific i.e. page, paragraph and line number. The vendor must supply the manufacturer's documentation and technical references which validate that all of the requirements and specifications have been met. This documentation must reference by page and paragraph the specific requirement(s) or specification(s) to which it applies.

Other materials which may improve the quality of the response should be included as items attached in a separate appendix.

Accuracy and completeness are essential. Responses which include omissions and ambiguous or equivocal statements may be construed against the vendor. The proposal response may be incorporated into the contract resulting from this RFP. Vendors are cautioned not to make claims or statements for which they are not prepared to commit to contractually. Failure by the vendor to meet such claims will result in a requirement that the vendor provide resources necessary to meet submitted claims.

The vendor is expected to examine all documents, forms, specifications, standard provisions and all instructions. Failure to do so will be at the vendor's risk.

All proposals must provide cost figures in detail. All costs must include separate costs for all items proposed. Current and complete cost details must also be included for all phases of the project.

The vendor may designate portions of proposal which it believes to be exempt from disclosure under Texas Open Records Act (VTCS Article 6252-17a). Such data shall accompany the proposal but be clearly identified as confidential and readily separable from the proposal. After award, each proposal, except for those portions which the bidder has designated confidential and which are exemptions as defined by the Open Records Act shall be open to public inspection. Such exemption is subject to the opinion of the Texas Attorney General and the Open Records Act. County shall not be liable for releasing such material if advised to do so by the Texas Attorney General or by court order.

The vendor's proposal must include an installation plan which must incorporate all activities associated with software and or service implementation complete with cost details. The proposed installation plan must clearly identify the vendor's responsibilities and Harris County 's responsibilities, if any.

MOBILE COMPUTING REQUEST FOR PROPOSAL -PAGE - 2

All proposed plans are open to negotiation until a contract is executed at which point criteria for acceptance will be based on the implementation plans as identified and approved by Harris County.

Evaluation Process

All proposal will be examined by an evaluation committee.

Proposals which do not conform to the instructions given or which do not address all the questions and/or requirements as specified may be eliminated from consideration. Harris County, however, reserves the right to accept such a proposal if it is determined to be in the County's best interest to do so.

Harris County will initiate vendor presentations and or discussions with vendors. Proposal will be accepted during this period from vendors who responded to the original request. Presentations and or discussions may not be initiated by vendors. Harris County expects to conduct these sessions with vendor personnel authorized to make contract offers on the vendor's behalf.

Following vendor presentations, Harris County will schedule contract negotiations with the successful vendor as selected by the Precinct 4's evaluation personnel. If Harris County is unable to agree with the vendor on contract terms and/or pricing considerations, Harris County reserves the right to terminate contract negotiations with that vendor and select and initiate negotiations with another vendor without undertaking a new request for proposal process.

No award or acquisition can be made until Commissioners Court approves such action based on the evaluation committee recommendation and the vendor receives a signed contract together with a valid purchase order.

Submission of a proposal implies the vendor's acceptance of the evaluation criteria and vendor recognition that subjective judgments must be made by the evaluating committee.

Evaluation Criteria

Based on the vendor's proposal and the complete RFP process Harris County and the RFP committee reserves the right to contract with the vendor best meeting the RFP specifications and requirements and the needs and requirements of Harris County.

2.0 INTRODUCTION

The **HARRIS COUNTY PRECINCT 4 CONSTABLE'S OFFICE** seeks proposals for the purchase of application and system software, custom software development services, computer hardware and training on use of proposed software and hardware to:

provide the Department with the ability to query various state and local data bases via an 800 MHZ Radio Frequency Network;

to receive call for service information directly to a computer installed in a vehicle;

prepare offense reports, traffic citations, accident reports and other reports required by each law enforcement agency involved; and,

extract information from queries and calls for service received from host computers and embed into the data capture screens operating on the in-vehicle device.

It is the intent of this law enforcement agency to acquire a system that can be maintained and operated in the mobile or portable environment in which law enforcement operates, specifically that of the Precinct 4 Constable.

The planned mobile system must be able to interface with current and future law enforcement and Justice Information Management System (JIMS) applications utilized or planned by Harris County Law Enforcement.

The system proposed must not impede integration and/or communication with other law enforcement agencies that Harris County may in the future desire to communicate electronically. The proposal must provide a consistent growth path within the solution proposed, for expansion of the project to utilize new and emerging technologies.

Description of Business Problem

MOBILE COMPUTING REQUEST FOR PROPOSAL -PAGE - 3

Law Enforcement operates within a mobile environment. In this environment, required tasks are to receive, record and disseminate information in an effective and efficient manner.

These three tasks are critical to officer and public safety as well as effective crime solving and apprehension. The following are descriptions of the functions involved in the process that are to be addressed in this proposal.

DATA COLLECTION

Report Writing

The report writing process currently utilized by this agency to collect and store information contained in the report is centralized and thus requires redundant processing of reports and data collection by officers in the field. This process results in data processing bottlenecks, data entry errors raising data integrity issues concerning the data collected, incomplete data collection, and a considerable duplication of effort and resulting time loss available resources in the field.

The reporting system's platform is a mid-range mainframe (UNISYS 2200/422). The application and systems software is MAPPER Version 36RI. To add records to the files, reports are entered from a device at either a District Sub-station or a Central Records Section staffed by clerical personnel.

Due to logistics describe above, requiring a law enforcement officer to enter reports reduces the number of hours per day the officer spends on patrol or the requirement to provide overtime for the purpose. Neither alternative is acceptable.

In 1993, Harris County Law Enforcement prepared approximately 88,190 offense reports; 8,300 accident reports; and made 3,129 arrests while responding to Calls For Service or Traffic Stops which resulted in a report. In 1994 to date, there were 92,575 calls for service responded to that required an offense report to be prepared.

These reports are manually prepared, in the field, by the law enforcement officers that responded to and investigated the reported crime.

The reports are then entered by the initiating officer into the computerized Offense Reporting System (COLORS). The direct entry of this data by the initiating officer causes delays in responses for calls for service and impacts the overall field activity.

Traffic Citations

Traffic citations are prepared and issued in paper form by law enforcement personnel in a mobile environment. The citation is a pre-printed and pre-numbered form designed under the mandates of law. Additionally, the form and content of the citation is dictated by the Justice of the Peace of the area in which the violator committed the violation. The citation is currently prepared by the officer by hand-writing the required information on the pre-printed form. The information collected is based on the violation, information derived from the violator and from data bases maintained by the state(s) concerning the violator on licensed drivers and motor vehicle registration files.

A copy of the citation is delivered to the violator. A copy is retained by the officer. The officer is required to submit his/her copy of the citation to the appropriate district/precinct command offices. At each of the command stations, copies are made of citation, data from the citation is recorded in various software programs for statistical purposes and the original is sent, by transmittal, to the Justice of the Peace for initiation of the case in the Justice of Peace Case Management and Calendaring system.

