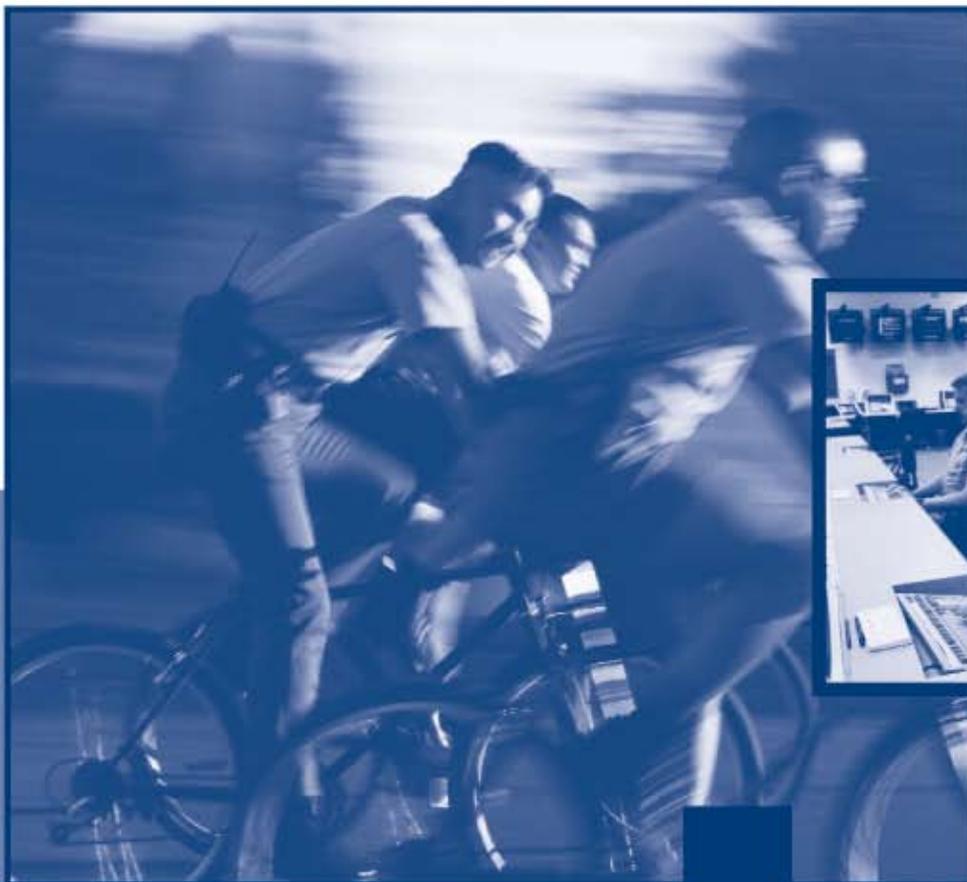# COPS Publication

Community Oriented Policing Services

www.usdoj.gov/cops/

Police Department

Information Systems Technology Enhancement Project

ISTEP

Police Department

| Information Systems Technology Enhancement Project |

ISTEP

Authors:

Terence Dunworth, Gary Cordner, Jack Greene, Timothy Bynum, Scott Decker, Thomas Rich, Shawn Ward, Vince Webb

Acknowledgments

Foreword

Since the inception of the COPS Office in 1994, this agency has provided upwards of one billion dollars in grants to state and local police agencies for information technology development and enhancement. The primary vehicle for this funding has been the COPS MORE (Making Officer Redeployment Effective) grant program which has had a tremendous impact at the community level. By providing agencies with the tools needed to effectively perform their jobs, the COPS MORE grant program is meeting the increasing demands placed on law enforcement as we enter the next century. The range of technology products funded cover a broad spectrum, from uniquely configured network enhancements at larger departments to simple off-the-shelf hardware and software products in some of the nation's smaller agencies. However, the underlying goal of this effort has been a universal one–to advance the practice of community policing by creating a more effective police force and improving the flow of information among police, local government service providers, and the citizens they serve.

In 1997, COPS launched the Information Systems Technology Enhancement Project (ISTEP), conducted by Abt Associates, Inc. The purpose of this project was to identify the basic principles of community policing as well as the added demands placed on departments transitioning to community policing. That information was then used to examine five police agencies that were successful in implementing and integrating the new technology. Each of those five case studies that follow contain valuable insights about the experience of law enforcement agencies involved: what worked, what didn't, and how to make the move toward updated technology a successful part of community policing.

It is our hope that this product will prove to be a valuable asset, as law enforcement agencies nationwide continue to expand their technological capacities and look to maximize the application of technology to community policing. As the former Commissioner of the Baltimore City Police Department, I was able to oversee the transition to a more technologically advanced police force and witness the tremendous benefits. Based on my experience, I would encourage all police managers to take advantage of the lessons learned at each of these departments studied and look to apply these lessons in your own internal strategic planning.

Tom Frazier, Director
Office of Community Oriented Policing Services

Contents

Chapter **1**

Police Department

| Information Systems Technology Enhancement Project |

ISTEP

ISTEP Conceptual Framework

Contents

ISTEP Conceptual Framework

The Information Systems Technology Enhancement Project (ISTEP), funded by the Office of Community Oriented Policing Services, focuses on enhancing the use of information in the context of community policing. Enhancements are implemented through two related but separate initiatives: (1) improvements in police information systems technology (e.g., hardware, software, connectivity) and (2) improvements in police data analysis methods (e.g., crime analysis, operations analysis).

1   Overview

Community-oriented policing (COP) is a modified approach to policing that redefines, extends, and expands the law enforcement approaches that have predominated for many decades. COP is best viewed as an addition to traditional or professional-era law enforcement, rather than a replacement of it. Professional-era law enforcement refers to a departmental emphasis on efficiency and narrowly defined responses to crime and disorder. Strategic and tactical decisions, under professional-era policing, are based on limited analysis of standard internal information such as calls-for-service and crime reports. As such, COP imposes new information needs on law enforcement.

What are these new information requirements associated with COP? Based on several factors discussed in this report, we have identified seven key information domains that must be addressed for successful COP implementation:

- Community interface
- Inter-organizational linkages
- Work-group facilitation
- Environmental scanning
- Problem orientation
- Area accountability
- Strategic management

1.1   Community Interface

Community policing emphasizes that the police should work closely with the community in addressing crime and disorder issues, that genuine partnerships should be created, and that individual citizens and community groups should play a larger role in maintaining public safety. Achieving these goals requires that the police engage in much more information sharing with community groups (both providing information to the community and obtaining information from the community).

1.2   Inter-Organizational Linkages

In community-oriented policing, the police strive to work closely with other government agencies (e.g., code enforcement, public works), nonprofit organizations, and the private sector to address crime and disorder issues more effectively. This requires access by law enforcement to information systems maintained by other agencies and organizations (e.g., databases on property ownership), and the provi-

sion of information by law enforcement to such agencies (e.g., drug-related calls and arrests at rental properties).

1.3   Work-Group Facilitation

COP imposes new or different information needs on officers and supervisors because of a new focus on joint action and shared responsibility for geographic areas and problems. This focus reflects the trend toward deemphasizing temporal and functional distinctions between work groups. For example, several officers and detectives working jointly on a problem-solving effort need the capacity to share information and coordinate their activities, even though they may be assigned to different units. Similarly, several officers jointly responsible for the condition of a beat need such a capacity, even though they work different shifts. Equally important, supervisors need information with which to direct, control, and coordinate work-group members who may not have the same work hours as the supervisor.

1.4   Environmental Scanning

Under COP, police departments have learned that they need to scan the environment more broadly than was traditionally the case. This need includes scanning to identify problems (the first step in the problem-solving process), as well as scanning for environmental data such as community characteristics, business cycles, land use, drug markets, and crime patterns. To do effective community policing, both police officers and police executives need substantial information about a wide range of existing and emerging issues and problems in the community.

1.5   Problem Orientation

Traditional information systems and analytical approaches in policing have tended to be incident oriented. These systems and approaches are not adequate for a successful COP approach, and they must be expanded. Information and analysis must be reoriented so that they support officers and detectives in identifying and analyzing problems related to their new responsibilities, as well as in assessing the effectiveness of responses once implemented. In a traditional policing context, there is often little opportunity for an officer to learn how chronic problems have been handled in the past, except by reviewing individual cases. Historically, there has been little or no systematic effort to develop and share institutional knowledge across officers about what works in solving problems. In community policing, however, this type of information is crucial for effective problem solving.

1.6   Area Accountability

COP emphasizes decentralized management of well-defined geographic areas. Such management entails flattening the police management hierarchy and decentralizing control and responsibility for particular geographic areas. Consequently, COP requires that area command have a different and more sophisticated level of information about available resources and their potential deployment than used to be the case. This information must permit an understanding of the range and kinds of problems that must be addressed; the knowledge, skills, and abilities of the workforce itself; the effectiveness of different kinds of interventions; and how to make resource

allocation decisions that bring these elements together in the most effective way. This management structure emphasizes the need to achieve results in a particular geographic area and refocuses accountability on area command. That can be intimidating for some commanders, and it is imperative that the information provided to them be adequate to their needs.

1.7   Strategic Management

The new information domain associated with strategic management is probably the most difficult to deal with satisfactorily. Though there is general acceptance that COP imposes more extensive demands on police executives, making their roles and responsibilities more complex, the magnitude and character of these new demands have not yet been systematically identified.

We can assert with confidence, however, that at least three factors are critical for a police chief dealing with strategic management issues: the needs and expectations of communities, links with other government as well as nongovernmental agencies, and area accountability. The nature of the police chief's role is changing; today's executives must develop the ability to use information about and from these sources in handling service demand and service delivery issues. Under the professional model, for example, police executives virtually had a formula, based largely on analysis of past calls-for-service data, for measuring environmental demand for police services and calculating resource needs. Under COP, however, this approach is no longer adequate. The resource demands of COP are generally believed to be different (and higher) than those of the professional policing model. But there is no established method for calculating this demand in a systematic way. In addition, acknowledging the new demand does not dispense with the need to respond effectively to calls for service. That is, COP is not a replacement for traditional reactive policing; rather, it is an extension of it that expands the definition of policing to meet today's needs.

2   Framework

The following sections of this document address several contextual questions pertinent to the ISTEP project in order to demonstrate the salience of the seven new information domains identified above. These questions include:

- What are the changes in police work and police administration associated with community policing that create new and/or different demands for information?

- Who are the new and/or different users and consumers of information associated with COP?

- As a consequence of these changes and the new or different users of information, what is the impact of COP on the types of data analysis that police agencies ought to perform?

- What are the implications of these changes for the types of information systems that modern police agencies need?

Discussing these issues in this order allows us to work back from (1) what the information is needed for and (2) who needs it, to (3) the new types of analysis that must be performed and (4) the new information systems required so that they can be performed.

3 Community Policing

Although community policing continues to defy simple definition, a host of characteristics are widely recognized. Six of these characteristics seem to be particularly important and to create different demands for information:

- Citizen input
- Geographic focus
- Prevention emphasis
- Partnerships
- Problem solving
- Management

3.1 Citizen Input

One characteristic of COP is a sincere and systematic effort to obtain and use citizen input when establishing police priorities, policies, and programs. Methods for obtaining citizen input can be informal or formal; in larger agencies, especially, they can include community meetings, community surveys, customer re-contacts, advisory boards, and Web home page feedback forms.

Obviously, citizen input is a unique, stand-alone type of information. Police agencies that take COP seriously have to devise not only ways of obtaining citizen input but also appropriate methods for analyzing and interpreting such information. This has not necessarily been a high priority for police departments operating under the traditional model.

The citizen input element of community policing leads directly to the increased importance of two information domains for modern policing – community interface and environmental scanning.

3.2 Geographic Focus

Another characteristic of COP is a refocusing of police attention and responsibility toward appropriate geographic units, such as neighborhoods, communities, and beats. The principal basis of police accountability is shifted away from time (e.g., the patrol shift) and function (e.g., burglary investigation) toward geography.

This aspect of COP creates a need for better geographically based information—hence the interest in crime mapping and geographic information systems (GIS) generally. Officers and detectives with geographic assignments need timely and accurate information about their areas of responsibility. Similarly, managers need geographically based information to allocate resources wisely and to evaluate officers, programs, and strategies. Surprisingly, despite a long history of using such organization-

al constructs as beats and precincts, most police departments have not traditionally engaged in thorough or sophisticated collection or analysis of geographically based information.

COP's focus on geography helps account for the increased importance of two information domains: the focus leads directly to area accountability and indirectly to work-group facilitation, since teams are often assigned the responsibility for managing crime and disorder problems in defined geographic areas.

3.3 Prevention Emphasis

A third characteristic of COP is an emphasis on prevention. This emphasis reflects both a more proactive approach to policing and a higher priority for preventing crime and disorder from occurring in the first place, in contrast to a reactive emphasis on after-the-fact enforcement and investigation. Popular prevention approaches include crime prevention through environmental design (CPTED) and situational crime prevention, as well as primary prevention efforts, which focus especially on youth.

A strong emphasis on prevention raises several information requirements, including:

- More attention to evaluation, to identify successful and unsuccessful prevention strategies (and to rule out displacement or general societal trends when beneficial effects seem to have been achieved).

- More sophisticated crime-specific data collection and analysis, to illuminate crime problems and search for solutions.

- More reliance on information from external sources (research institutes, police associations, etc.) about promising new prevention programs and strategies.

The three new police information domains most closely associated with COP's emphasis on prevention are environmental scanning, problem solving orientation, and strategic management. Effective prevention requires information about community conditions, emerging problems, and effective preventive responses.

3.4 Partnerships

One of the central elements of COP is partnerships. Police officers and police departments endeavor to work more collaboratively with individual citizens, community groups, other government agencies, nonprofit organizations, and the private sector. These entities are encouraged to take more responsibility for the control of crime and disorder, recognizing that the police alone have limited authority and resources.

The partnerships element introduces three separate information-related demands:

- Police agencies need information about the other entities with which they might partner, such as membership, leadership, purposes, authority, and resources.

- These other entities, in order to shoulder their new responsibilities effectively, need information about crime and disorder.

- Both parties (the police and their partners) need information about what the other is doing, in order to collaborate effectively.

The partnerships element of COP can also lead to new information sharing, such as when police departments gain easier access to information available to parole and probation agencies or to code enforcement and licensing agencies.

The emphasis on partnerships in community policing gives heightened importance to two information domains: community interface and inter-organizational linkages.