Harris County Law Enforcement issued approximately 280,000 citations in 1993. This does not include STEP (Strategic Traffic Enforcement Program) programs which accounted for 15000 citations in FY 93 (October 92 - September 93)

Traffic Accidents

Accident reports are completed by a responding law enforcement officer at the accident site using a standard State Traffic Accident Form (ST-3). The form is copied and delivered to the state. It is maintained in multiple locations for statistical and administrative purposes. Contents of the form include information about the site, drivers, witnesses, environment and action taken. These reports also include a diagram of the scene.

Copies of these reports are submitted to the officer's command. The reports are available to the public and insurance companies who represent the drivers and or damaged parties in the accident. The reports often times are used as evidence in court trials.

RECEIVING DATA

Calls for Service (Dispatch)

Currently Harris County Law Enforcement agencies maintain Communication Center's manned by call takers and dispatcher's. These personnel receive calls for assistance from the public via telephone, record pertinent information about the service required and nature of the call. This information, referred to as a Call for Service (CFS), is then 'dispatched' to patrol units assigned within the area of the call. The CFS' are queued in UNASSIGNED and ASSIGNED Event files that all dispatchers monitor to ensure service is dispatched.

Each agency has designated beats or zones to which patrol units are assigned. These areas are identified within a geographical information system utilized by Communication staffs within each law enforcement agency. All locations within each area are identified by street block range/street name, intersections and common places and these locations are associated to the zone identifier. Resources (units) are then associated to these zones/beats. The resource is activated when the unit radios in to dispatcher and signs-on duty. The unit is de-activated when it radios in to the dispatcher to sign-off.

Calls for Service are 'assigned' to a 'signed-on' unit by a dispatcher. This information is recorded and time stamped. When the officer accepts the call and goes en route to the location. the officer radios in his/her arrival and the dispatcher records the time. Upon completion, the officer radios clearance and type of disposition. The dispatcher records this information and the officer becomes available for another call for service.

Information gathered at dispatch is based on information provided the Communications Department by the public and the officer. This information once recorded is maintained for statistical data about crime reporting and if cleared as a report or an arrest made, is transferred to the Computerized Online Offense Reporting System. An offense report is then prepared by the officer who responded to the call.

Data Base Access

Law Enforcement officers require current information about subjects being investigated, detained in the field or stopped for traffic violations. Information required is frequently maintained in national and state data bases. Pertinent information is also maintained in local and regional data bases.

Currently the officers' access to these data bases is either from his/her dispatcher, a telephone call to his/her command or coming into an office that has a terminal device associated to one or all of the data bases.

Data bases that are accessed with frequency are:

JUSTICE INFORMATION MANAGEMENT SYSTEM (HARRIS COUNTY)
TEXAS CRIME INFORMATION CENTER (DPS -AUSTIN)
NATIONAL CRIME INFORMATION CENTER (FBI - WASHINGTON DC)
SOUTHEAST TEXAS CRIME INFORMATION CENTER (HARRIS COUNTY)
TLETS NETWORK DATA BASES

This information is necessary and critical to the performance of the officer's duty as well the as safety of the officer and the person in custody.

Currently this information is available to the patrolman via dispatch. The number of requests for queries to the dispatcher from the officer in the field are numerous and result in backlogs. These backlogs result in response time back to the officer of as much as 30 to 45 minutes. Often times the officer will not request the search because of the delay in receiving a response. At times persons wanted for crimes are released. More often the citizen stopped on a routine traffic stop is detained on the side of the road in a hazardous situation because of the delay.

Unnecessary voice communication is currently required because the officers only method of communications is by voice through the dispatcher or directly to another unit.
Voice communications is inefficient and is not secure.

MOBILE COMPUTING REQUEST FOR PROPOSAL -PAGE - 5

CURRENT PROCESS DISADVANTAGES

Offense Report Writing

1) Requires redundant report preparation when filing charges and hampers court adjudication at preliminary and arraignment hearings. This results in unnecessary delay and multiple re-sets directly associated with the delay in report writing due to manual and redundant reporting required;

2) Creates 'funnel' affect in processing creating a growing backlog of reports to be processed.

3) Impedes statutory reporting requirements;

4) Makes crime analysis and compilation of demographic data regarding crime in the unincorporated area of the County difficult if not impossible;

5) Necessitates maintaining high number of clerical Personnel, or utilizing field units to enter reports directly , thus impacting availability of resources;

Traffic Citations

Problems associated with the high volume of this activity are:

1. Delays in transmitting citations to courts;
2. Poor reporting capabilities;
3. Insufficient collection capability; and,
4. Backlog of data entry, case initiation, and warrant issuance.
5. Creates delay in fine collection.

Accident Reports

Problems associated with this manual process are:

1. Poor reporting capabilities;
2. Mass storage problems;
3. Locating aged information; and,
4. Retrieving forms from remote storage
5. Delays in reporting.

STRATEGY FOR MODERNIZATION

A. **Implement a mechanism that will provide this agency with the ability to:**

1. Retrieve data as necessary without need of assistance from a third party;

2. Collect data in a format that can be utilized by other agencies within the criminal justice process without necessity of re-entry or intermediate processing to obtain a usable product;

3. Dissemination of data collected electronically to agencies or persons requiring data;

4. Effectively and efficiently insure quality of products to reduce number of rejected reports and delays due to incorrect or incomplete information

B. **Increase productivity by**:

1. Eliminating redundant preparation of offense reports;

2. Eliminating redundant preparation of traffic citations and case initiation entry in the Justice of the Peace Case Management System;

3. Eliminating backlog of offense report entry;
4. Reducing current costs in human resources required to process reports;

5. Reducing costs to victims of crime within Harris County by affecting efficiency of information collections and dissemination from the time a crime is reported until the investigation is started;

7. Creating process where offense reports are online within twenty-four hours (vehicle thefts immediately) after end of shift or sooner;

8. Creating process where offense reports are online within a twenty-four period.

9. Charges recorded with the District Attorney.

Anticipated Results

A. **Increase productivity** by increasing the percentage of calls responded to;

B. **Increase quality** of reports;

C. **Enhance training** capabilities;

D. **Decrease liability** to Harris County;

E. **Decrease time** from receipt of from CFS to initiation of investigation;

F. **Reduce processing** time for each response. Thereby increasing patrol time.

General - Requirements

The objective is to obtain a complete set of functions for an optimal Mobile Computing System. The selected contractor must be capable of accepting responsibility for the acquisition, delivery, testing and installation of all necessary equipment and for the development, installation, and training in the use of the computer system, along with all operational instructions, in order that the agency have a smooth installation.

The contract resulting from this procurement must be for a firm fixed price. Progress payments for hardware and software will be considered, provided such payments are based on completion of defined milestones in the project.

All hardware and software, must be in daily use in at least three (3) public safety agencies. References should be provided.

Vendors must have experience as Law Enforcement Integrator to public safety agencies and should have the experience in Mobile Data Computing and related communications, field data collection software, services, training and customized host interfaces.

The vendor selected may be required to act as the integrator and will have total responsibility to ensure the system and installation is a success. Vendors responding must list their subcontractors and define their roles respective to this RFP. It is the intent of this RFP that Harris County will contract with one primary vendor to assume all responsibilities set forth in this RFP.

Vendors must have a package (access to TLETS, UCR, IBR Statutes) that meets the requirements of the State of Texas and be able to demonstrate their compliance upon responding to this RFP. If this functionality does not exist and cannot be demonstrated to Harris County, the proposing vendors must include all costs for modifying their proposed solutions in their RFP response.

The following generally describes the components each responder must include in their proposal. The descriptions included herein are not meant to limit or discourage a more appropriate product or item. Harris County is seeking a workable proposal for a Mobile Computing System.

The components included in the proposal are:

Software
- Field Device
- Middleware (Office Network Software, File Transfer / SQL, etc.)
- Mainframe

Hardware/Equipment
- Laptop/Mobile Computer and Components

- Printer for Mobile Unit
- Radio Modem and Components
- Mobile Docking Station and Mount
- Command Center Docking/Receiving Station

I. Software Requirements

Vendor must propose site licenses for all software described herein:

1. The following software applications should be able to function on the same hardware platform proposed.

2. All pen-based software should be capable of using Microsoft Windows technology.

3. All software should have a consistent look and feel, be integrated through a Main Menu System and share data across the different applications specified herein.

4. All software must be able to update the appropriate host-based systems where applicable.

Citation Software

The Citation Screen should have a facility to access standard violations described in Texas Statues and Penal Code. Vendors must describe how the proposed citation application functions in complete detail. Vendors must describe interface to agency's host mainframe and how information can be accessed and captured for citation production at field level. Citation information must update other required applications seamlessly.

1. The user must be able to first enter a keyword for the violation required.

2. Detailed violations for that keyword must be displayed and the user able to select the specific violation to be charged.

3. The entire text of a violation must be able to be displayed, and a comment must be able to be entered. The individual to be cited must be able to be selected from a list of previously entered drivers, passengers, pedestrians, etc.; if previously cited.

4. There must be no need to enter name, address and driver's license information in the system more than once. Preferably information should be retrievable from TLETS and/or NLETS responses.

5. Screens should be designed to optimize ticket collection. The system design should be presented in a logical and intuitive nature for police officers. Vendors must describe how proposed software accomplishes this requirement.

6. Users must be able to navigate between screens during use without returning to the Main Menu Screen. Vendors must describe how this is performed.

7. Software should have drop down choice lists in order that the officer will not have to manually write out such things as; offense, street address, etc.

8. Software must be designed so that the user will never have to write out the same information twice.

9. User should have access to such functions as; navigational arrows, scrolling list window, write boxes and a pop up keyboard in order to facilitate data collection.

10. Software must have pop-up scrolling windows and help screens that are tailored to the agency's specific needs.

11. Ticket and citation field software must keep a list of stolen vehicles received from the host record system. Vendor must describe interface(s) to the Unisys 2200/IBM 3090/AS 400 Network and how vendor proposes to get data into the correct format. A description of how the Stolen List is to be maintained on the Mobile Device is required.

12. When a tag number or VIN is entered the number should automatically check against the stolen list. Vendor must describe how this function works and any functions enhancing officer safety.

13. Software should have password/login identification capability by field unit. Password/login I.D. capability must be by officer to allow multiple officers to use the field unit.

14. Printing of ticket and moving citations must be done using the agency's defined forms.

15. Vendor must describe how citations are tracked on the field device.

16. Vendor must describe proposed software's ticket auditing functions.

17. Vendor must describe how invalid tickets are kept from being generated using vendor's proposed software.

18. Mandatory or required fields should not allow user to bypass unless filled in. Likewise, standard edits should exist on variable fields.

19. Vendors must describe option to add magnetic strip reader and bar code reader and how it will work with proposed software.

20. Software must have Help function available. Vendors must describe how the Help function works.

21. Vendors must describe all information captured, tracked and available from the citation software system.

22. Mobile Computing Device should come configured to store at a minimum of 200-300 citations. Vendors should specify how much disk Citation Application requires.

23. Certain reports collected in the field must be able to be transferred to the host side via RF, direct connect, or dial-in modem. The hosted field unit must be able to print the resulting incident reports on a laser printer. Vendor must provide the required data transferred program and print software.

24. Vendors must describe how all final data is collected and reported upon and interfaced to agency's mainframe.

Traffic Accident Reporting Software

Vendors must describe in complete detail as possible the functions of the proposed Traffic Accident Reporting Software. Proposed software must share information with other software modules required herein.

1. Traffic Accident Reporting System must use screens that are specially designed to optimize accident data collection.

2. All of the elements contained in the appropriate forms must be presented in a logical and intuitive manner.

3. Software must guide users through the data collection process. Vendors must describe how software accomplishes this function.

4. The software must provide a Main Menu. The Main Menu must allow for quick and easy navigation to each individual screen in the system.

5. Users must be able to quickly return to the Main Menu Screen from other screens in the system.

6. Users must be able to navigate between screens during use without returning to the Main Menu Screen. Vendors must describe how this is performed.

7. Software must use navigational arrows, scrolling list windows, write in boxes, and pop up keyboards are used to make the data collection work move quickly and accurately.

8. On-line help must always be available. Vendors must describe how the Help function is invoked and how the Help function works.

9. On-line help must be user friendly and provide the same or better level of assistance of traditional manuals.

10. The system must provide a crash/accident list. The crash/accident list user must display all previously entered reports.

11. The operator must be able to select a prior crash for update, or to start a new report.

12. Software must be able to sort data. Vendors must describe data fields available to be sorted.

13. The screen must be able to display all crashes, crashes not completed or only completed crashes.

14. System must have columns for items that occur once per accident, are identified with a particular vehicle, or other items such as pedestrians or property damage.

15. Screen input must be segmented into the following logical areas:

15.1 Time and Location:
A time and location screen used to capture information about the crash such as the date and time of the crash, arrival time and the exact location of the crash.

15.2 Environment Screen:
The environment screen must describe harmful events and environmental conditions at the time of the crash.

15.3 Injuries:
The Injuries screen must identify those who administered first aid and how the injured were transported.

15.4 Vehicle:
The system must create a vehicle information screen for each vehicle involved in the accident. Type, color, make, VIN number, insurance company, policy number, license number and vehicle owner information must be available on this screen. This information is preferred to be retrievable from Motor Vehicle Division (MVD) data base response.

15.5 Driver:
Driver information must be able to be entered for each vehicle involved in the accident.

15.5.1 Personal Information must be able to be entered. Vendor must describe this function.

15.5.2 Information on injuries and drug or alcohol use must be able to be entered on this screen; to include alcohol or substance impairment testing results.

15.6 Passengers:
Passengers must be able to add to a vehicle record, and information on their address, location in vehicle, severity of injuries and use of safety equipment must be entered and available.

15.7 Vehicle Damage:
An exact copy of the state vehicle diagram must be able to be displayed. Areas of damage and initial point of impact must be able to be recorded using check boxes and "radio buttons". Estimated damage amounts and vehicle removal information must be able to be entered.

15.8 Vehicle Description:
Direction of travel, vehicle movement, contributing causes, and vehicle defect must be able to be entered using pop-up windows.

15.9 Trailers:
Trailer information must be able to be entered and tied into individual vehicles on one screen. Access to vehicle description and vehicle information screen must be able to be made directly from this screen.