3.5 Problem Solving

The process of problem solving, a key operational element of COP, includes four information-dependent steps: scanning, analysis, the search for responses, and assessment. Police officers, and others with whom they collaborate in problem solving, need both traditional (e.g., crime) and nontraditional (e.g., fear of crime) types of police information to identify the most significant problems in their areas of responsibility, to analyze those problems, to choose appropriate responses, and to evaluate the success of their responses.

The problem-solving element of community policing obviously corresponds to the increased importance given to problem orientation as a police information domain. This COP element also:

- Relies on community interface to assure that the community's problems that are being addressed.

- Relies on inter-organizational linkages in identifying, analyzing, and responding to problems.

- Relies on environmental scanning for early detection of emerging problems.

- Raises the importance of work-group facilitation, since problem solving is often a team-based activity.

- Often overlaps with area accountability, since most problems are geographically based.

3.6 Management

It is important to consider the managerial implications of community policing. These include:

- More managerial accountability for geographic areas.

- More attention to quality rather than quantity.

- More delegated authority (and concomitant responsibility) for mid-level managers.

- A more genuinely open and collaborative approach to the community.

- A more coaching and participative style toward subordinates.

Each of these changes in police management potentially raises new or different information requirements.

The managerial implications of COP increase the importance of three police information domains: work-group facilitation, area accountability, and strategic management. These domains correspond, roughly, to changes in the responsibilities of police supervisors, commanders, and top-level executives associated with a full-fledged commitment to community policing.

4 Users and Consumers of Information

Traditionally, three groups were seen as the users of the raw data provided by police information systems and the more focused information provided by police analysts: (1) police executives, (2) police supervisors/managers, and (3) police officers/detectives. In most police departments, officers and detectives made the primary use of raw operational data about suspects, vehicles, property, etc.; these data supported such decisions as how to handle calls and suspicious people, whether to arrest, whether to tow a car, and whether to seize property. Supervisors and managers used raw quantitative data in evaluating their subordinates and sometimes used crime analysis reports to direct the tactics and targets of their units. Police executives made the primary use of analysis products to make resource allocation and deployment decisions and to inform media and political officials about specific events and overall crime trends and conditions.

Community policing promotes two fundamental types of changes in these traditional usage patterns. First, supervisors/managers and, especially, officers/detectives should make much greater use of analysis products to meet their newly delegated responsibilities in such areas as prevention, partnerships, and problem solving, as well as to enhance their geographically based knowledge and responses. Second, external demand for police data and information by citizens, community groups, and others should greatly increase as these entities take on more responsibility, in partnership with the police, for controlling crime and disorder. The legitimation of these external audiences for police data and analysis creates a potential quantum leap in the number and range of users of police information.

Table 1 compares usage patterns for each of the seven emergent information domains under professional-era policing and community policing.

Information Domain	Information Usage Patterns	
	Professional-Era	Community Policing
Community Interface	One-way flow of information; information incident-oriented and obtained in reactive situations; narrow range of information desired (just the facts); interaction mainly limited to officers/ detectives gathering raw data from crime victims and other complainants	Two-way flow of information; proactive and problem-oriented information emphasized; wide range of information desired; all levels of police organization need both raw data about the community and analysis products; much greater emphasis on providing information to the community
Inter-Organizational Linkages	Little information sharing among police and other types of government as well as non-governmental organizations; not seen as relevant or important	Substantial information sharing; crucial to effective problem solving; two-way flow of information; information needed by line-level problem solvers as well as by managers and executives
Work-Group Facilitation	Not seen as very important; incident-oriented policing primarily an individual-level activity	Problem solving and geographic focus enhance the importance of work groups; officers/detectives need more information in order to coordinate with their colleagues, and supervisors need more information to direct, control, and coordinate their subordinates, especially under conditions of functional diversity or temporal complexity
Environmental Scanning	Not seen as very important; primarily an executive-level activity; generally limited to serious crime issues in the community and major developments within the policing profession	Seen as an important activity at all levels of the organization (beat officers, area commanders, functional specialists, top executives); a wide range of issues are seen as relevant (crime, disorder, drugs, fear, community relations, economic conditions, sociodemographic conditions, new technology, professional developments, etc.); an important area for analysis, not just raw data

Information Domain	Information Usage Patterns	
	Professional-Era	Community Policing
Problem Orientation	Focus on incidents, not problems	Policing and police-community partnerships focus primarily on problem solving; thus, raw data and, especially, analyses need to be organized and aggregated so they contribute to problem identification, problem analysis, the search for responses, and assessment; these data and analyses must be available to problem solvers, i.e., officers/detectives, citizens, community groups, other government agencies and nongovernmental organizations, as well as police supervisors, managers, and executives
Area Accountability	Accountability primarily temporal (by shift) or functional (e.g., patrol, investigations); raw data and analysis not focused primarily on geographic areas	Accountability primarily geographic; thus, data and analyses need to be geographically oriented; police officers/detectives, work teams, supervisors, commanders, and executives all need geographically based information to carry out their responsibilities effectively; citizens, community groups, other government agencies, and nongovernmental organizations also need geographically based information to effectively collaborate with the police in dealing with crime and disorder
Strategic Management	Commanders and executives rely on a narrow range of information (crime, calls for service) when analyzing service demands and designing service delivery systems; police management much more reactive, tactical, and defensive than strategic	Police management more complex; wider range of objectives seen as relevant (crime control, order maintenance, fear reduction, public satisfaction, integrity, accountability); wider range of programs, policies, tactics, and strategies seen as potentially viable; thus, a more strategic approach to planning and management is required; this increases substantially the information needs of police executives

5   Analysis of Police Data

In the professional era, police agencies emphasized four types of analysis:

- Crime analysis. Focuses on trends and patterns in ordinary street crime.

- Operations analysis. Focuses primarily on calls for service.

- Intelligence analysis. Focuses on organized crime, drug trafficking, gangs, and repeat offenders.

- Administrative analysis. Focuses on a variety of organizational issues as they arise, such as budgets, personnel turnover, fleet maintenance, and property inventory.

Under community policing, to support new information usage patterns and the key elements of COP discussed previously, these types of analysis remain important and cannot be ignored. They may, however, undergo significant change. Crime analysis, for example, may become more geographically focused and also more attuned to the needs of officers/detectives and citizens/community groups. Operations analysis may become less concerned with response times and equalizing call-for-service workloads across shifts and more concerned with matching resources to problems.

In addition, several other types of analysis become salient in the COP context:

- Community analysis. Focuses on the characteristics of neighborhoods and communities, including such conditions as fear, disorder, and police-community relations, as well as socioeconomic and demographic characteristics.

- Problem analysis. Focuses on specific problems that have been, or should be, targeted by officers/detectives and their collaborative partnerships, including but not limited to hot spots analysis.

- Program evaluation. Focuses on assessing the effectiveness of programs, tactics, and strategies.

- Policy analysis. Focuses on anticipating the consequences of various policy options.

Although each of these new types of analysis might serve multiple audiences, community analysis and problem analysis tend to produce information of particular value to COP operatives (officers, detectives, citizens, community groups, etc.), whereas program evaluation and policy analysis primarily serve the needs of managers and executives.

6 Information Systems

Corresponding generally to the traditional users of police information and types of analysis emphasized during the professional era, three types of police information systems have traditionally predominated:

- Operations information systems. Include the police radio, police records, NCIC, MDTs, MDCs, cellular phones, etc.; designed to supply police officers and detectives with raw data on such topics as calls for service, persons, property, and vehicles.

- Command and control systems. Comprise operations information system components plus 911, E911, CAD, vehicle locator systems, etc.; designed to aid supervisors and managers in directing and controlling their subordinates, especially patrol officers.

- Management information systems. Consist of various databases pertinent to the internal management of the police organization, such as officer productivity, citizen complaints, and inventory; designed to aid managers and executives in carrying out their administrative duties.

Adjustments to each of these three types of information systems are called for under community policing. For example, operations information systems need to supply COP operatives with more geographically based information, more information about problems and not just incidents, and more analysis products instead of just raw data. Command and control systems need to focus less on efficient incident handling and accountability for each minute of time, and more on effective problem solving and on accountability for conditions in geographic areas of responsibility. Similarly, management information systems need to focus more on substantive issues and on quality rather than just on internal administrative processes.

In addition to these adjustments to existing systems, COP creates a need for at least three other general types of police information systems:

- Geographic information systems. Systems that relate data to locations and that result in maps and other products pertinent to identifying and analyzing geographically based problems and conditions, and the way they change over time.

- Problem-solving information systems. Databases and systems that capture information about completed and ongoing problem-solving efforts and that aid officers and citizens in identifying, analyzing, and responding to substantive problems in communities.

- External information systems. Systems that aid the police in obtaining data and information from other organizations and from the public, and that also aid those entities in obtaining information from the police.

7 Summary

The line of reasoning in this report has proceeded as follows:

- Community policing includes a number of elements with information-related implications, including citizen input, geographic focus, prevention emphasis, partnerships, problem solving, and management.

- COP changes the types of information needed by front-line police officers as well as by managers and executives, and it also creates new information users, citizens, community groups, other government agencies, and nongovernmental organizations.

- COP also changes the types of analysis that police departments need.

- Existing police information systems need to be adjusted and new systems developed to provide the data required by analysts and by COP operatives.

- These factors point to seven domains of police information that are critical to the successful implementation of community policing:

    — Community interface
    — Inter-organizational linkages
    — Work-group facilitation
    — Environmental scanning
    — Problem orientation
    — Area accountability
    — Strategic management

Among the questions that these observations raise are the following:

- What will it take to meet the new information needs associated with community policing?

- What new data sources, information processing technology, and data analysis methods will be required?

- What systems have already been developed by leading-edge police agencies?

These are some of the issues that the ISTEP project is designed to address.

8 Conclusion

Clearly, community policing creates both new and qualitatively different information needs for police agencies and their COP partners. It would be a mistake, though, to

assume that all that is required to satisfy these new needs is advanced information processing technology. Besides technological solutions, police departments seeking to fully implement community policing could benefit from guidance and support in three other areas: (1) reconceptualizing the domain of police-related information; (2) locating and gathering new types of data; and (3) analyzing data and producing information that is timely and relevant. These three elements of the solution to the information-related needs created by COP may be every bit as challenging as the seemingly more advanced technological aspects of the situation.

What seems clear from the reported experience of departments that are seeking to fill these needs is that the approaches taken should not be defined and driven by vendors. Any company marketing hardware and software must place the development and dissemination of its own products as its primary objective. That is normal and appropriate. Police departments, however, need a broader perspective on these issues than any single vendor can provide. ISTEP is deliberately organized to avoid any dependence upon or even association with particular products or vendors. A long-run ISTEP objective is to provide police departments with specific recommendations concerning the products that are appropriate and suitable for particular needs.

Chapter **2**

Police Department

Information Systems Technology Enhancement Project

ISTEP

Case Study: Tempe, Arizona

Contents

Tempe Highlights

Community policing is in the operational fabric of the Tempe Police Department. Since the department adopted the philosophy in 1988, Tempe residents have come to expect innovative action and proactive policies from their police force. Officers working specific beats must develop problem-solving goals with their supervisors. To support this strategy, officers are assigned to beats for a minimum of one year. The department also created a Problem Solving Process manual which includes a format for problem-solvers to track their efforts and time spent on projects.

The city of Tempe reorganized its information systems in 1998 by eliminating autonomous technology units within city divisions. A centralized Information Technology Division (ITD) was formed to develop a more integrated effort. The city assigned an ITD business analyst to the police department to serve as a liaison and an advocate for the department. An important advantage of ITD is the city's ability to purchase hardware and software in larger quantities and at a lower cost than individual divisions would be able to do. This reorganization has also helped the police department to be more successful in planning information technology acquisitions to support community policing.

The Tempe Police Department has established a Workload Committee to analyze operational and administrative data for resource allocation planning. The department is using a software program – Staff Wizard – to help analyze these data to develop beat officer staffing schedules. This software has been a great tool for not only the Workload Committee, but for general operations analysis.

Much of the responsibility for using internal police information systems to support community policing rests with the Crime Analysis Unit. Arguably one of the most accomplished crime analysis units in the country, the staff perform three types of analysis – tactical, strategic, and administrative. This unit provides police information to citizens of Tempe either via the Tempe Police web site or by individual request. The major products produced by the Crime Analysis Unit are monthly reports on police activity and crime, an ongoing series of tactical crime trend reports, and monthly and annual reports on crime and calls-for-service by specified land uses. The unit also conducts an annual citizen survey and prepares a report summarizing the survey findings.

The department's web site is maintained by the Crime Analysis Unit as well. The site is elaborate and contains several categories of information from crime prevention tips to a sex offender database. The Tempe Crime Analysis Unit is most importantly a key component in forging a community interface with residents.

1   Purpose and Scope of Report

This case study is one of several produced for the Information Systems Technology Enhancement Project (ISTEP), a project funded by the Office of Community Oriented Policing Services. The aim of ISTEP is to increase the use of information and information technology in police departments, particularly regarding the implementation of community policing. The case studies document the current state of information technology and the use of information in five police departments: Tempe, Arizona; San Diego, California; Hartford, Connecticut; Reno, Nevada; and Charlotte-Mecklenburg, North Carolina. These case studies are based on a limited review of the status of information technology in the departments. A separate cross-site report synthesizes the findings of the individual case studies. A report on the project's conceptual framework presents the overall ISTEP approach and discusses how community policing demands different types of information systems, analysis methods, and uses of information than those required under the professional-era model of policing.

The Tempe, Arizona, ISTEP case study is based on two site visits to the Tempe Police Department. The Abt ISTEP team conducted the first site visit on August 16-19, 1998. The focus of this visit was to review technology history, use, and plans for future development and to collect documentation on the department's use of information technology, especially in support of community-oriented policing. The ISTEP team interviewed the administrator of the Office of Management, Budget and Research (OMBR), and the commander of the Support Services Division. The team also observed a meeting of the Criminal Justice Advisory Committee (CJAC), which is composed of a group of representatives from the city court, city prosecutor's office, Community Services, the police department, and the city's Information Technology Division (ITD). The purpose of this group is to technologically integrate and operationally maximize the efficiency and effectiveness of the criminal justice system in Tempe. The ISTEP team also interviewed a crime analyst in the Crime Analysis Section. A business analyst working for the city of Tempe Information Technology Division within the police department, and the command staff were also interviewed. The command staff interview included the chief of police, four commanders (North Patrol, South Patrol, Investigations, and Support Services), and the administrator of OMBR. Ride-alongs with officers were also conducted.

The second visit to the department took place on January 12, 1999, with telephone follow-up interviews conducted on January 13, 1999. On-site interviews were conducted with a crime analyst, a business analyst, a beat sergeant assigned to the North Division, and the commander of the North Division. Additional information was collected after the site visit through telephone follow-up and meetings. The focus of this visit was to glean information on community and problem-solving policing operations, to obtain an update on IT developments, and to fill in other ISTEP-related information gaps.