15.10 Pedestrians:
A pedestrian's name, address, actions and contributing causes must be able to be entered on this screen.

15.11 Property Damage:
A description of the damage must be able to be entered and collected. Estimated damage amounts and the owner of the damaged property must be able to be recorded.

15.12 Witnesses:
Name, address and phone number of witnesses must be able to be entered on this screen.

15.13 Accident Narrative Screens:
The Accident Narrative Screen must be able to be used to enter narrative information about an accident and the specific activities surrounding the accident.

15.14 Data Transfer:
Reports collected in the field must be transferable to host side via RF, direct connect, or dial-in modem. The host then would be able to print the resulting incident reports on a laser printer. Vendor must provide the required data transferred program and print software.

Accident Diagraming Functions

Accident Diagramming capabilities should include the following:

1. Ability to generate drawings of intersections from the following numerically defined type of data:
   - 1.1 number of left turn, left/straight, straight, right/straight, right turn and opposing lanes.
   - 1.2 number of intersecting roads
   - 1.3 median width; corner radius
   - 1.4 crosswalk setback, width and distance to stop
2. Ability to select common types of intersections.
3. Define/retrieve named intersections.
4. Full zoom/pan capability.
5. All common objects (car, trucks, pedestrians, etc.) pre-defined.
6. Allow free-hand drawing of any object, which can be repositioned and rotated to any angle.
7. Text labels, both pre-defined and user-generated.
8. All objects and text may be sized, repositioned and rotated to any angle.

Incident/Offense Reporting Software

Software for the portable data collection computers is required, which allows for the collection of incident data as simply as possible. This software should use as many internal code tables as possible to allow for look-ups rather than handwritten entries. Necessary edits to variables on the screen should be included to prevent entry error. Cell data collected in the field will be transported to the existing Offense Reporting system.

1. The Incident/Offense Reporting System must use screens that are specially designed to optimize incident data collection.
2. All of the elements contained in the appropriate forms must be presented in a logical and intuitive manner.
3. The user must be supported and guided through the data collection process by the software.
4. Multiple means of data entry must be provided to assist the user.
5. Navigational arrows, scrolling list windows, write-in boxes, and pop-up keyboards used to make the data collection work move quickly and accurately.
6. On-line Help must be always available. Vendors must describe how Help is implemented and how it functions.
7. Screen input must be segmented into the following logical areas:

   7.1 Main Menu:
   A Main Menu must allow for quick and easy navigation to each individual screen in the system.

   7.1.1 Users must be able to quickly return to the Main Menu Screen from other screens in the system.

7.1.2 Users must be able to navigate between screens during use without returning to the Main Menu Screen. Individual topic screens accessed by the Main Menu must include the Event Information, Narrative, Person, Property, Vehicles and Worthless Documents Screens.

7.2 Event Information:
An Event Information Screen must provide for easy entry of information about the time and location of an incident. User must be able to transfer the information contained in Calls for Service to Page 1 of report or enter directly.

7.2.1 Pop-up window, must allow for the selection of information, the system's clock must be able to be used to set times.

7.3 Persons Information:
A Persons Information Screens must allow the entry of information about individuals involved in the incident. These screens collect information common to all individuals involved.

7.3.1 The information collected about the individual must include his/her role or status as a participant in the incident. Status must include: Victim (civilian, business, or officer), Reporting Person, Proprietor, Witness, Suspect, Arrestee and Missing Person. Once status is selected, additional navigation buttons displayed to indicate the additional information screens that are required such as Physical Description, Victim, Juvenile, Court Information, Charges and Arrestee Information Screens.

7.4 Charges:
A Charges screen must be able to be used to access standard violations.

7.4.1 The system must allow the user to first enter a keyword for the violation required.

7.4.2 Detailed violations for that keyword then must be displayed, and the user selects the specific violation to be charged. Once selected, the entire text of the violation must be displayed, and comments then allowed to be entered.

7.5 Arrest Narrative:
Arrest Narrative Screens must be able to be used to enter narrative information about an arrestee and the specific activities surrounding the incident and a particular arrestee.

7.6 Incident Synopsis and Narrative:
An Incident Synopsis and Narrative Screen must be able to be used to enter narrative information about the entire incident as opposed to a particular arrestee.

7.7 Property Narrative:
A Property Screen must collect information about property and evidence involved in the incident. Information must include property description, ownership, estimated value and serial number of property.

7.8 Vehicles:
A Vehicles Screen must collect information describing the vehicles involved in the incident, their resultant condition, and towing information.

7.9 Worthless Document:
A Worthless Document Screen must collect information such as check number and bank name as well as crime scene information specific to the passing of a worthless document.

8. Data Transfer:
Reports collected in the field must be able to be transferred to the host side via RF, direct connect, or dial-in modem. The host then would be able to print the resulting incident reports on a laser printer. Vendor must provide the required data transferred program and print software.

9. Vendors must describe how all final data is collected and reported upon and interfaced to the agency's mainframe.

10. The host then will print the resulting incident reports on a laser printer. Vendor must provide the required data transferred program and print software. Vendor must describe how this will be accomplished.

MOBILE COMPUTING REQUEST FOR PROPOSAL -PAGE - 12

Incident Report Software

Vendors must describe in as much detail as possible the functions of the proposed Incident Reporting Software. Proposed software must share information with other software modules required herein.

Software Functional Characteristics:

1. The software must provide on-line access to State Statutes by keyword.

2. Once accessed, the system must have the ability to relate a statute to suspects, victims, arrestee without additional entry.

3. The system must provide NIBRS standard reporting and the ability to convert State Statutes to the correct NIBRS codes.

4. A main menu screen must be available for quick access to every other screen in the application.

5. The system must be able to manage large numbers of card, passengers, witnesses, victims, suspects, arrestees, etc. involved in a single accident or incident. The system must give easy and fast access to the desired item in a long list of items via keyword or alpha entry.

6. The system must be able to quickly and easily enter an alternative selection on the same screen when none of the items on a list are appropriate.

7. The system must have the ability for an officer to "sign off" on a report and freeze the information so that it can not be altered without the officer's knowledge.

8. The system should minimize data entry by using pop-up windows with list selection.

9. First name, street name, street direction, street suffix selection should be available from pop-up lists.

10. System should allow single touch access to keyboards when appropriate (no need to double-click).

11. System must reduce narratives through the strategic use of pop-up windows listing choices for fast, error free selection and later identification on the host database.

12. This must facilitate access to the database via ad hoc inquiry for crime and accident analysis.

13. System must automatically verify that all required fields are entered and dependent fields are correct.

14. System must provide help on every field, every screen and every application, with spell checking provided for narrative fields.

15. All pop-up lists and state statutes must be easily updated by the department without recompiling, and updated on individual computers without intervention by the end-user.

16. Vendors must describe how all final data is collected and reported upon and interfaced to agency's mainframe.

17. The host then will print resulting incident reports on a laser printer. Vendor must provide the required data transferred program and print software. Vendor must describe how this will be accomplished.

Software Standards:

The system's software designed for this agency's requirements must have the following design features:

1. Ergonomics and navigation must have a consistent "look and feel" and must have been designed within a written set of standards.