The organization of this case study document follows the overall conceptual framework for the ISTEP project. Accordingly, after providing background information on the police department in Section 2, particularly with respect to implementation of community policing, the case study describes current and planned information systems (Section 3), analysis methods (Section 4), and uses of information (Section 5). Section 6 summarizes our findings.

2   Police Department Background

2.1   Size, Overall Organization, Crime Levels, and Trends

The Tempe Police Department serves a city of 158,000 residents and encompasses an area of 40 square miles. There are 406 Tempe police employees: 291 sworn officers and 115 civilians. The department also uses, on average, 130 volunteers, who work an average of 10 hours each per month. The department is organized into four divisions: North Patrol, South Patrol, Investigations, and Support Services, each headed by a commander. Geographically, the department is organized into two patrol divisions, North and South. The North Division covers 16 square miles, and the South Division covers 23.8 square miles.

Tempe is a university city with an economic base of service-related and light industries that include a strong technology sector. The city is the home of the main campus of Arizona State University, one of the nation's largest public universities. Tempe is known as a "special events" city, with major tourist attraction activities such as the annual Fiesta Bowl.

In 1997, the police department received 118,652 calls for service. The most frequent calls for service were burglary alarm calls (11%), traffic accident calls (8.5%), suspicious activity calls (7.4%), check the welfare calls (5.6%), and both theft from vehicle and loud music/noise/party calls (5.4% each). There were 15,217 Part I crimes in 1997, or 9,619 per 100,000 residents. These included 12 homicides, 72 forcible rapes, 280 robberies, 504 aggravated assaults, 2,197 burglaries, 10,223 larcenies, and 1,883 motor vehicle thefts. Part I crimes have increased slightly over the past five years, with most of the increase in the area of larcenies and modest increases in violent crimes (1997 Report on Policing in Tempe).

2.2   Community-Oriented Policing Background

The Tempe Police Department maintains an ongoing commitment to community-oriented policing (COP). The department also enjoys a reputation as a COP pioneer; but it appears that in recent years the department has been searching to find a balance between COP and the public's demand for maintaining superior traditional police services. Maintaining this balance is tough for all departments committed to a department-wide philosophy of community policing. The Tempe department consistently reviews community priorities and performs internal assessments to help in the process.

COP is evidenced in several ways, including COP training for new officers after they complete recruit training, a requirement for setting beat goals that entails problem solving, a strong emphasis on interface with the community through meetings, and the direct provision of information on crime and crime-related issues.

Officers are assigned to one of 15 beats and, along with their supervisors, are held responsible for them. Beat integrity is a feature of the Tempe Police Department operational practice, and officers generally work in the same beat for a year. In addition, knowledge of and commitment to COP is taken into consideration in selection, promotional practices, and performance reviews. Recruits and field training officers are encouraged by patrol commanders to pursue COP principles and practices. Recently, the department established a work group charged with developing a system for tracking officer time spent on community policing in an attempt to integrate COP-related efforts as a more systematic part of workload and activity measurement.

Although commitment to community-oriented policing and problem solving is not uncommon to innovative departments, such commitment varies from one division to another, from one beat to another, and between command and line staff. Some beats are described as having significant problem-solving activity, while others have less activity. Supervisors point out that the commitment to COP by line officers depends upon the individual. The difference in COP between the South and North Divisions appears, in part, to be a function of differences in the characteristics of the areas encompassed by the beats, as well as of the management styles of the commanders responsible for those divisions. Although both the South and North Divisions practice community policing, the effort is managed differently in each. The varied management styles may actually benefit the department, as staff can assess the effectiveness of each style.

2.3   Extent of Departmental Efforts in Community Policing

Solicitation of Citizen Input

The Tempe Police Department uses a variety of methods for soliciting citizen input to help with the implementation of community policing. These methods include an annual community survey, neighborhood meetings, and a policy that encourages citizens to call beat sergeants to voice concerns or obtain information. Several information products are produced by crime analysis and targeted for distribution and consumption by Tempe residents. These include results from the community survey, monthly Part I crime statistics by beat, maps to help citizens locate their residence within a beat, and various reports on crime in apartment buildings and mobile home parks. The Tempe Police Department Web page is an important means of disseminating this information. The community survey is the responsibility of the Crime Analysis Unit and is conducted annually with the assistance of student interns from Arizona State University. The survey provides the department with an indicator of citizen perceptions of police performance, as well as a measure of citizens' feelings of safety and security. The survey also provides information used to help set priorities for service delivery.

Geographic Focus

The department practices geographic assignments to support community policing. Patrol officers work within specific patrolling areas and remain in these areas for at least a year. Emphasis is placed on maintaining beat integrity. Tempe is organized into 15 beats, which are drawn using both natural geographic boundaries and analysis results from calls-for-service data. Each beat has a sergeant assigned to coordinate the efforts of the officers on the shift beat team. The sergeants are required to set three goals for their beat each year. Beat officers seem to be well aware of requirements for beat problem-solving projects, and officers and line supervisors appear to develop an intimate understanding of the neighborhood encompassed in their beat.

Emphasis on Prevention

The Tempe Police Department places considerable emphasis on crime prevention. Evidence of this is the department's commitment to crime prevention through environmental design (CPTED), as well as the production of newsletters and bulletins that promote crime prevention. The city has a CPTED ordinance, and the Tempe Police Department has two officers assigned to the city department tasked with reviewing building permit applications, construction plans, and site inspections. This arrangement is under review, however. It appears that the department may be forced to reassign those officers to other duties in the crime prevention unit, since these positions are not being integrated and supported by city Development Services.

The city also has a program to promote crime-free multi-housing, and the Tempe Police Department plays a significant role in supporting that effort. Crime analysis generates ongoing reports of crime in public housing that serve as a basis for the development of specific crime prevention measures. The department also publishes and distributes a 75-page Practical Guide for Landlords, Tenants, and Property Managers in an effort to decrease illegal activity and nuisance problems in multi-housing areas.

The Crime Prevention Unit offers several community-involved proactive programs to address crime and fear-of-crime issues, including the Citizens on Foot Patrol program, which involves residents observing and reporting incidents to police using cellular phones. The unit also offers residential security surveys, neighborhood watch programs, and citizen police academies to help citizens understand police work and encourage them to partner with police to prevent crime.

Problem-Solving Orientation

The practice of problem solving is well ingrained in the organizational culture of the Tempe Police Department. Beat sergeants and beat teams identify problems and develop responses. Beat sergeants call on crime analysis for assistance in identifying crime patterns and trends, and officers and supervisors receive training in problem solving. The systematic use of a problem-solving system has recently been codified in Tempe Police Department's Problem Solving Process. Department staff now fill out community-policing project forms when a problem solving project is identified. The

form requires them to fill in information on project type, description, objective, strategy, results, and actions taken. Also unique in the process is that exact hours spent on these projects are documented to show dedicated levels of staffing for the project. These hours can be aggregated to determine the total amount of time officers have devoted to community policing and problem solving. This process will enable Tempe to continuously assess the effectiveness of problem solving.

Adoption of Community-Oriented Policing Management Styles

Management has a strong commitment to COP, and COP principles and practices seem to be an important force in department planning and resource allocation. Management supports COP, problem-solving training, and capacity building, and the COP emphasis is reflected in the selection and promotion of managers. The department uses calls-for-service studies as a baseline pointer for their strategic planning process that drives the departmental priorities and direction. A Workload Committee is trying to develop a system to factor COP activity into resource allocation and the strategic planning process by analyzing calls-for-service loads.

2.4   Community-Oriented Policing Training and Assessment

Beat officers receive training in COP when they go through the basic police officer training course at the Phoenix Regional Police Academy. The regional academy uses an integrated approach to COP training: COP concepts are integrated throughout the basic 614-hour police officer training curriculum. Officers also receive approximately 40 hours of additional training in COP provided by the Tempe Police Department when they complete recruit training. Officers are evaluated in field training on community policing, including problem-solving activities, resource utilization, interaction with community members, and community awareness and service. Officers are also evaluated on their commitment to COP in their daily and weekly probationary and annual evaluations. Emphasis is placed on having Field Training Officers reinforce COP values and practices. In-service training opportunities on COP-related topics are also made available to beat officers.

Since most supervisors come up through the ranks, they receive much of the same COP training as beat officers receive. In addition, supervisors (both sworn and civilian) and management staff are active participants in State, regional, and national organizations and conferences that present them with important opportunities to acquire information on COP practices and trends. This includes the programs of the Arizona Community Policing Institute.

The department has a solid commitment to community-oriented policing and has implemented the philosophy for several years. The Tempe Police Department can probably be thought of as a second-generation COP department. COP appears to be ingrained in the department and is practiced as part of the way in which the department conducts business. The department's openness with the community and willingness to share detailed information with Tempe residents is important evidence of this commitment.

3   Information Systems

3.1   Information Technology Staffing and Responsibility

As in many police departments, Information Technology (IT) responsibility was housed, until recently, in the Information Management Bureau (IMB) organized internally under Support Services. Technology came to be located in Support Services because it was seen as an essential tool to support community policing by the command staff. Politically, the police department maintained considerable independence and autonomy from city government. This was the case for some time, as the city viewed the department as fully capable of managing its own affairs. The department did respond effectively to political, financial, and intellectual forces in growing its technology capabilities. IT decision makers began formal planning early on by coordinating the gradual phase-in of new IT infrastructures related to communications, records management, and CAD systems. As the cost and complexity of technology increased, however, the city took steps to centralize all IT, police included.

In May of 1998, the city reorganized IT and centralized all departmental IT units into one city Information Technology Division (ITD). This was seen as a positive move by some in the command structure, but many patrol commanders and communications staff were not so willing to hand over control of IT. Financially, it made sense for the city to coordinate IT; the city could better integrate systems and, through economies of scale, buy in bulk more efficiently. Further, the police department appeared to be stagnant on many pressing issues, including systems coordination, management, liability, and upgrading computers. As a consequence, the city-centralized IT came at an advantageous time for the Tempe Police Department.

3.2   State of Information Systems

As noted, Tempe has recently undergone a reorganization into the Information Technology Division. As of May 1998, the city reorganized its technology information assignments. As a result, the police department lost four civilian positions to the city. In most cases, this meant that a city employee (known as a business analyst) was assigned to each division of city government.

The decision by the city to absorb the four police positions and the responsibility associated with them seems to have been precipitated by a request from the police department to replace their laptops at a cost of more than $5,000 per machine. The absorption of these positions by the city is generally seen in positive terms by the department. This positive perception is linked to the view that the police will fare well in almost any decision-making process, that the city will absorb a large chunk of the risks involved in decision making, and that the city has deeper pockets than the police department.

This reorganization was done as a consequence of a needs assessment conducted by the city. The bias in the planning process was toward integrating IT across city departments. Over the past two years the city has standardized the Oracle database for all

mid- to large-size databases. These databases are managed by the centralized Data Management section of ITD. Now, all remote sites can access all database servers.

The police department suspects that future IT improvement projects and recommendations will receive more support, since these recommendations will come from the city and will not be seen as self-serving. The reorganization meant that the Criminal Justice Automation Committee and the Criminal Justice Operations Committee were merged. In addition, the police department is optimistic about the changes because many needs that were left unmet will be addressed. Historically, the police department thought that certain needs were to be met by the city, and the city assumed that the police department was to meet those needs. In reality, neither group met the needs of the other. Overall, the Tempe Police Department command staff views relocating the IT function into the city as a compromise between fiscal needs and control.

Another obvious advantage of centralizing IT responsibility is that city IT employees are more capable of handling IT decisions than police employees. They are more knowledgeable on various IT systems and platforms and hardware and software upgrades. The department also saves the costs of training sworn staff on IT systems and software.

The Tempe Police Department's involvement in technology early on appears to be the result of leadership and financial resources. Fifteen to eighteen years ago, commanders and lieutenants led the charge for greater use of technology. Tempe is a relatively affluent city with significant fiscal resources and was in a position to add technology. In addition, the presence of Arizona State University in Tempe has meant that expertise has been readily available to the city in areas such as crime analysis and computer engineering. To date, Arizona State has provided interns and assisted with annual surveys.

Although commanders and the Tempe Police Department chief indicated that a commitment to community-oriented policing helped the city get more involved in technology, it is difficult to directly link IT to COP. It appears that the primary means by which the Tempe Police Department's commitment to COP has been put into action in Tempe is through neighborhood policing. The most obvious link of IT and COP seems to be through crime analysis, with data being analyzed, reported on, and mapped at the level of the beat or sub-units (reporting districts) within beats.

3.3 Information Systems Related to Professional-Era Policing

Operations/Command and Control Systems

The department's computer-aided dispatch (CAD) system was originally acquired in 1982. The CAD architecture consists of one centralized minicomputer talking to mobile data terminals (MDTs). The system uses Public Safety Systems Incorporated (PSSI) designed and supported software. The records management system (RMS) is

about 12 years old. Both the RMS and the CAD have been updated regularly. The department uses ALERT as its primary RMS and a response CAD system; both are produced by PSSI and, therefore, communicate well with each other. ALERT has a calls-for-service module that is synchronized daily. ALERT users can access CAD data as little as 24 hours old. A major short-term goal is to have a stand-alone RMS that will be year 2000 (Y2K) compliant.

Motorola MDTs are in the process of being replaced. All cruisers are being fitted with dockable Panasonic laptops that will communicate and transmit data using radio frequency (RF) technology. Beta testing of these units is complete, and department-wide installation was scheduled for completion in January 1999. Installation was delayed due to problems in securing mounting hardware for the units. For several years, officers and cruisers have been issued laptops with limited applications, such as field reporting. The new Panasonics will combine MDT functions with a yet-to-be-developed automated field reporting (AFR) system. This system should be developed and in place sometime in the year 2000.

Management Information Systems

Management information systems (MIS) in the department encompass elements from the department's entire menu of IT operational applications and specialized applications related to personnel management and budget. One specialized MIS application used heavily by the Tempe Police Department is Staff Wizard. This resources-allocation application uses a variety of data – including calls for service, average response time for calls with varying priorities, and miles patrolled to provide an approximate "best schedule" for officers. The software is instrumental in shaping decisions about officer deployment. The Staff Wizard program is an information tool operated by the Crime Analysis Unit and patrol management. The information produced is given to commanders who then have sergeants and lieutenants review drafts of schedules and provide command staff with feedback.