2. The vendor must develop the software with Software Engineering Standard Techniques.

3. The vendor must supply a Software Project Management Plan, which meets or exceeds IEEE 1058.1.

4. The vendor must develop and supply a Software Requirements Specification, which meets or exceeds ANSI/IEEE Standard

830. The software must be developed from this Specification.

5. The vendor must develop and execute a Software Test Plan, which meets or exceeds ANSI/IEEE 829. The supplied software must be tested against this plan. Test results must be reported according to the standard.

6. The vendor must develop a Software Quality Assurance Plan, which meets or exceeds IEEE 730.1. The software must meet all specified quality goals.

7. Because the vendor software may be used as a SQL client in the future, the software must be written in a development language that supports embedded SQL.

Requirements for Mobile Communication Software (MCS)

1. System must be fully Microsoft Windows compatible.

1.1 Application software must be a true Microsoft Windows Application and must run on any Pen-based computer that supports DOS and Windows 3.1 with pen extensions.

1.2 Must use standard Microsoft Windows interface keyboard commands.

2. System must support numerous communication protocols to allow interfacing with several different RF modem products and with Motorola protocol RDLAP specifically. Please describe modem products available.

2.1 System must have Smart Alerts

2.1.1 If MCS is running in the background, an audible indication must still be heard when a message arrives.

2.1.2 Level of computer processing time spent multi-tasking for the MCS must be configureable using the standard Microsoft Windows tasking option settings.

2.1.3 Two different audible alerts must be available to distinguish between regular messages and priority messages.

2.1.4 Must be customizable, digitally stored, audible alerts. For example, the alert can be a speech synthesized message stating, "You have a message"

3. Smart message management

3.1 Storage space must be available for hundreds of messages

3.2 Transmit stored buffer for recalling, editing, and rescinding any previously transmitted message must be available.

3.3 System must have ability to quickly delete multiple messages with a single key press or pen selection.

3.4 System must have ability to store partial completed forms that can be recalled later for additional data entry and then transmitted. This can also be used to store form templates.

3.5 System must have a message list capable of showing any combination of all received messages, stored messages, and stored forms

3.6 System must have a quick scrolling feature that allows all received messages to be scrolled through by simply pressing the enter key.

3.7 System must have an additional accelerator key definitions for quickly scrolling through all saved messages or all saved forms.

4.0 System must have a user friendly ergonomics resulting in greatly reduced training time

4.1 System must have a full navigation and usage from either a pen or a keyboard

4.2 System must have an option of editing and transmitting forms from either a command line or by entering data into user friendly fields.

4.3 System must have drop down choice lists for quick data entry

4.4 System must have choice lists that can be customized by the operator

4.5 System must have a menu screen showing all status and query buttons as well as function key definitions for each.

4.6 System must always have visible buttons for commonly used status, queries, or control.

Message Switching:

The Harris County Precinct 4 Constable's's Department, along with other Harris County Law Enforcement agencies, is currently running on a Unisys 2200/402 under the control of the OS1100 Operating System. The Unisys 2200/402 mainframe computer provides primary computer aided dispatch (CAD), records, towed vehicles, alarms, etc. systems. All systems are developed in a Unisys 4GL language called MAPPER. The CAD system provides primary control and logging of all calls for service and unit status activities as well as access to the records system for inquiry and update.

Communications

All mobile units must be able to access all data bases that exit on the NLETS and TLETS telecommunication networks. All mobile units must be able to communicate to the Unisys 2200 Computer Aided Dispatch system for such things as: dispatching of vehicles, update events on the CAD command screen and unit status. Vendor must describe how the proposed solutions will accomplish these functions.

The vendors responding to this RFP should describe in detail how they will provide the functionality outlined in this section, provide a detailed time line and costs for development if required.

The proposing vendors must provide a message switching capability providing two-way communications between the Mobile Computing Devices and the communications center as well as interactive communications with any other authorized user (host to host) attached to the 2200 system. The message switch must provide encoding and decoding of user headers and route the message to the proper destination whether it be another host, MDT controller or a 2200 program i.e., CAD, Records, etc. The Unisys 2200 has distributed communications processors attached to the host environment which can be utilized as part of the proposing vendors solution. Additional information on the 2200/402 and DCP configurations are available upon written request.

II. HARDWARE

Equipment Technical Specifications

Computer Equipment

The contractor must provide a complete computer-based field reporting system capable of meeting all of the requirements defined herein. The incident reporting software must be a Microsoft Windows Application.

1. The Mobile Data Computer (Mobile Computing Device), must be capable of meeting or exceeding the processing power of an Intel 486 based product compatible with Microsoft Windowsand capable of processing the functions identified in this RFP.

2. The Mobile Computing Device must have a keyboard attachment, and have a tethered, non-battery powered, pen pointing device.

2.1 Include DOS 6.2 and Micro-software windows 3.1 with pen extensions or later versions

3. The Mobile Computing Device must be capable of utilizing pen based software for Pen-based applications. The pen must not be required to have a battery.

4. System must be multi-functional in design and able to run all, but not limited to the following applications:

- Citation Reporting
- Incident Reporting
- Traffic Accident Reporting
- Drinking While Intoxicated (DWI) Reporting
- MDT Emulation
- Productivity Reporting
- Miscellaneous Department Applications (Primarily DOS)

5. Mobile Computing Device must come configured with at least 240MB of HDD and 8MB Memory.

6. System must be configured for PenComputing.

7. The display for the Mobile Computing Device must be transflective and at least 9" diagonal screen.

8. The system must be ruggedized and appropriate for mobile law enforcement environment.

9. System must recognize both upper and lower case handwriting along with certain specified symbols, utilizing handwriting recognition software with an acceptable level of recognition.

10. Mobile Computing Device must come standard with reference guides and have low battery warnings and removable rechargeable battery packs.

11. Mobile Computing Device must not, due to it's size or weight restrict it's use in a portable environment. Size and weight and overall portability will be an important issue in the selection process.

12. Vendors must specify all environmental specifications and operating environments.

13. Mobile Computing Device's battery capacity must be a minimum or 4 to 6 hours during normal use.

14. Mobile Computing Device should have a "sleep" mode that is user defined that conserve battery life.

15. Vendors should specify any and all warranty information as part of the maintenance contract.

16. Mobile Computing Device hardware should have an AC Adapter, Power Cord, NiMH Battery Pack X2, Stylus Pen, System Diskette, and Softcase, and detachable external keyboard.

17. Be capable of generating graphics, and have a 1:1 aspect ratio

18. Vendors must propose a magnetic stripe reader to read driver's license data.

19. Vendors must specify all environmental tolerances.

20. The Mobile Computing Device vehicle mounting units must be proposed with pricing for installation. These units must not interfere with capability of dual air bags in patrol cars.

III. Printer Requirements

1. The printer must be an impact dot matrix device, and at least a speed of 150 CPS draft 37 CPS non-letter quality or better.

2. Printer must be able to print Harris County Citations.

3. Printer must be able to print multiple copies, four part forms or better.

4. Printer must fit inside of vehicle and not interfere with Dual Air Bags.

5. Printer must have minimal affect on space inside the vehicle.

6. Vendor must state all environmental operating requirements, input voltage, power consumption, shock and vibrations specifications.