3.4   Information Systems Related to Community-Oriented Policing

Geographic Information Systems (GIS)

The GIS software standard for the city is MapInfo. GIS technology in the police department is managed by the Crime Analysis Unit. This unit uses MapInfo to prepare a variety of maps and reports that are used throughout the police organization; the primary customers of GIS/crime analysis applications, however, are seen as beat sergeants, line officers, and detectives. GIS applications are limited to the use of crime and calls-for-service (CFS) data. Unfortunately, there do not appear to be any near-term plans to provide beat officers direct access to GIS-based information via the new Panasonic laptops.

Crime analysis also produces a number of maps that can be accessed by citizens on the Tempe Police Department website. These include monthly Part I crime hot spot maps and beat maps. Maps are based on reporting districts, and specific address information is not available to citizens, although they are able to determine the reporting district location of their own address.

Problem-Solving Information Systems

At this time the department has no information systems or software dedicated to problem solving, although such a system is being developed. The 1998 Tempe Police Department Workload and Activity Measurement System Strategic Plan notes that there is not a consistent method for tracking the problem-solving activities of officers or the amount of time spent on such activities. The impetus for the development of such a method seems to be officer concerns about "checking-off" and being out of service on COP/POP activity and, as a result, missing opportunities to respond to basic calls for service. There is concern that the COP emphasis may have resulted in a reduction of traditional police services. In an effort to catch up, the department hired an intern to develop a method for documenting problem-solving projects that inventories the problems addressed and methods employed.

A related goal is the development of a CAD-based system for documenting officer time spent on problem solving that permits automated level-of-effort data aggregation and summarization. The goal is to be able to quantify such activity in order to incorporate it into performance reviews and strategic management decisions related to department resource allocation. The department evaluates officer performance on both traditional (e.g., CFS-based arrests) and COP activities. Under the "Additional Work Group/Team Support Activities" section of the Performance Evaluation Form, officers are evaluated on team project participation, proactive problem solving, and beat ownership.

3.5   Relationships and Experience with Vendors

The department interacts with software and hardware vendors on an as-needed basis. There does not appear to be a regular set of meetings or ongoing communication, even with vendors that the department has a relationship with. Overall, vendors have played a minor role in determining departmental needs, even though the Tempe Police Department relies on vendors for beta testing all new systems. Since it has been some time since a complete new system (RMS, CAD) has been purchased, there is little information in the way of recent precedent to guide the department.

3.6   Future Acquisition and Development Plans

Although the CAD and RMS are dated, they have been improved regularly and there is no plan to replace them. The view is that they are an acceptable platform for IT that can be upgraded over time when funding is available. The police department and ITD are in the process of upgrading the RMS from a host-based system to a client-server system. The department stressed that this will increase the ability to query data for analysis.

"Ruggedized" Panasonic computers have been purchased to replace Motorola MDTs. The new MCTs/laptops are capable of displaying calls for service and canned or prepackaged information from Crime Analysis, including mug shots and police reports. Another major technology effort at the current time is the document-imaging project being conducted in the Records Bureau. This project is of considerable inter-

est throughout the department. The project calls for scanning the document number and crime report as an attached file and feeding the scanned data into the department's Oracle database.

Much of the IT development effort is devoted to updating old DOS-based applications that are no longer supported and bringing them into the Windows environment. The replacement of field reporting software is also a priority, and a major component of this effort will be expanded field reporting capabilities, including vehicle/accident reporting. Automating field interrogation files and improving the GIS capabilities of the dispatch system are two additional IT development goals. It should be noted that Tempe is in the process of implementing a three-year strategic plan known as the "Management Services Information Technology Strategy Plan 1998-2001."

3.7 IT Training

Training for technology applications is fulfilled by a semi-formal train the trainer approach. For example, a small cadre of 10-12 interested officers volunteered to be trained to use the new Panasonic laptops, and these officers will provide the department with the capacity to train additional officers as the new technology comes on line. Traditional technology training (e.g., MDTs) is carried out as part of the on-the-job/field-training-officer (FTO) training process. The Arizona Police Officer Standards and Training Board (POST) academy also now includes computer training. Crime analysis training for officers is provided either during a 3-week post-academy training or during their 14-week field training.

4 Analysis Methods Used

4.1 Professional-Era Analysis Methods

Crime Analysis

The Crime Analysis Unit performs tactical, strategic, and administrative crime analysis. The Tempe Police Department is divided into two command areas, North and South. Each command area has one crime analyst assigned to it. Part-time analysis assistants and Arizona State University student interns make up the rest of the unit's staff. The physical location of the crime analyst within each patrol division has important implications for the demand, flow, and use of crime analysis information. The North Command Area is in the same facility as police headquarters. The crime analysis office is located near the general public reception area, an area that receives less traffic from patrol officers and their supervisors than does the South office. The principal clientele for the crime analyst located in that office includes administration, detectives, and citizens. The crime analyst for the South Command Area is located next to the patrol assembly area, and placement in that location generates considerable interaction with patrol officers and their sergeants. Queries from officers and beat sergeants constitute the principal source of requests for information directed to the South Command Area crime analyst.

The major information products produced by the Crime Analysis Unit are monthly crime, calls for service, alarm, and accident reports; ongoing series of tactical crime trend reports; and monthly and annual reports on crime and calls for service in schools, apartment communities, and mobile home communities. In addition, the unit conducts an annual citizen survey and prepares a report summarizing the survey findings. The unit also prepares custom reports in response to requests from all departmental units, other units in city government, and community agencies. The Crime Analysis Unit has a well-developed Web page and regularly posts most of the information listed above.

Operations Analysis

One important form of operations analysis is the use of calls-for-service data to develop beat-officer staffing schedules. Staff Wizard, developed by Corona Solutions, is the software application used for this purpose. It uses CFS data and other operations and administrative data to generate draft schedules that are reviewed by supervisors, who then make recommendations for schedule adjustments to the department command staff. Tempe was a test site for Staff Wizard. Corona Systems worked with the department to test, modify, and refine the software.

Intelligence Analysis

Intelligence analysis is largely the responsibility of specialized operational units (e.g., drugs, gangs). The Tempe Police Department is an active participant in various metro task forces and accesses intelligence maintained by those task forces. The Arizona Department of Public Safety maintains several extensive intelligence databases that are shared with police agencies throughout the metropolitan area.

4.2   Community-Oriented Policing Analysis Methods

Community Analysis

The Tempe Police Department has access to a variety of citywide criminal justice and non-criminal justice databases. The non-criminal justice databases include census information, commercial permits and licenses, traffic engineering, and housing data. One goal is for city IT to develop a data warehouse populated by these and other city databases. At the present time, the use of non-criminal justice databases is somewhat limited, although crime analysis uses them to prepare reports that overlay crime data on various data sets. Examples include reports on crime in mobile home parks, apartment communities, parking lot locations, parks, and schools.

Problem Analysis

The approach to problem analysis at the Tempe Police Department was previously ad hoc. However, as mentioned earlier in the document, the department is using a newly created Problem Solving Process form and tracking system that requires staff to fill in

information, once a problem is identified, on project type, description, objective, strategy, results, and actions taken. This formalization of problem identification and follow-through should produce more accountability in problem solving.

Prior to this process, most problem analysis was conducted by the Crime Analysis Unit at the request of beat sergeants and officers who were setting and working on beat goals. It should be noted, however, that although many of the reports prepared by crime analysis can be thought of as problem analysis, the depth of these analyses is limited by the reliance on narrowly constructed databases. The department's Oracle database, which is the principal source of incident report data in the department, is described as difficult to manipulate. Also, problems with cleaning data in the Oracle database have been reported. Both of these factors make its direct use by officers and sergeants nearly impossible.

5   Use of Information

The ISTEP conceptual framework identifies seven information domains that are critical to the successful implementation of community policing. The seven domains are community interface, inter-organizational linkages, work-group facilitation, environmental scanning, problem orientation, area accountability, and strategic management. In each of these domains, information technology can, if properly applied, greatly enhance the effectiveness of community policing.

Each of the five police departments that ISTEP staff have visited excels in one or more of the seven domains. The following discussion details Tempe's participation in the seven information domains.

5.1   Community Interface

The Tempe Police Department maintains a strong interface with the community, and the strength of that interface is probably a function of the community and department's history. Tempe has maintained the police-community relationship that existed when both were much smaller entities.

The Tempe Police Department maintains an elaborate website that provides a large amount of information to the community. Included are pin-maps of crime trends, thematic maps of beats and reporting districts by crime and calls for service, and beat maps that indicate the streets and numbers of the reporting districts. Even the addresses, names, and photographs of registered sex offenders can be accessed. The Web page takes on added significance in a community such as Tempe, which is a major university town with a significant IT base. On a per capita basis, Tempe citizens probably have greater Internet and World Wide Web access and skills than those found in other communities of similar size. It follows that emphasizing the use of the World Wide Web to promote community interface makes a great deal of sense in a community like Tempe.

The department has increased the use of cell phones, e-mail, and voice messaging in recent years. Beat sergeants and officers are expected to respond directly and promptly to inquiries by citizens. Officers are expected to give out cards that contain telephone contact information. Crime analysis will respond directly to citizen requests, although a small fee is charged for analysis and production of custom reports. Community meetings, newsletters, and extensive involvement of police managers and command staff in civic organizations are some of the low-tech approaches to community interface in Tempe. The department also coordinates Citizens on Foot Patrol, which involves residents observing and reporting incidents to police using cellular phones.

Additional interfaces include the department's use of cable channel 11, neighborhood block watch and association meetings, an annual neighborhood problem-solving meeting, and a Youth Police Academy.

5.2   Inter-Organizational Linkages

The recent centralization of IT into one city department is probably strengthening the Tempe Police Department linkages with other organizational units of the city. Two of the perceived benefits of the arrangement are better access to the financial resources of Tempe's Information Technology Improvement Program (TIP) and increased capacity for successfully implementing major technology projects. Linkages with the Development Office result from the city's CPTED ordinance and the assignment of officers to that office to conduct CPTED reviews. Similar linkages exist with the housing office in conjunction with the public housing program. The department has a Crime-Free Multi-Housing Coordinator who works with managers and residents from apartment communities to make them safer and uses CFS, crime, and other data to problem solve. The ITD business analyst assigned to the police department also serves as an important avenue for information exchange between the Tempe Police Department and other city agencies represented in the IT department.

The Criminal Justice System Integration Committee provides another set of important inter-organizational linkages. The committee is composed of the following members: the Deputy Court Administrator, the business analyst for the Court and Prosecutor, another representative of the city courts program, a data manager for ITD, the business analyst for the Tempe Police Department, the Civil Court budget manager, the jail automation manager, the Supervisor of Diversion Services (probation), the Manager of Police Records, and the Tempe Police Department's Commander of Support Services, who serves as committee chair. The goal of this committee is to produce a single point of entry (and exit) for criminal justice data, and to integrate operations. The new committee structure is a direct consequence of the 1998 decision to move the Tempe Police Department's IT into the city ITD.

5.3   Work-Group Facilitation

The department has provided all supervisors with team and facilitation/meeting skills training. The department has cross-functional teams, including a policy team, management team, and specific committees addressing various issues. However, cross-shift and cross-unit coordination is largely a function of informal contacts and arrangements initiated by the beat sergeant. This seems most evident in communications and facilitation between patrol shifts. E-mail capabilities, as well as shared reports, including those produced by the Crime Analysis Unit, provide a basis for some cross-shift, cross-unit communication and information sharing.

Regularly scheduled command staff meetings can cover a range of topics, including substantive problems in the community. The focus on community problems, when it occurs, can lead to coordination across units, shifts, and city agencies as the command staff attempts to impact these problems.

5.4   Environmental Scanning

Systematic environmental scanning is improving. The Tempe Police Department is in the beginning stages of developing a systematic approach to environmental scanning. The new Workload Committee is using a variety of department and city databases to make mid-range projections of demand for services and workload impacts. That effort appears likely to evolve into a formal, ongoing strategic planning process with scanning as an essential part of the process.

The reports on crime trends prepared by crime analysis represent a form of scanning, albeit somewhat informal. Although crime analysis develops a large quantity of useful information, it does not appear to be used for systematic scanning by management. The department's coordinated efforts with city agencies, such as traffic engineering and planning and development, also involve it in limited scanning processes.

5.5   Problem Orientation

The problem orientation of the department has been somewhat informal, although the department has improved the process and is clearly committed to community-oriented policing, with problem solving being an important COP strategy. The training of new officers and supervisors in COP/POP reflects this commitment, as do promotion and selection processes. The requirement for beat sergeants to set three annual beat goals also reflects the department's problem orientation.

Crime analysis data, which are largely CAD-generated data, are the principal source of information used to inform SARA-like problem solving (scanning, analysis, response, and assessment) in the department. These data must be accessed through the Crime Analysis Unit, and that unit indicates that sergeants setting beat goals are among their most frequent customers. Crime analysis will produce custom reports and maps and limited analyses on request. POP/COP activity is documented in the

daily activity reports, logs of beat officers, and in the recently developed problem-solving forms.

Some officers seem to lack an understanding that problem solving is frequently a long-term process, and community-oriented policing is viewed more as a program than a philosophy. Consequently, these officers tend to see COP in discrete terms with a beginning and an end.

5.6   Area Accountability

Although area accountability is accomplished through the organization of the department's two major geographic divisions into 15 beats, the beats were not created using specific neighborhood boundaries. They are broken down into reporting districts, however, for more effective analysis. The patrol officers are assigned to a beat, and the department uses a beat team concept. Assignment to a beat is usually for one year. A sergeant is assigned to a beat for two years, with responsibility for coordinating the work activity of the beat team. Most of the 15 beats have a satellite office, usually co-located in and donated by a business, school, or other city department. Sergeants are responsible for setting problem-solving goals, and problem solving is taken into account when annual performance reviews are conducted. GIS applications support the beat and reporting-district boundary delineation and activity data within those areas.

5.7   Strategic Management

Management appears to be concerned about developing a balance between community policing and traditional police service. There is a perception by some in the community that too many resources allocated to COP may have resulted in a reduction in traditional services, such as responding immediately to all calls for service. Management describes COP as an ongoing challenge for the department – the goal being to provide traditional police services while still doing POP and COP through participation with the community, in an appropriate balance.

The establishment of the Workload Committee is a result of this concern for balance, and one of the committee's objectives is to develop an approach for workload allocation that reflects an agreed upon balance of traditional and COP police activity. For example, under the present system, an officer doing COP or POP "checks off" with dispatch and is out of service (red light) and unavailable to respond to a call for service (green light). The committee is looking at the possibility of creating a conditional status (amber light), so that an officer could be performing COP/POP activities but still be available to respond to calls. The concern about balance is also reflected in the development of the POP activity tracking system. The focus of that new system is to capture officer time spent on COP/POP so that it can be quantified and part of an overall officer deployment and resource allocation system.