Equipment and Software Installation

1. The contractor must arrange for the completion of all computer diagnostic tests suggested or required by the manufacturer to certify that the computers and system peripherals are fully operational.

2. The contractor must perform whatever system generation or configuration that is required.

3. Contractor may be responsible for Mobile Computing Device installation in the vehicles. Pricing for installation must be included in the proposal. Installation of mounting and Mobile Computing Device must not interfere with dual air bags.

4. All software must be fully operational and functional prior to acceptance.

5. Acceptance test required is for a period no less than 30 days from last change and no more than 45 days overall.

IV. MOBILE COMPUTING DEVICE POWER SUPPLY

Power Supply to the Device;

1. Vehicle Power Supply while affixed to the vehicle's radio modem.

2. Removal rechargeable battery packs.

3. Two rechargeable NiMH Battery Pack, with minimum of 3 hours battery life each.

4. Proposal should include multiple battery charging devices to located at each of the Stations.

V. RADIO FREQUENCY AND RADIO INTERFACE

1. The mobile computing device must interface with trunked 800 MHZ radio frequency. Proposal should include pricing and description of necessary components of the interface including the mobile radio modem and software if necessary.

2. The connection of the mobile computing device and the radio modem must be capable of handling 10,000 to 15,000 insertions per year for a minimum of three(3) years. Cost of replacement of said connectors will be an important issue in the selection process.

3. Transfer and access speeds from the MRM and the mobile computing device must be defined in the proposal.

Training Services

1. The contractor must provide sufficient training to familiarize Department employees with the computer system operation. Training will include:

    1.1 System Manager - Full training in the operation of the portable data collection computers.

    1.2 Executive Overview - Two hours of orientation to managers covering fundamentals of system operation.

    1.3 User Training - One eight-hour session to be conducted on-site with the end-users of the portable data collection computers.

2. Contractor is required to be on-site for acceptance testing for:

    2.1 Consulting

    2.2 System Enhancements/Modifications

    2.3 Perform Ride-Along to insure operational procedures are followed

MOBILE COMPUTING REQUEST FOR PROPOSAL -PAGE - 17

Warranty

The proposing contractor must provide a three year warranty on the system hardware (mobile data computer) and an open ended warranty on the application software. In addition, the contractor should manage the warranty with the hardware manufacturers when providing the hardware maintenance to Harris County.

Prime Contractor

The contractor selected may be required to act as a prime contractor and integrator and will have total responsibility for the project. The contractor shall assign an overall project manager who will be responsible for managing all project deliverables and resources. Harris County will also assign a project manager. The contractor's project manager will provide ongoing project reports to the Harris County project manager through the life of the project.

A project implementation plan with specific milestones should be provided as part of the contractor's response to the RFP. Resumes for the project manager and implementation team should also be provided in the contractor's response.

Equipment Maintenance

1. The contractor must provide warranty maintenance for a period of one-year for all equipment provided under the contract.

2. The vendor must provide an account manager, located in Houston, who will make regular contacts to resolve problems and insure that the system is operating at contracted levels, and to insure that Harris County Law Enforcement is aware of all updates or developments, new products, and options. Vendors must specify Account Manager, Project Manager, Field Service Technicians, Software Technicians associated with this RFP.

3. Proposals must include reporting procedures for problems or failures, including phone numbers, procedures and contact personnel.

4. Vendor must include problem escalation and complaint procedures with the names, titles, phone numbers, and addresses for responsible departments, their supervisors, and the superiors of those supervisors.

   Describe the hardware and software maintenance support available, including:

   1) Defined, guaranteed service call response time.

   2) Address the primary maintenance service location closest to the Public Safety Communications Advisory Board member agency.

   3) Average response time for service representatives to arrive at customer locations and average time to correct the problem.

   4) The number of service representatives employed at above location.

   5) The depth of service representatives experience possessed by the above engineers.

The Proposing Vendors must provide an On-site Maintenance Plan. If a Depot Maintenance Philosophy is proposed, the following components must be addressed:

1. Off-the-Shelf Replacement Units - Options, quantities and pricing for Vendor Supplied Units and Purchase of Spares by Harris County.

2. Coordinate repairs with all vendors who are providing equipment during the Equipment Warranty periods.

3. Manage the Depot Inventory in a secure environment preferably on-site.

4. Three Reference Sites, prefer local references but not required, where proposed methodology is being used.

5. The Mobile Computing Device off-the-shelf units should be pre-configured with all the required software to provide ready for use units for the patrolmen once units are replaced. These devices must be maintained at each member agency's location.

All vendor proposed maintenance personnel must be identified and pass Harris County Precinct 4 Constable's Department Security Clearance.

MOBILE COMPUTING REQUEST FOR PROPOSAL -PAGE - 19

Software Maintenance

1. The contractor will provide maintenance of system and applications software and associated documentation for a period of one year.

2. The starting date for this service will be the installation date for system software and the acceptance date for application software.

3. Software maintenance will include the correction of any programming deficiencies which cause the system to deviate from the specifications contained in the system design as approved.

4. The vendor should provide an account manager who will make regular contacts to resolve problems and ensure that the system is operating at expected levels, and to ensure that the Department liaison is aware of any updates or developments.

Experience of Vendor

Vendors must give at least three references where proposed solution is actually up and running. Vendors must include Field Collection Software, Mobile Data Computer Communication (MDT Evaluation) and at least one site communicating to a configuration similar to Harris County.