5.8   Other Uses

Use by Officers, Detectives, Management

Increased use of IT by officers, detectives, and management will most certainly occur in the near future. The new laptops that will soon be in place will provide increased access to information by officers. Officers are allowed to take home the personal computers assigned to them. A new AFR system will provide an improved source of incident-level data. Aggregate data and future developments in the computerization of field interview files will be important information resources for officers and detectives alike. The POP activity tracking system will also be used by management in support of planning and budgeting.

Use by Others

Citizens and other city agencies are likely to increase their use of Tempe Police Department police-related data in the future. The creation of a Tempe data warehouse will provide some direct access to data by other city agencies. Increased integration of criminal justice system data will provide non-police criminal justice agencies with greater access to police data and will provide the police with greater access to other types of data. Increased awareness of the police-related data presently available to citizens on the department's website will probably result in a demand for more information and in the use of that data to support citizen-driven strategic initiatives.

6   Summary

6.1   Overall Assessment of Information Technology

Information technology that supports community-oriented policing is improving in the Tempe Police Department. IT development seems to be incremental, but senior staff have been aggressive in upgrading the CAD and RMS systems to improve the ability to perform ongoing analysis and problem solving. The current effort replacing the Motorola MDTs with new, "ruggedized" Panasonic MCTs and AFR is another gain. A new document imaging system will improve incident report storage. Planned improvements not specifically related to community policing include an automated fingerprint identification system (AFIS) and a digital mug shot system.

The Tempe Police Department implemented community policing and problem solving in 1988. COP/POP seems to be part of the department's philosophical and operational fabric, and the department can be described as being well beyond the "banner waving" stage of community-oriented policing. In some ways, the Tempe Police Department seems to be at a critical stage in that it is reassessing the emphasis placed on COP versus traditional police services. Perhaps this means that it has yet to find a way to fully integrate the two, if such integration is really possible.

6.2   Tempe Police Department's Best Practices

The Tempe Police Department's Web page, especially the crime analysis section and the variety of information provided, is a best practice supporting community interface. Citizens are able to locate their address within a beat and get current crime information for that beat. The various reports (notably those related to mobile home parks, apartment communities, and schools) produced by the Crime Analysis Unit are also best practices related to community interface.

The Tempe Police Department Crime Analysis Unit is a good example of how crime analysis can use CFS data and make it useful to beat officers. The unit conducts tactical analyses that identify crime trends in relatively small geographic areas. Trends are considered the beginning of crime hot spots. In addition to statistical information, the trend reports provide information on suspects and crime characteristics. Over 80 such trends were identified and disseminated by the Crime Analysis Unit in 1998. This appears to be a good way of translating basic police data into operational tactics and strategies. Interestingly, the software used in tactical analysis, Automated Tactical Analysis of Crime (ATAC), was developed by a former department crime analyst who is now a Tempe police officer.

The use of the Corona Solutions Staff Wizard for operational and administrative management is also a best practice. Studies that show time spent on calls for service and develop a real picture of how officer time is spent are important to management. The department is also looking at expanding the scope of this analysis in the near future.

Chapter **3**

Police Department

Information Systems Technology Enhancement Project

ISTEP

Case Study: San Diego, California

Contents

San Diego Highlights

The San Diego Police Department supports a department wide community policing philosophy and has been a pioneer in problem-solving. In these regards, the department is a model for many police agencies. San Diego defines their policing style as neighborhood policing. The dedication to this philosophy spans the administrations of at least three chiefs and is demonstrated in the department's strong relationship with other governmental agencies and neighborhood organizations. In recognition of their innovation, San Diego hosts the Problem-Oriented Policing Conference each year.

The department has also set a high standard for using technology to support problem solving. The Information Services Unit is housed in the Neighborhood Policing Division. This is an unusual organizational arrangement but it exemplifies San Diego's commitment to use technology to support problem-solving. The most recognizable example of software technology supporting community policing is the use of POP Track, a software program that helps officers solve identified problems using the SARA model. On a larger scale, the recent purchase and ongoing implementation of mobile computer terminals (MCT's) and automated field reporting (AFR) software enables officers to generate reports on their MCT's and send them electronically to supervisors and directly into the records management system. This process allows for quick dissemination of data and subsequent analysis to recognize recent trends or hot spots in the neighborhoods. The training provided for officers on the use of the MCT's and AFR is comprehensive and serves as a model to other cities considering the implementation of similar systems.

Crime analysis is the most recognized technical application in the San Diego Police Department that supports problem-solving for line level officers. Crime analysis staff are nationally recognized and frequently present workshops at conferences on the use of computerized mapping to support problem-solving. They also offer advice on methods of sharing police data with the community.

The San Diego Police Department's web site is among the best in the country, and displays up-to-date crime maps on each city neighborhood. San Diego has also invested significantly in an automated notification system used to send public safety messages to selected residences and businesses in a specific geographic area. The system interfaces with computerized mapping to help in identifying areas in which notifications are to be sent. Finally, SANDGIS (a citywide GIS management group) collects and makes available data from several city agencies for use on inter-organizational projects. The ability of the police department to perform subsequent analysis using several non-police data sets is instrumental in taking problem-solving to a new level in San Diego.

1 Purpose and Scope of Report

This case study is one of several produced for the Information Systems Technology Enhancement Project (ISTEP), a project funded by the Office of Community Oriented Policing Services. The aim of ISTEP is to increase the use of information and information technology in police departments, particularly regarding the implementation of community policing. The case studies document the current state of information technology and the use of information in five police departments: Tempe, Arizona; San Diego, California; Hartford, Connecticut; Reno, Nevada; and Charlotte-Mecklenburg, North Carolina. These case studies are based on a limited review of the status of information technology in the departments. A separate cross-site report synthesizes the findings of the individual case studies. A report on the project's conceptual framework presents the overall ISTEP approach and discusses how community policing demands different types of information systems, analysis methods, and uses of information than those required under the professional-era model of policing.

This report is based on four site visits to the San Diego Police Department. The first visit occurred on November 10, 1997. During this visit the core members of the Abt Associates ISTEP team met with the manager of the Technology Unit and Technology Unit staff members. This visit could be characterized as exploratory in nature, since it consisted of a meeting, a brief tour of the New Technologies Unit, and a demonstration of the terminals in patrol cars. This visit helped to shape both the questionnaire used to guide subsequent visits and this final report.

The second visit occurred February 6-9, 1998. It included interviews, demonstrations, and observations. In addition, a number of primary documents were provided to the Abt team. A key feature of this visit was observation of the bid presentation by the Sierra Group, which was chosen to develop the records management system (RMS).

The third visit took place August 9-11, 1998. The primary purpose of this visit was to conduct interviews with targeted individuals, interview individuals from the Neighborhood Policing Division, and conduct a ride-along. The fourth and final visit occurred October 27-29, 1998. This visit focused on interviews, observations of automated field reporting (AFR) training, and a ride-along. On each visit, an important goal was to obtain documentation. In San Diego this goal was met both with internal documentation provided to the research staff and the ability to download documentation from the San Diego Police Department website.

The organization of this case study document follows the overall conceptual framework for the ISTEP project. Accordingly, after providing background information on the police department in Section 2, particularly with respect to implementation of community policing, the case study describes current and planned information systems (Section 3), analysis methods (Section 4), and uses of information (Section 5). Section 6 summarizes our findings.

2   Police Department Background

2.1   Size, Overall Organization, Crime Levels, and Trends

The San Diego Police Department has a budgeted strength of 2,683 personnel, 2,038 of whom are sworn and 645 of whom are civilians. The total departmental annual budget is $206,669,345. Personnel expenses total $186,010,271, of which 77 percent is salaries and wages. The department's nonpersonnel expenses comprise the remainder of the budget, $20,659,074.

The department is organized into eight divisions: Field Operations, Special Operations, Neighborhood Policing, Training and Development, Office of Administration, Personnel Services, Professional Responsibility, and Support Services. All divisions are commanded by an assistant chief except Personnel Services, which is managed by a civilian personnel director.

Overall, crime in San Diego has been declining. The most recent year for which crime data are available is 1997. Fewer homicides were recorded in 1997 than in any year since 1978. Given the population growth over the last two decades, the homicide rate in 1997 was lower than in 1978; indeed, the murder rate of 6 per 100,000 in 1997 is lower than or equal to any homicide rate since 1972. The violent crime rate in 1997 was 819 per 100,000, lower than at any time since the mid-1980s. Property crime has shown a similar decline. The property crime rate of 4,115 crimes per 100,000 residents in 1997 is the lowest recorded since 1968; and some crimes, such as burglary, have also dropped significantly in the past 20 years.

This picture of substantial declines in crime rates over time does not mean that San Diego is now crime-free. The city still has crime rates equal to or higher than those for the United States as a whole. As in many cities, crime in San Diego has a spatial distribution in specific neighborhoods. That is, while many neighborhoods record little violent crime and low rates of property crime, some neighborhoods continue to be plagued by high rates of both crime types. These neighborhoods have exceptionally high levels of crime, rates that range from four to ten times higher than the citywide average.

2.2   Community-Oriented Policing Background

The San Diego Police Department has a strong commitment to community-oriented policing. In San Diego this commitment is defined as neighborhood policing. The commitment extends beyond the term of any individual police chief. Command rank can identify at least three chiefs who supported and implemented neighborhood policing. The commitment to neighborhood policing can be seen in a number of departmental activities. These include the departmental mission statement, which explicitly recognizes the role of community-oriented policing; the use and presentation of neighborhood-level crime data on the Internet; partnering with other city agencies; citizen police academies; training; implementation and emphasis on the four-step SARA model (scanning, analysis, response, and assessment); use of problem

solving for promotional purposes; and the integration of technology into problem-solving efforts.

San Diego is considered a national leader in problem-oriented policing (POP), and each year the San Diego department co-hosts the Problem Oriented Policing Conference with the Police Executive Research Forum (PERF). The conference is attended by law enforcement representatives from across the nation. Plenary and small-group sessions allow for the identification and discussion of problem-solving techniques, skills, and strategies. This conference has become one of the nation's largest conferences for line-level police officers.

Solicitation of Citizen Input

The San Diego Police Department engages in a variety of efforts to solicit citizen input, including the use of surveys, neighborhood meetings, and citizen police academies. A variety of other means of citizen input are supported through technology, such as the Communicator notification system, e-mail, and the departmental Web page. The police department also places a strong emphasis on partnerships. To this end, the department promotes problem solving that includes multiple agencies and commits the resources of non-law-enforcement groups.

Geographic Focus

The patrol methods used by the San Diego Police Department reflect a strong geographic focus. Policing occurs within neighborhoods, and officers understand and know the geographic boundaries of the neighborhoods. They also understand that individual neighborhoods have identifiable problems that do not necessarily exist in other areas. Geographically based policing in San Diego is supported by the use of geo-mapping by the Crime Analysis Unit. In addition, the Neighborhood Policing Unit helps to train and direct officers to maintain a strong neighborhood focus. This group serves as mentors to patrol officers and is available citywide to help officers develop POP projects and be more effective in neighborhood policing.

Adoption of Community-Oriented Policing Management Styles

Management styles encourage citizen participation, officer problem solving, and the use of data to assess problems. The involvement of command staff in beat meetings, up to and including the chief in some instances, is further evidence of the adaptation of management styles to support community policing. The regular meetings of the chief and assistant chiefs include a focus on community policing and problem solving. These meetings are often driven by data generated by the Crime Analysis Unit.

2.3   Community-Oriented Policing Training and Assessment

Recruits receive mandatory academy training in community-oriented policing, and beat officers are provided with in-service training in the philosophy. In addition, the department supports officers in seeking out additional training. There are numerous

in-service training opportunities, and officers with whom we spoke could identify specific training sessions of interest to them and spoke of general departmental support for engaging in such efforts. There are also a number of national opportunities, and the department is actively involved in PERF-sponsored activities as well as the U.S. Department of Justice, Office of Justice Programs Evaluation Conference.

Promotion practices reflect the departmental commitment to community-oriented policing. Promotions into supervisory positions are gained through a thorough understanding of neighborhood policing and the necessity to relay that understanding to subordinates. In addition, each officer who wishes to be promoted to sergeant is expected to take part in or complete a POP project or understand and support the problem-solving process.

3 Information Systems

3.1 Information Technology Staffing and Responsibility

Information Services is housed in the Neighborhood Policing Division, commanded by an assistant chief. This division consists of the Neighborhood Policing Unit; Sports, Training, Academics, and Recreation (STAR); the Police Institute; and Information Services. This is an unusual arrangement, since information services, technology, and data systems are typically located in a support division. The Area-wide Regional Justice Information System (ARJIS) and Records divisions are located under another assistant chief, who is in charge of Support Services in the department. However, the decision to co-locate Information Services and Neighborhood Policing reinforces the importance of problem solving and the corresponding need for information. The structure of the Neighborhood Policing Division is a direct result of the chief's commitment to community policing.

The Crime Analysis Unit, Data Systems, and New Technology are subdivisions of the Technolgy unit, each with its own supervisor. Currently Crime Analysis has 12 analysts, 6 funded by the city and 6 funded by grants. This unit is responsible for identifying problems in the city by analyzing data from calls for service, crime reports, and other related data sets. Problem analysis is completed by looking for patterns or trends in events by time of day, day of week, method of operation (MO), and suspect or victim characteristics. To improve the analysis of these data, mapping is used to amplify any spatial patterns in the specific problem being analyzed.

The New Technology Unit (NTU) is staffed by patrol officers who are knowledgeable about and committed to the integration of technology. This unit, headed by a sergeant, is in charge of preparing new laptops for installation by installing software, debugging them, and writing new programs where necessary. In addition, NTU conducts officer laptop and AFR training.

There has been consistent support from at least four chiefs for the development of information systems to support the problem-solving focus of the San Diego Police

Department. This emphasis reflects a long-standing commitment on the part of the department, and there is evidence of organizational change within the department to affirm the significance of information for effective policing.

3.2   Information Systems Related to Professional-Era Policing

Operations/Command and Control Systems

The San Diego Police Department is in the process of implementing laptop mobile computer terminals (MCTs) throughout the department. Panasonic computers were chosen over PC Mobile because the screens, batteries, and motherboards of PC Mobile often crashed and were problematic. PC Mobile was tested initially because it had an illuminated keyboard, which is a key feature. The Panasonic computers did not have an illuminated keyboard, making them the second choice. However, the San Diego Police Department found a mount that illuminates the keyboard, is easy to dock in and out of, and does not break the pins in the connection.

The use of AFR is a key aspect of the upgrade of the operations information systems. The link between AFR and the RMS will allow the department to more effectively manage information at all levels. Prior to the bid on the RMS, the San Diego Police Department used a paper-only system. The new RMS will allow for the automated transfer of incident information once an incident report is closed. The current RMS is incapable of supporting the demand for information expected to be generated by the department's use of laptop and AFR technology for problem solving. Currently, paper reports are filed, entered by hand in the Records Division, and uploaded into the system. This process is in transition as the RMS and AFR are being integrated into the department.

3.3   Information Systems Related to Community-Oriented Policing

Geographic Information Systems (GIS)

The department uses a standard set of mapping programs, ArcInfo and ArcView, to generate maps for neighborhood policing purposes. These maps are used in the Neighborhood Policing Unit to pinpoint interventions. In addition, maps are available on the department's website and can be accessed by citizens. Crime analysis has extensive mapping capabilities and produces a large number of diverse maps. For example, maps that locate homicide events by type of weapon and victim-offender relationship are displayed by Crime Analysis and used for neighborhood crime presentations and officer analysis.

Problem-Solving Information Systems

The department has been a leader in attempting to integrate problem-solving approaches into departmental activities. The department uses POP Track, a program that allows officers to enter data from problem-solving projects so that they and others can retrieve information such as the nature and location of the problem, steps in the SARA model that were employed, and the outcome of the intervention. As a result,

officers with similar problems, or with problems in similar locations, will know what has been done before and what effect the responses have had.

External Information Systems

The San Diego Data Processing Corporation (SDDPC) is the nonprofit agency charged with ensuring technology coordination, data systems, and data collection across San Diego. It coordinates these efforts for groups as diverse as public works, transportation, and law enforcement. The police department contributes some data to this effort. In addition, ARJIS is the areawide criminal justice data repository, from which officers can retrieve data on individuals who are held in jail, awaiting trial, or on bond.

The Communicator Notification System

The Communicator is an innovative piece of technology being integrated into the department in the fall of 1998. The Communicator, a product of Dialogic Communications, is an automated notification system used to send public safety messages to selected residences and businesses in a specific geographic area. The system interfaces with computerized mapping to help in identifying areas to which notifications will be sent.

The Communicator is a dynamic system that allows users to determine and define groups to whom "scenarios" can be sent via phone or fax. Static systems do not allow users to define subgroups for inclusion in different calling scenarios. In addition, the Communicator provides upgrades on a regular basis. The Communicator will work on a number of different levels and replace labor-intensive tasks that can be automated. In a sense, the Communicator is a relational database that can be queried to produce subgroups to receive messages or "scenarios." The Communicator can sort by location, job status, security level, task, rank, etc. In a city with many volunteer groups, such as San Diego (RSVP, the Reserve Senior Volunteer Patrol officers, block captains, business people, citizen's academy graduates, etc.), it appears that this will be a useful piece of technology. It is also very useful for emergencies. Notification of disasters, lost children, and even events like prowlers in a neighborhood are all seen as potential applications.

The mapping capability of the system is considerable. The system has a donut capability that allows users to define a different message for the inside ring of the donut than for the outside ring. This means that the message for a water main leak or a fire could be tailored to the resident's proximity to the event. Residents closest to the disaster would be given a call to evacuate, while those further away would be advised to stay in their homes and tune to the media or other public information sources for further information. The standard system comes with a phone book, user defined databases, and a standard ArcInfo map of city streets. San Diego is having all of its own mapping systems entered, including beat levels, city land use, and health districts. A large number of tasks that support community and problem-oriented policing can be completed with Communicator. There also are means to link the Communicator to POP Track.

3.4   Relationships and Experience with Vendors

The San Diego Police Department has chosen not to purchase an off-the-shelf product, but rather to treat technology as an ongoing development project. The department is responsible for substantial development activities, such as developing software and configuring hardware to meet local needs. This approach involves some risk; however, there is no existing package that meets the department's needs. As the manager of the Technology Unit stressed, there are two choices for the police department regarding software and hardware development for the records management system. The first is to purchase an off-the-shelf RMS that will not meet the needs of the department. The second choice is to take the risk associated with developing software and configuring hardware from scratch. There was consensus that the latter was the police department's only choice.

A representative of the city's Information Technology and Communications Division (ITC) has been especially concerned about the risks associated with the police department's decisions about how to proceed. ITC had an $11 million system that failed in the ARJIS project. However, the police department has never had a technology project fail and has confidence in their staff. The experience with Sierra, the vendor for the RMS, is instructive in this regard. The Request for Proposals (RFP) from the San Diego Police Department that led to the selection of Sierra was extensive and, according to members of the Sierra Group, the best they had ever seen. The relationship between Sierra and the police department was a partnership because the department had a clear idea of its needs, had the technical capability to articulate those needs in a specific manner, and sought a vendor that would work with the department rather than dictate to it. The RFP for the RMS was written internally by one of the department programmers and software experts.

4   Analysis Methods Used

4.1   Professional-Era Analysis Methods

Crime Analysis

On a structural level, the chief has expressed some concern about the utility of crime analysis in its present form. He wants more analysis of data – analysis that will lead officers more directly to intervention strategies and tactics. The chief has argued that the presentation of data can provoke further questions, but questions require more analysis to produce problem-solving interventions. The Sergeants Tactical Analysis Team report (STAT report) is viewed as a good example of this. The report includes top calls for service by division and by address. Crime Analysis and police leadership view this report as important and useful, but there is widespread recognition that the report is sorely underutilized. Indeed, it is recognized that many sergeants do not pay much attention to the STAT report. As a consequence, the chief is searching for ways to engage officers with the data.

Another initiative the police department is pursuing is to locate analysts in the division stations rather than in headquarters. The advantage of this structure is that it should

allow analysts to conduct more crime analysis for and with officers. Of course, there will be a loss in the learning that occurs among members of Crime Analysis, and the unit will lose some of the cohesive features of its organization. The trade-off, it is hoped, is that it will produce results that are more useful for officers in problem solving. This change reflects the recognition that more problem solving can be done with the data that is collected. Two additional elements are needed, however, to ensure that result: (1) a system of rewards for officers performing POP; and (2) problem-solving training using data and analysis. It is unclear who would provide such training.

A strong example of professional-era policing analysis is the Crime Analysis Unit's participation in a group convened by the owner of a chain of warehouse club shopping stores, storage facilities, and office supply stores. The owner identified, as a target for action, a mid-city neighborhood of approximately 100,000 residents where much of the violent crime in San Diego occurs. The owner offered the federal government a $500,000 match if they would put up an equal amount to invest in the neighborhood. The owner became frustrated with the pace of the government and decided to put up all of the money himself. The Crime Analysis Unit Manager has been meeting with the owner and his advisers, police department representatives, neighborhood representatives, and other advisers from such as PERF. The goal of the meetings to date have been to define possible interventions using Crime Analysis data.

The role of Crime Analysis in this effort is to design analytic packages that allow for problem solving of a broad nature. The goal of the project, and of the Crime Analysis unit, goes beyond simply responding to crime or calls for service. The goal is to provide road maps that will lead to broad-based problem-solving strategies and interventions. Thus, it is the job of the Crime Analysis Unit to design data systems and analysis presentations that represent the broad nature of problems. Information such as health, land use, commercial decline, and street use will be collected. This can help the planning group to suggest, design, and implement effective solutions. The project is pushing the Crime Analysis Unit in a new direction.

The Crime Analysis Unit is integrally involved in the planning process for this project. They are not only using typical police data, but are integrating data from SANDGIS (a citywide GIS management group) and the San Diego Organizing Project, a broad-based group of community, civic, and business leaders. The meetings are following a two-stage process: (1) a thought process (planning) to suggest the appropriate questions to ask regarding direction, data needs, and data products, and to define the nature of the problem and suggest a series of steps; and (2) an interpretative process (implementation) that takes the materials and processes from stage one and translates them into action. The police will be integrally involved in this effort, and the chief has assigned it a high priority. The strong expectation within the police department is that this effort will lead to innovative policing strategies and tactics, as well as to the formation of coalitions between the police and business, civic, city agency, and neighborhood groups that do not exist at present in the envisioned form.

4.2   Community-Oriented Policing Analysis Methods

Community Analysis

The department has available standard demographic, census-like data, as well as the data available from ARJIS, SDDPC, and SANDGIS. It does not appear that overlays with crime and demographic data are fully utilized within the current system and operation. This is an area to explore for the future. The ability of analysts and officers to analyze data sets correlated with crime and call-for-service data is a strong argument for expanding this practice. The project discussed in the previous section will be an interesting endeavor and should use some of these analysis methods, including health, city planning, and land use data, to develop a better understanding of why this neighborhood has higher crime rates and related problems than others.

Problem Analysis

As noted previously, problem analysis is largely done using POP Track software and through the work of crime analysts. Crime analysts have become increasingly involved in problem analysis, primarily because of their computer and analysis skills. If there is an area where problem-solving policing in San Diego appears to lag, it is in the analysis and assessment phases of the SARA model. This may be the most difficult aspect for which to train officers and ensure their completion of the tasks.

5   Use of Information

The ISTEP conceptual framework identifies seven information domains that are critical to the successful implementation of community policing. The seven are community interface, inter-organizational linkages, work-group facilitation, environmental scanning, problem orientation, area accountability, and strategic management. In each of these domains, information technology can, if properly applied, greatly enhance the effectiveness of community policing.

Each of the five police departments that ISTEP staff have visited excels in one or more of the seven domains. The following discussion details San Diego's participation in the seven information domains.

5.1   Community Interface

Community policing requires extensive collection and sharing of information. San Diego has made that information available to officers and more recently to the community through their website. The department has a home page that provides monthly pin maps showing selected crimes. Daily maps will be available shortly. E-mails from citizens on a standardized form to request services are received and forwarded to Crime Analysis. Officers will soon be able to receive e-mail directly from citizens.

Captains will also receive e-mail. Every area station will have a home page as well. The department has technologies to help officers prepare for their meetings with the community boards and groups. Community service centers also have LAN access and computers so citizens can access city services. A grant with the San Diego Organizing Project will provide computers and information to community groups so they will have the ability to download information to help them in managing projects.

5.2   Inter-Organizational Linkages

The interest in non-crime data has emerged only recently. Health issues are increasingly seen as important. The chief and assistant chiefs met with the health department recently to discuss health service delivery, customer relations, and other matters.

Mapping of land use and car theft correlation patterns and parolee and robbery correlation patterns are two additional examples of inter-organizational linkages of information. In addition, meetings between parole officers and detectives occur on a regular basis. These are more useful than maps alone, because of the interactive nature of information exchanged. Parole information is available on ARJIS as well as through the parole leads system. The city attorney and State's attorney are on the same network as the police department.

At this point, the level of use of police department data by other agencies is difficult to determine. For the most part, the police department is more of a consumer than a provider of information for other city departments. If other city departments need information that is not available on the department's home page, however, they can call and ask for it specifically.

5.3   Work-Group Facilitation

The department has a team approach that requires joint action and shared responsibility among officers. With a 4/10 work schedule (4 days/week, 10 hours/day), the overlap is critical for information sharing. There is the sense that roll call may not be used very effectively for this purpose. Beat books also exist for the purpose of information sharing. The cruiser is probably the best platform for communicating this information, particularly as all officers receive laptops and have their information updated upon log-on.

Detectives are now going to roll calls to take advantage of available information. Many detective functions already have been decentralized in San Diego and this trend will likely continue. As a result of this new strategy, work-group facilitation will be more effective and focused. It is clear that technology creates new needs for management and intra-organizational relationships.

5.4   Environmental Scanning

Environmental scanning in San Diego involves a management function closely related to community interface, including meeting with other police and non-police professionals and summarizing and providing related aggregate data for management-level

personnel. It also includes scanning the profession and being active in professional organizations. Bringing researchers into the department, attending conferences, and hosting the annual POP conference are also strong examples of scanning.

Information about changes in land use as well as the beat officers' need for information are additional examples of scanning. A tool for sorting information would be useful for most management personnel. Information overload already exists, and management is searching for a way to sort through the large volume of available data, both to catalog it and to determine what is useful and of acceptable quality.

Environmental scanning is used extensively in crime prevention through environmental design (CPTED) in San Diego to complement the department's problem-solving efforts. These efforts include individual problem solving by officers as well as broader initiatives that involve a division, beat, or cross-agency cooperation. The SANDGIS, SDDPC, and ARJIC data are used in part to accomplish this, but Crime Analysis is the primary engine that drives this effort. The Sol Price project should involve CPTED extensively in identifying why crime is occurring in this specific neighborhood.

5.5 Problem Orientation

Although the problem-solving focus of neighborhood policing in San Diego is clearly evident, the POP Track database is underutilized. A large number of paper POP files were opened but not used or not completed. There is uncertainty about whether training or officer rewards will change officer behavior and orientation toward using the POP database.

Clearly, performing assessment is the weakest of the four SARA components in San Diego. There is a large amount of scanning information, but little consistency in assessment. The assessments are not very sophisticated, perhaps indicating the need for organizational development or training in this area. The crime analyst will complete the project, including assessment, if the officer initiates the queries for more data and pushes for the next step. However, there is too little closure of POP files or cases. There is a move to address this weakness by decentralizing crime analysis and moving crime analysts permanently to patrol division stations. This move will allow crime analysts to help officers through the entire SARA process.

5.6 Area Accountability

Area accountability is largely accomplished through beat responsibility. As officers are responsible for beats, captains are responsible for areas. The strategic plan is to be the mechanism to produce this change. Geographic information systems will be a key component in accomplishing this. It is critical, however, that officers buy into the value of such information beyond its use at community meetings and political events such as the city council.

5.7   Strategic Management

Senior staff have access to data and technology to assist in making management and organizational decisions. Interestingly, the assistant chiefs did not get computers until February of 1998. The late addition of technology for management suggests that it may not be viewed as a high priority by senior staff or that management is late in embracing the use of technology.

A computerized patrol assignment plan is being updated to reflect community-policing principles. Senior staff members argue that the issues are not any different for command personnel; they simply aggregate differently for most management issues than for patrol issues. Community policing has forced some rethinking of staffing levels and caused police to think strategically as an organization. Stated schematically, community policing has prompted strategic planning, which in turn has led to greater accountability and individual responsibility, particularly for captains. The extent to which these concerns have penetrated higher levels of the organization remains an open question.