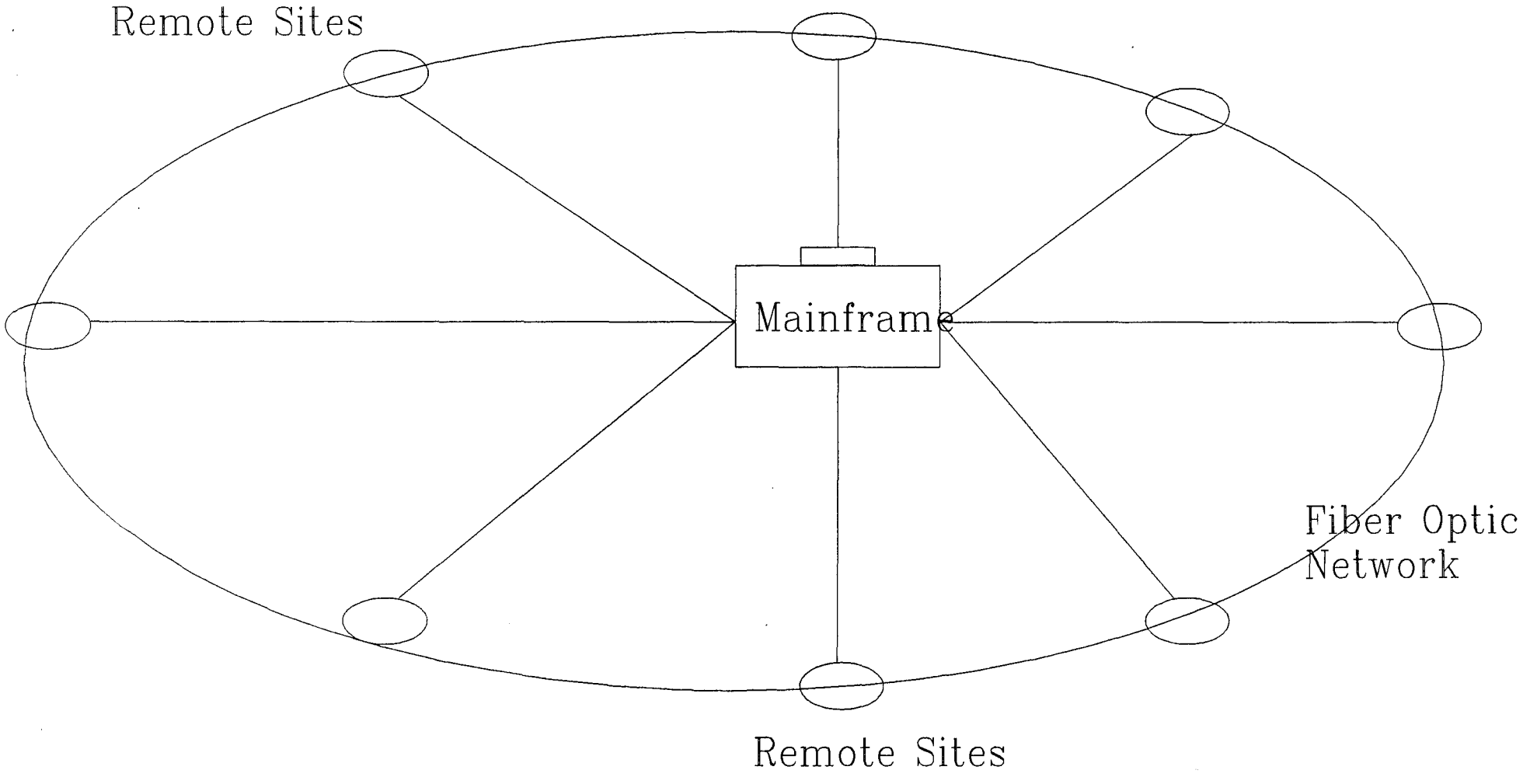
Demonstration

All vendors must be prepared to demonstrate their solution. Description of the actual demonstration requirements will be available at a later date if the Harris County Precinct 4 Constable or the Harris County Purchasing Agent deems it necessary at a time prior to award.

Acceptance

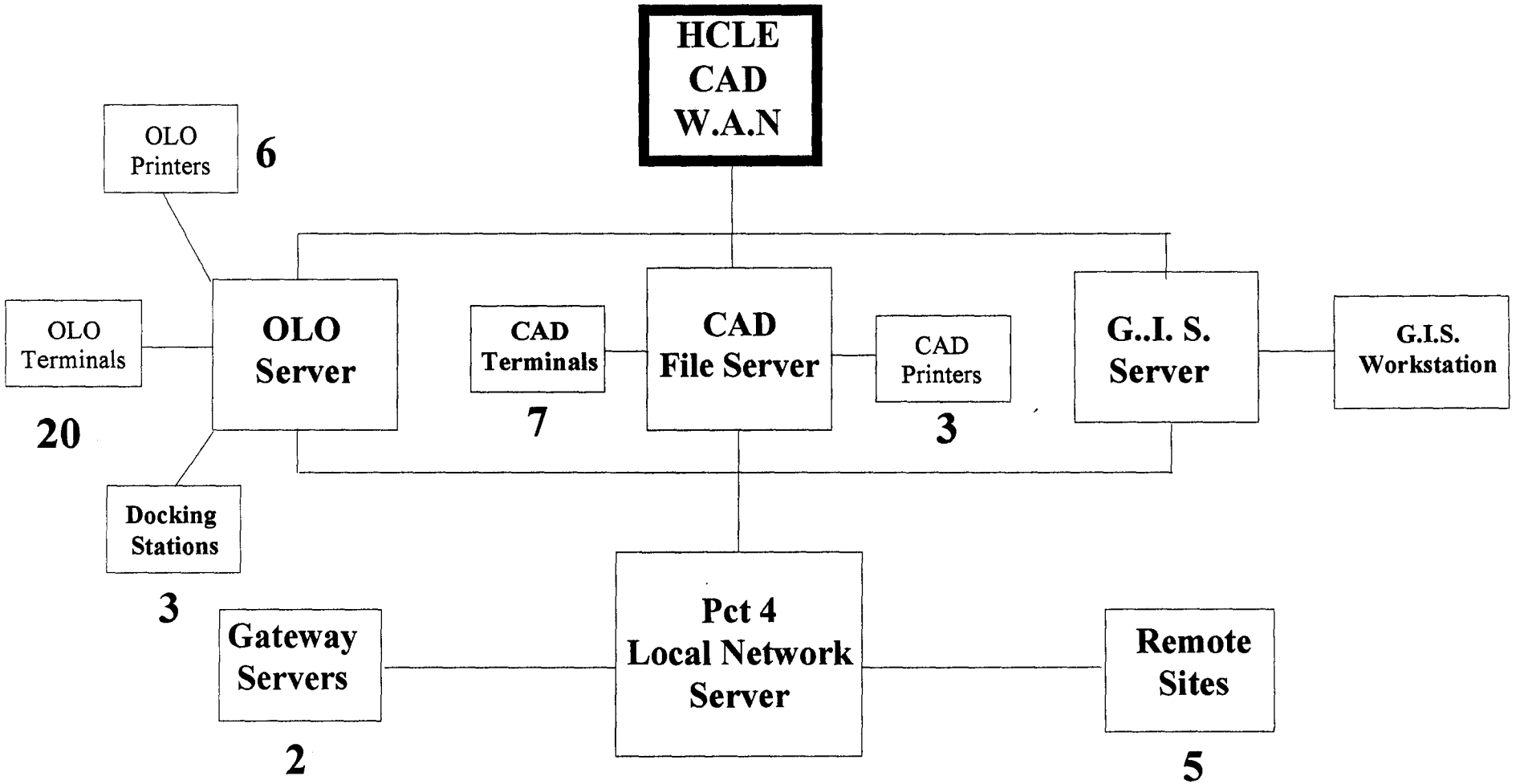
The contractors will provide a test period of thirty (30) days following installation of the mobile data computers and the last associated application software change. Harris County Precinct 4 will evaluate the applications during this 30 day period to insure that the Mobile Computing Devices function to the contractor's specifications as defined in their RFP response and that the software works to specifications. Upon successful completion of the test period, the County shall accept the equipment and software and pay for all delivered products and services in accordance with the contract signed.