5.8   Other Uses

Use by Officers, Detectives, Management

To date, officers have not been allowed to take computers home from work. However, the recent COPS MORE grant will enable them to do so. The department hopes that this practice will lead to more computer use by officers for job-related purposes. The emphasis on problem solving by line officers means that line officers will get laptops and training first. Management is last in line for equipment and training. While all of the assistant chiefs have computers on their desks, several professed to have little acumen with them. Management will have to struggle to keep up with line-level staff in the use of technology.

Use by Others

The availability of crime data in a variety of forms means that citizens with sufficient motivation and skill may "push" the department in the future. The department maintains on its website an extensive amount of specific location and monthly data regarding crime. It would not be unreasonable to expect that some citizen groups would use crime and arrest data to argue for a redistribution of city resources, including law enforcement. This issue bears watching in the future, particularly the department's response to outside suggestions for improvement or change in problem identification and problem-solving steps.

6   Summary

6.1   Overall Assessment of Information Technology

The San Diego Police Department has a variety of key pieces in place to make information technology successful in supporting community-oriented policing. First, there

is strong support for community- and problem-oriented policing within the city. This support spans the terms of more than one chief and is well understood throughout the ranks. Second, the department has a strong cadre of insiders who understand hardware and software in addition to the needs of officers on the street. The AFR project is probably the best example of this. Third, the department has decided to make the transition from paper to technology through full-scale paperless automation. Fourth, the department is located in a city that has a strong commitment to technology and access to data for decision making. And last, the department has a strong reputation in the community and in the profession as an innovator. The downside to this is the extent to which an organization of 2,000-plus employees shares a vision of technology and how it should be used. It is unclear at this time the extent to which officers share the commitment to problem solving and technology that exists at top command ranks.

6.2 San Diego Police Department's Best Practices

There are several best practices from the San Diego Police Department. The most important of these is in the area of training. The Northeast area was involved in a pilot laptop training project 18 months ago. Ninety-nine percent of their reports are now submitted via the AFR, and Northeast officers appear to have accepted this practice. Officers complained when their computers were pulled back because they did not want to be without them. Training in the remaining districts is nearly completed.

Training takes place at the academy over two days, 10 hours per day, in two shifts per day. This schedule is followed to accommodate both day and evening officer assignments. A team of five officers does the training, and the classroom holds 20 students, each of whom has a terminal. The classes are set up in four rows of five seats, with one teacher assigned to each row. The entire class moves at the pace of the slowest student. By the end of the training, each student has submitted an arrest report and has completed a minimum of four real-world exercises. It should be noted that the involvement of sworn officers in software development and training greatly enhances the viability of the training and future implementation of that training.

Another area of best practices is community interface. The San Diego Police Department makes a substantial effort to involve the community in problem solving, and does so through a number of innovative means that involve information technology. The website is a good example of this. It allows citizens to obtain recent crime information in a location-specific context. The use of community service centers to provide access to these data is also important.

The SANDGIS is a best practice worthy of emulating in other jurisdictions. The ability to merge and call on a variety of social, physical, and behavioral indicators in a geocoded format enhances work-group facilitation and commitment to problem solving. By enhancing the collection of data and mapping in a coordinated way, SANDGIS enables a number of innovative, cross-department efforts to understand and address problems.

Chapter **4**

Police Department

Information Systems Technology Enhancement Project

ISTEP

Case Study: Hartford, Connecticut

Contents

Hartford Highlights

Community policing has been a part of the Hartford Police Department's (HPD) overall strategy since 1988, when the Community Service Officer (CSO) Unit was formed. CSOs meet regularly with residents and business people to discuss crime problems, work with blockwatch and other citizen groups, and facilitate communication between residents and city government. Over the past four years, community policing has been advanced in a number of ways. The department has aggressively sought out partnerships with other agencies such as schools, youth organizations, and other criminal justice agencies. They have increased their neighborhood focus and further decentralized the department around three Police Service Areas (PSAs). They have also instituted weekly COMPSTAT (computerized statistics) meetings, which aim to both increase accountability among area supervisors and foster improved communications between commanders in the three PSAs. Finally, in conjunction with Hartford's new Community Court, there has been a renewed emphasis on quality of life issues and problem-solving within the police department.

The key unit within HPD responsible for information technology – including system operation, maintenance, and development – is the Systems Services Division, which is currently staffed with six civilians. Unlike the vast majority of medium to large sized police departments in the country, the Hartford Police Department has not purchased their main information systems – computer-aided dispatch, case incident reporting, and booking – from outside vendors. Initial versions of these systems were developed by Systems Services Division personnel over a ten year period from the late 1970s to the late 1980s. Many HPD staff view the department's non-reliance on outside vendors as a major advantage, as Systems Services Division staff have been able to customize their systems and add new features as desired.

The police department has substantial experience with two technologies particularly important for community policing – geographic information systems (GIS) and external information systems. They have had a GIS capability since the early 1990s, when the department participated in the National Institute of Justice's Drug Market Analysis Program. Today, computerized maps are an important information support tool for Hartford's COMPSTAT process. In particular, a project funded by an Advancing Community Policing grant from the COPS Office is underway to develop an interactive map-based query tool that will be used during the COMPSTAT meetings.

Perhaps the most unique information technology-related feature of the department is their method of sharing information with community-based crime prevention organizations. With funding from the National Institute of Justice, systems and procedures were developed that provide Hartford community organizations with access to over two years of incident-level crime, arrest, and call-for-service data. The organizations can view and analyze this information using custom crime mapping and analysis software, which is installed in 15 community organization offices throughout the city.

1   Purpose and Scope of Report

This case study is one of several produced for the Information Systems Technology Enhancement Project (ISTEP), a project funded by the Office of Community Oriented Policing Services (COPS). The aim of ISTEP is to increase the use of information and information technology in police departments, particularly regarding the implementation of community policing. The case studies document the current state of information technology and the use of information in five police departments: Tempe, Arizona; San Diego, California; Hartford, Connecticut; Reno, Nevada; and Charlotte-Mecklenburg, North Carolina. These case studies are based on a limited review of the status of information technology in the departments. A separate cross-site report synthesizes the findings of the individual case studies. A report on the project's conceptual framework presents the overall ISTEP approach and discusses how community policing demands different types of information systems, analysis methods, and uses of information than those required under the traditional model of policing.

For this Hartford case study, ISTEP staff conducted interviews with the police chief, information technology supervisors and staff, and other command staff and officers throughout the department. ISTEP staff also reviewed internal police department documentation and published reports related to information technology.

The organization of this case study document follows the overall conceptual framework for the ISTEP project. Accordingly, after providing background information on the police department in Section 2, particularly with respect to implementation of community policing, the case study describes current and planned information systems (Section 3), analysis methods (Section 4), and uses of information (Section 5). Section 6 summarizes our findings.

2   Police Department Background

2.1   Size, Overall Organization, Crime Levels, and Trends

The city of Hartford, located midway between New York and Boston, is the urban hub of Connecticut's Capital Region. Although it serves as the region's major employment, service, government, and cultural center, Hartford covers only 18.2 square miles and has a population of roughly 140,000, making it one of the country's smallest urban areas. Approximately 250,000 to 300,000 people, about twice the population of Hartford, enter the city for some portion of the day for employment, entertainment, or other reasons. Destinations include the headquarters of a number of large insurance companies, including Aetna and Travelers, which are located in Hartford.

The city of Hartford contrasts sharply with the surrounding towns, which are primarily suburban communities with middle- to upper-income populations. Although Connecticut has the country's highest State per capita income, Hartford has for a number of years been one of the nation's poorest cities in terms of the percentage of residents living below poverty level. By 1998, however, city leaders saw signs that the city's long economic decline was ending, fueled in part by the planned move of the New England Patriots football team from Massachusetts to Hartford.

Hartford is divided into 17 neighborhoods, all of which have well-established identities in the city (i.e., a typical resident will know in which neighborhood she or he lives). Reports and statistics produced by the police department and other city agencies are typically organized by neighborhood. Most neighborhoods have had for a number of years one or more grassroots community organizations that focus either on community organizing or on providing services to neighborhood residents.

The Hartford Police Department (HPD) is commanded by a police chief who reports directly to the city manager. Two assistant chiefs command, respectively, Operations and Operations Support. There are three deputy chiefs, with each having overall responsibility for one of the three Police Service Areas (PSAs) in the city. Geographic responsibility, as opposed to shift responsibility, was instituted in the early 1990s. Each of the three PSAs has a distinct identity: the South PSA is largely Hispanic, the North PSA is largely African-American, and the Central PSA encompasses the downtown business district with a high population during business hours and a low population during nonbusiness hours. Overall, the department has approximately 475 sworn officers, down from approximately 500 in the late 1980s and early 1990s.

Throughout the 1990s, Hartford participated in a number of U.S. Department of Justice-funded programs, beginning, in 1990, with the Drug Market Analysis Program funded by the National Institute of Justice. In 1995, Hartford became a Weed and Seed site, focusing its efforts on the Stowe Village public housing development in the North PSA. Also in 1995, Hartford became one of 12 cities awarded funding from the Bureau of Justice Assistance under the Comprehensive Communities Program. The HPD has also received significant funding from the COPS Office, including funding for the Universal Hiring Program and COPS AHEAD.

In terms of crime, Hartford, like many urban cities in the country, experienced a significant decrease in serious crime in the 1990s. For example, from 1987 until 1992, the city had between 20,000 and 22,000 Part I crimes per year. Since then, the number has decreased significantly each year and, by 1997, the city had only slightly more than 12,000 Part I crimes. Hartford's Part I crime rate, however, is still nearly twice the national average.

All Part I and II crime has decreased recently, although only at about half the rate of Part I crimes alone: from 1993 to 1997, the number of Part I and II crimes decreased by 19 percent, compared with a 36 percent drop in Part I crime over that time period.

2.2 Community-Oriented Policing Background

Calls to implement community policing have been heard in Hartford since the mid to late 1980s, when a massive increase in drug use and the appearance for the first time of open-air drug markets completely changed the drug picture in Hartford. In response to this problem, a Mayor's Commission on Crime was formed in 1987. The Commission's recommendations emphasized that the police, the community, and other city agencies must work together to fight drugs and crime.

In 1988, formation of a new community service officer (CSO) unit in the department was one of the first steps toward implementing community policing. CSOs would not routinely respond to citizen calls for service, but instead would meet regularly with residents and business people to discuss crime problems, work with blockwatch and other citizen groups, conduct public education programs on crime prevention, and facilitate communication between residents and city government. The intent was that one CSO would be assigned to each of the 17 Hartford neighborhoods. Currently, there are 14 CSOs. Based on discussions with neighborhood residents and organizations, the CSO program appears to be quite popular with community residents.

In 1990, with funding support from the National Institute of Justice's Drug Market Analysis Program, Hartford implemented its first attempt at neighborhood revitalization that involved a community policing approach. The basic premise of this program was that street-level drug sales were a key factor in the declining quality of life in urban neighborhoods, and that the best approach to reversing this decay was the combined efforts of the police, the community, and city agencies. More specifically, the program employed a reclamation and stabilization approach. Thus, the police would reclaim a target area by employing a variety of high visibility and anti-drug tactics over a several month period. Once an area was reclaimed, the stabilization phase of the program would attempt to maintain the area in its reclaimed state over the long term through a partnership involving the community, the city, and the police. The program was implemented in four target areas from 1990 to 1992. Unfortunately, the effort, dubbed COMPASS, became largely a police-only project and had mixed short-term results. The COMPASS model, however, was later refined and successfully implemented in the Stowe Village public housing development under the city's Weed and Seed program. In addition, COMPASS introduced the HPD to geographic information systems (GIS) and crime mapping technology.

Following the end of COMPASS in 1992, the HPD introduced area accountability by dividing the city into three police service areas. Day-to-day responsibility for a PSA was given to a deputy chief. Soon after, the HPD received funding from the COPS Office to increase the number of officers devoted to community policing, and special community policing units were formed in each of the PSAs. Substations for each PSA were also built.

In 1995 the city attempted to expand community policing in the HPD with the help of a $2 million Comprehensive Communities Program (CCP) grant from the Bureau of Justice Assistance. In its CCP proposal, the city acknowledged that "Hartford does not yet have full department-wide community policing," with true community policing basically limited to the CSO unit. In an attempt to involve the community more in community policing, problem-solving committees were formed in each neighborhood. The city also hired an outside consultant to provide problem-solving training to the neighborhood problem-solving committees and to the HPD.

Since then, HPD officials point to four trends that underscore the department's commitment to community policing. First, the HPD has aggressively sought out partnerships with other agencies, such as schools, youth organizations, and other criminal

justice agencies. For example, the HPD was recently awarded a School-Based Partnership grant from the COPS Office. Second, the HPD has increased its neighborhood focus and further decentralized the department around its three PSAs: detectives and other specialized units are now assigned to a specific PSA; crime statistics are tracked on a neighborhood basis; and dispatching has been revamped to provide more of a neighborhood focus. Third, the HPD has instituted weekly COMPSTAT (computerized statistics) meetings, which are modeled after the New York City Police Department's process. The meetings not only attempt to hold supervisors accountable for crime conditions in their areas, but also foster improved communications between commanders in the three PSAs. Finally, within the HPD there is a renewed emphasis on quality of life issues and problem solving. Arresting officers now refer many cases to the city's new Community Court. In addition, sergeants are required to submit weekly memos to the PSA commander and the Assistant Chief of Operations that outline problems identified in their areas and steps to be taken to address the problems.

3　　Information Systems

3.1　　Information Technology Staffing and Responsibility

The key unit within the HPD responsible for information technology (IT), including system operation, maintenance, and development, is the Systems Services Division. Organizationally, Systems Services is directly under the Assistant Chief for Operations Support.

Beginning in the early 1970s, an HPD sworn officer headed the Systems Services Division. This officer oversaw development of all the HPD computer systems and was the key person in the department on technology issues. When he retired in 1995, his responsibilities were divided between the senior HPD civilian programmer, who would have responsibility for the computer systems, and a sergeant, who would have responsibility for the radio systems.

In addition to the senior civilian programmer, there are two other civilian programmers in Systems Services, as well as a civilian hardware specialist who configures new hardware and troubleshoots hardware and network connectivity problems in the department. All three of the programmers have been at the HPD for approximately 20 years.

For assistance in developing their 1998 COPS MORE funding request, the HPD (at the urging of the city manager's office) turned to an outside consultant, who conducted a series of group IT meetings with police and other city staff. The proposal requested $1.7 million for a comprehensive geographic information system and for major enhancements to the HPD's computer-aided dispatch, records, and booking systems.