Network Configuration



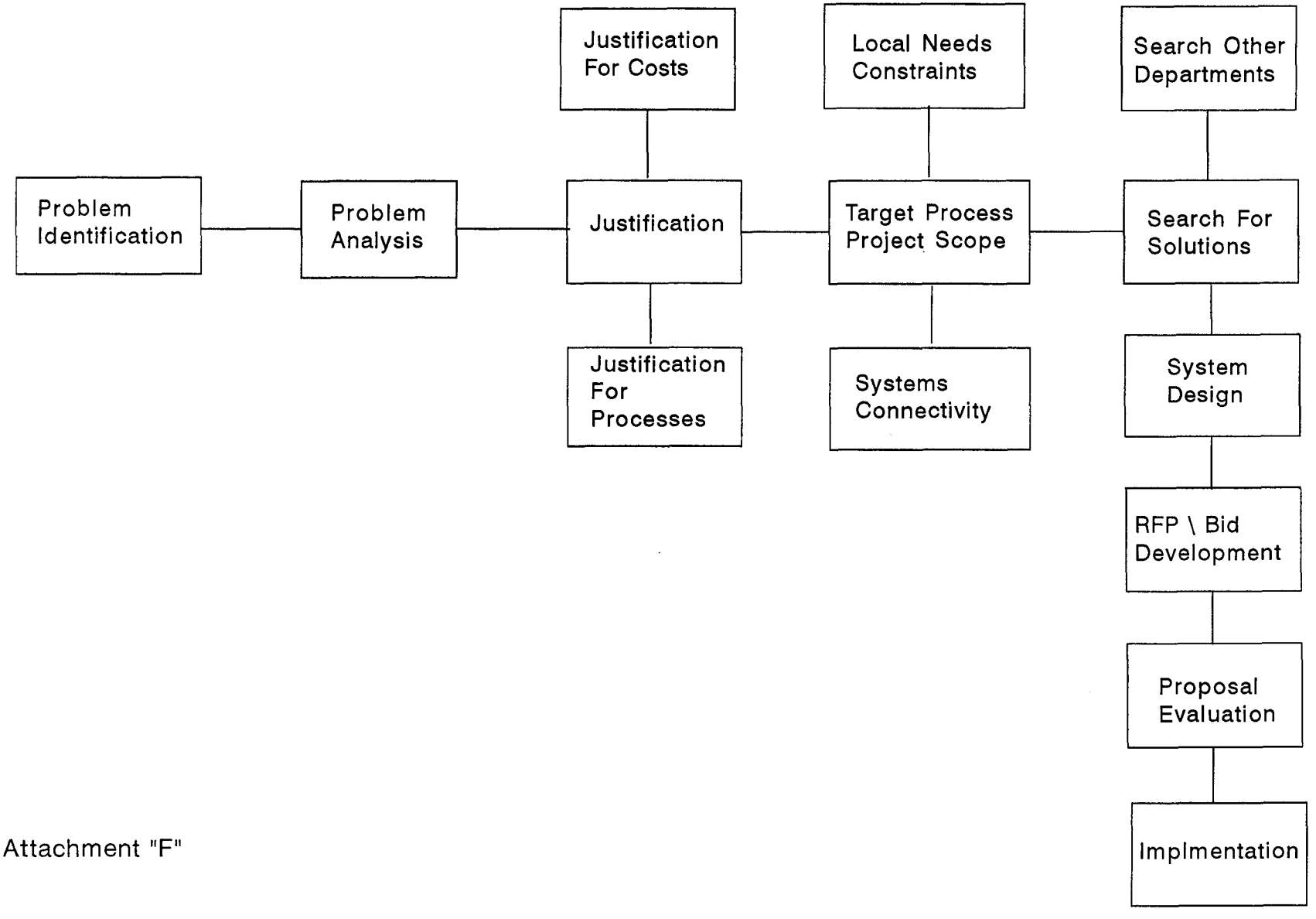
Attachment D

Constable Precinct 4
C.A.D. / OLO
Network Configuration



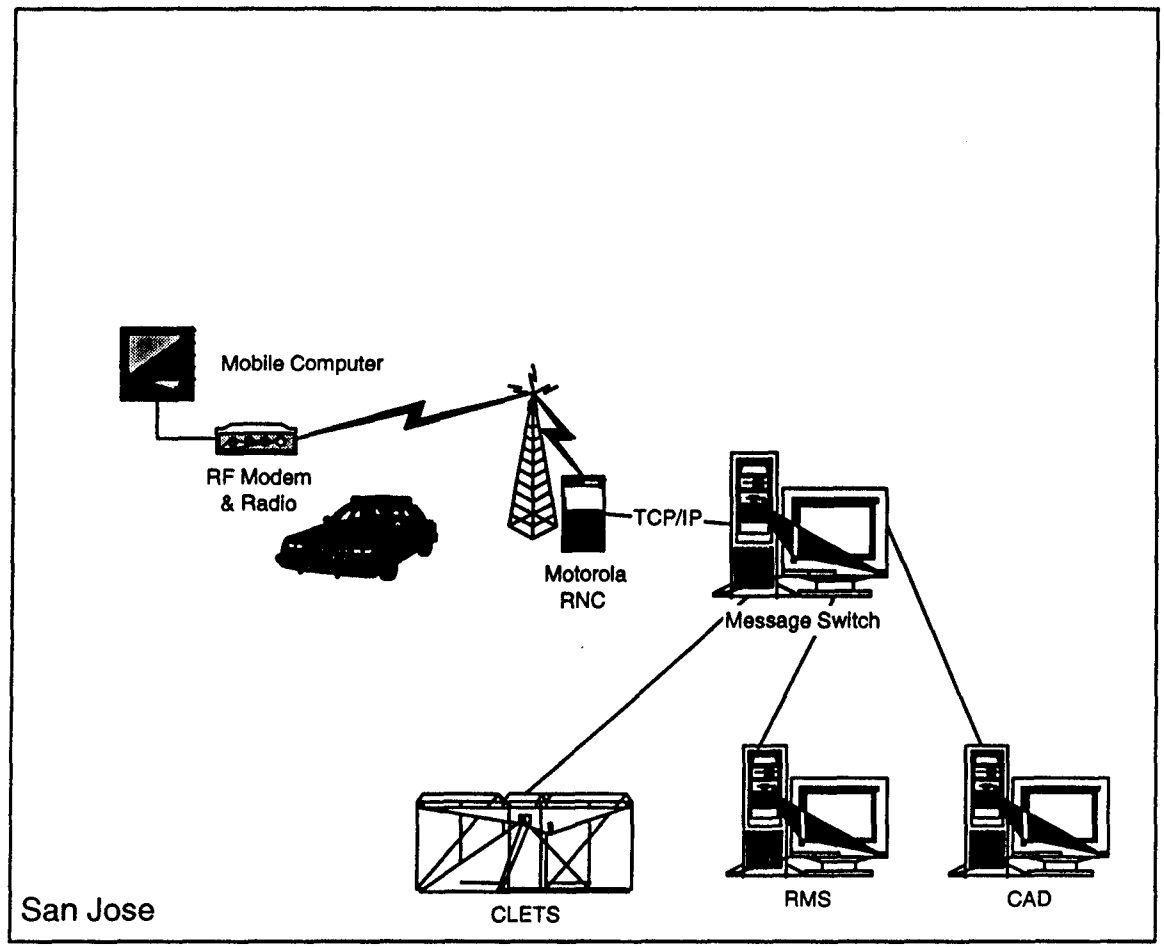
Attachment E

Mobile Computing Project Process Flow



Attachment "F"

MDC Radio Network



UNISYS

Attachment "G"