3.2　　Historical Development of Information Systems

Initial versions of the major information systems in the HPD were developed in-house by HPD Systems Services personnel over a 10-year period from the late 1970s to the

late 1980s. Some modules were written for a now-retired Burroughs mainframe and subsequently ported to an IBM AS/400 mainframe, which is the HPD's current hardware platform for these systems. Other modules were written directly on the AS/400. Three HPD civilian programmers, who are still in the Systems Services Unit, developed these systems over this period, with each programmer taking primary responsibility for one of the three main systems – computer-aided dispatch, case incident reporting, and booking.

Since their initial development, the systems have been enhanced and modified in a number of ways. Currently, an effort is under way to restructure the system databases and make the systems year 2000 compliant.

Thus, unlike the vast majority of medium- to large-size police departments in the country, the HPD has not purchased its main information systems from outside vendors. According to department personnel, the decision to develop these systems in-house was based on the Systems Services commander's belief that he could build a system that was better than any vendor system. Today, many HPD staff interviewed for this project appear to view their nonreliance on outside vendors for the HPD's systems as a major advantage. Systems Services staff have been able to customize their systems and add new features as desired. On the other hand, the HPD is dependent on the three Systems Services programmers to maintain and enhance their major systems. For all practical purposes, they are the only persons who can perform these tasks on a timely basis. Some HPD commanders expressed concern over the dependence on the three programmers, while others felt that having civilian staff who are intimately familiar with the information systems was a huge advantage.

At the same time, the police department has operated and continues to operate their information systems without major assistance from the city's Information Services (IS) Department. Information Services either operates or maintains information systems for most other city agencies. On the other hand, IS purchases all computer equipment for the HPD. Thus, with the exception of purchases under State or Federal grants made directly to the HPD, the HPD cannot purchase their own equipment. This arrangement has been in effect since the mid-1990s.

3.3   Information Systems Related to Professional-Era Policing

Computer-aided dispatch (CAD) and a variety of records applications run on one of two HPD AS/400 mainframe computers. All of the applications are written in COBOL.

Computer-Aided Dispatch

The HPD dispatch center, located in the main HPD headquarters building, performs call-taking and dispatch functions for the HPD, as well as for Hartford's fire department and ambulance services. According to the HPD, approximately 350,000 dispatches of emergency resources are made annually. There are five call-taking workstations and six dispatch workstations in the dispatch center. While only two of the five call-taking positions are usually staffed at any given time, all six dispatch positions are typically staffed – two for fire dispatching, one for emergency medical services (EMS)

dispatching, two for police dispatching, and one for "info channel" requests. The person staffing the info channel position handles requests for information (e.g., warrant searches and name searches) from field units. There is also a supervisor position, from which all call-taking and dispatch operations can be monitored.

The HPD's computer-aided dispatch system – called HARTBEAT – has been used since 1988. As noted above, it was developed in-house, with the majority of the programming performed by the Systems Services senior programmer.

The CAD functions include all the features one would expect from a full-featured CAD system. For example, ANI/ALI modules automatically display on the call-taker's screen the phone number and address associated with incoming calls. A call-management function handles calls awaiting dispatch. The system provides dispatchers with a recommended unit to dispatch, based on configurable dispatch algorithms. According to dispatch personnel, the algorithms were updated within the past two years to give a higher priority to the police unit assigned to the area from which the call originated, with the hope that the units could develop more of an area identity – an important community policing objective. Specifically, the dispatch algorithm now suggests holding a low-priority call for service for as long as 45 minutes if the beat car is not available.

Dispatchers provide a basic level of information to police units that are dispatched to a call for service, including the address, type of call, and any other information provided by the caller. In addition, the dispatcher will relay any "responder alerts" associated with that address. These alerts, indicating some special condition at the address (e.g., a dangerous person lives at the address), can be entered by any dispatcher and will appear automatically on the dispatcher's screen when a future dispatch is made to that address. In addition, the CAD system automatically notifies the dispatcher if the address is one that has generated a large number of calls for service during the past year. Other information – such as whether persons with warrants live at the address or information about the most recent call for service at that address – must be retrieved by the dispatcher using a separate terminal to the in-house records system. Finally, while most patrol cars have laptop computers installed, dispatch information is not transmitted via the laptops; as discussed in Section 3.6, the laptops currently can only query National Crime Information Center (NCIC) and State-level vehicle and person files.

Dispatch personnel report that the system appears to be extremely reliable. One dispatch supervisor indicated that he knew of no instance in which the system completely "crashed" and call-takers and dispatchers had to resort to using the backup card system.

Records Applications

The HPD has a variety of police records applications. Most important is the case-incident reporting system (CIRS), which maintains information recorded on crime and other incident reports completed by officers. Currently, officers complete incident reports and submit copies to HPD records clerks, who enter a subset of the informa-

tion on the forms into CIRS. (As noted later in this section, in the future officers will enter their own reports using laptops.) Among the data elements not entered is the case narrative, a weakness in the current system noted by several officers and supervisors interviewed for this report. Approximately 65,000 records are entered in CIRS each year. As recently as two years ago, there was typically a two- to three-week backlog of incident reports to enter in CIRS. However, the HPD has managed to reduce that backlog to two to three days.

An adult booking system is used in the detention facility at police headquarters to help detention personnel establish the identity of new prisoners, enter identification information about the prisoner, enter arrest charges and related information, record bond and other release information, and prepare paperwork for the prisoner's appearance in court. Approximately 20,000 arrests are processed annually. The HPD recently purchased a live scan system for fingerprinting, but the system only takes the fingerprints and produces the fingerprint card. Eventually, the HPD hopes to upgrade this system so that fingerprint images can be stored and automatically transmitted to State and Federal automated fingerprint identification systems (AFIS). Booking officers use a separate terminal to the HPD's warrant system and the NCIC system to determine if the prisoner has outstanding warrants. Detention staff noted that their inability to identify prisoners based on fingerprints is not a serious problem, since other techniques based on the prisoner's name, nickname, scars, marks, and tattoos provide sufficient information to establish the prisoner's true identity in nearly all cases.

Other records applications in use at the HPD include systems for wants and warrants (in which approximately 6,000 entries are made annually), accidents, field interviews, parking tickets, vehicle towing, and nicknames.

3.4   Information Systems Related to Community-Oriented Policing

The HPD has substantial experience with geographic information systems and external information systems, as discussed below.

Geographic Information Systems (GIS)

Involvement with GIS stems from Hartford's participation in the National Institute of Justice's (NIJ's) Drug Market Analysis Program. In 1992, the HPD's research partner, ENFORTH Corporation of Cambridge, Massachusetts, developed a map-based "DMAP tool," which was a customized MapInfo application. The key user of the system was the HPD's Crime Suppression Unit, which at the time was the key police resource for the enforcement component of the DMAP program, called COMPASS. The tool allowed users to map a number of different types of police records, including the location of drug arrests, citizen complaints regarding drug activity, drug overdoses, and Part I crimes. Although this system fell into disuse within two or three years (in part because of staff turnover), the system introduced the HPD to crime-mapping technologies and led to the creation of a number of mapping-related enhancements to the HPD's main records systems (e.g., including geographic coordinates in the street segment file and the ability to assign latitude and longitudes to all calls for service, crimes, and arrests).

Since then, one of the HPD's three civilian programmers has continued to use MapInfo on a regular basis. He has also learned MapInfo's application development language, MapBasic. In the mid-1990s, the programmer wrote a MapBasic application that automates production of a series of weekly crime maps for distribution to the HPD command staff. The maps show the locations of various Part I crimes in each of the three Police Service Areas. More recently, these maps have been incorporated into the HPD's weekly COMPSTAT information packets.

In some respects, the HPD is well-positioned to further expand its use of GIS, in large part because of excellent systems and procedures for geocoding their records. First, all data entry systems have address verification procedures, which helps minimize the number of non-geocodable addresses. The systems also automatically associate an address with its neighborhood, census tract, and block, thus facilitating aggregate-type analyses. Most importantly, Systems Services staff have developed geocoding routines (which involved storing the geographic coordinates of the start and end point of each street segment in their geobase) in their AS/400 mainframe applications to assign latitude and longitudes to calls for service, crime, arrests, field interviews, and other police records. Thus, when records are downloaded to a PC for analysis, the records are already geocoded. HPD programmers are also experienced at downloading raw data to personal computers (PCs) for import into mapping programs.

External Information Systems

The HPD is currently participating in an NIJ-funded project that provides community organizations with unprecedented access to computerized police information. While all police departments share crime information with the public, in most instances what is provided is aggregate information, such as the number of crimes of different types that occurred in various sections of the city (e.g., neighborhoods). Some departments provide incident-level crime information, either over the Internet, in hard-copy format, or on a diskette. The HPD goes one step further by providing to the community both incident-level information (including calls for service, reported crime, and arrest data) and easy-to-use software that can produce different types of reports and maps from the data. Details of this system – dubbed the Neighborhood Problem Solving System, or NPS – are discussed in Section 5.

In addition to the NPS system, the HPD's Vice and Narcotics Division operates a confidential drug tip line, which residents can call to anonymously report drug activity. The tip line was instituted in the early 1990s as part of the HPD's NIJ-funded DMAP program.

Other Systems

While not ordinarily considered information systems that support community policing, properly configured and well-maintained basic office automation software, coupled with comprehensive and ongoing training, can save an officer or commander a significant amount of time, potentially increasing the amount of time available for community policing. A number of staff interviewed for this project commented on problems related to office automation software, including outdated software, the

shortage of PCs and printers, and the lack of training provided to staff. Some staff have resorted to purchasing their own computer equipment. In general, the quality of PC equipment throughout the HPD appears to vary widely, with only a minority of staff having up-to-date equipment. As noted previously, with the exception of grant monies from the State or Federal government, the HPD cannot directly purchase their own equipment. The City's Information Services (IS) Department procures computer equipment for the HPD. Thus, IS has the difficult job of prioritizing equipment purchases across various city agencies in a budgetary environment in which, no doubt, the demand for equipment far outstrips IS's equipment budget.

3.5   Relationships and Experience with Vendors

Because the HPD's main information systems have all been developed in-house, the HPD has significantly less experience with IT vendors than most medium- and large-size police departments. There have been instances over the past 10 years, however, when outside vendors developed IT systems for the HPD.

The HPD has used different resource-allocation software packages to help with patrol scheduling, beat design, and deployment strategies. In 1990, the HPD purchased the Hypercube software package from ENFORTH Corporation of Cambridge, Massachusetts, and used that package for three to four years. The Patrol/PLAN resource allocation package was used as recently as 1997. More recently, Abt Associates, also of Cambridge, developed the Neighborhood Problem Solving (NPS) system for use by community crime-prevention organizations in Hartford. The system enables users to create a variety of reports and maps based on call-for-service, crime, and arrest information. In addition, the HPD hired a vendor for their mobile computing project (see Section 3.6).

Reliance on outside IT vendors may increase in the future, especially if Systems Services programmer staffing levels are not increased. Systems Services supervisors would like to create an additional position, especially for a developer with Windows experience, since none of the current programmers have extensive Windows development experience.

3.6   Future Acquisition and Development Plans

This section highlights a few of the HPD's planned system development efforts.

Mobile Computing Project

Since 1998, the HPD Systems Services Division has overseen a mobile computing project, the goal of which is to equip HPD patrol cars with laptops that enable officers to do direct entry of police reports and to access a variety of information sources. An outside vendor was hired to do the software development work for this project. Systems Services Division staff will develop software interfaces, as necessary, between the mobile applications and HPD data systems.

The first phase of the four-phase project is nearing completion. Many, but not all, of the patrol cars have laptops, and training in the use of the laptops has been provided to staff. Thus far, the main features of the software installed on the laptops include NCIC and State-level person, vehicle, and gun queries, and the ability to retrieve digital mugshots. Patrol officers interviewed have reacted favorably to the laptops and appear to heavily use the vehicle query function. The response time to queries also appeared to be excellent. Maintenance of the systems is a concern, however, and a number of laptops have needed to be repaired because of liquids spilled on the keyboard and other reasons.

Future software modules in the system include incident report writing, development of a regional crime database (with 39 neighboring cities and towns), interfaces to the HPD's CAD and records systems, and mapping.

COMPSTAT Information System

In 1998, the HPD started weekly COMPSTAT meetings, which were modeled after the New York City Police Department's highly publicized COMPSTAT process. One project currently slated for development in 1999 is a prototype on-line information system to support these COMPSTAT meetings. Funding from a COPS Office Advancing Community Policing grant will support this work. The overall goal of the effort is to develop an information system that can be used during the COMPSTAT meetings to display police information on computerized maps. This system will supplement the current COMPSTAT handouts, which include a vast array of statistical and map-based information, by adding an interactive query element to the meetings.

As currently envisioned, the system, which will be usable by HPD staff with minimal computer training, will have a number of features. The most basic feature of the system will be the ability to display police data sets on a computerized street map. The data sets will include citizen-initiated calls for service, reported crimes, field interviews, and arrests. The system will also be able to display non-police data on a map. Users will have the ability to add layers such as neighborhood boundaries, public housing projects, schools, buffer zones (e.g., 1,500 feet) around schools, and other landmarks to the map display. Users will be able to control the display of police and non-police data sets on the map by "turning on" and "turning off" each layer. Users will also be able to easily focus the map ("zoom") on various map features, such as specified neighborhoods, landmarks, and addresses. For example, a user will be able to ask that the map display area encompass only an area within 100 feet of a specified address. Users will be able to specify the desired date and time range of the data to be mapped. Pre-specified date ranges such as "Last 28 Days" and "Last 7 Days" and pre-specified time ranges such as "8 AM to 4 PM" will be provided. Finally, users will be able to select map icons (e.g., an icon representing an arrest) and display in tabular form the information associated with that icon (e.g., the date, time, and address of the arrest).

This system will operate in the HPD's new COMPSTAT conference room, which will include systems for projecting computer output onto wall-mounted screens. If the prototype system produces the expected results, the HPD hopes to obtain additional

funding to extend the accessibility of the system to other HPD staff, beyond those attending the COMPSTAT meetings.

Database Redesign and Y2K

Systems Services Division programmers are currently working on modifications to the three major police information systems – computer-aided dispatch, case-incident reporting, and booking – that involve a redesign of the system's underlying databases. As part of this effort, the programmers will modify the systems, as necessary, so that they are year 2000 compliant. The primary weakness that these enhancements are attempting to overcome is that each of the major systems – including CAD, case-incident reporting, and booking – exists in a separate database. Thus, a name or address search of all the HPD's information systems requires individual searches in each of the major systems. When the redesign is completed, all the major systems will be linked, so that a single name or address query will search all the major information systems.

4 Analysis Methods Used

4.1 Professional-Era Analysis Methods

As noted in the previous section, the HPD has invested considerable resources in developing, operating, and maintaining their CAD and records systems. This section summarizes the extent to which computerized information is accessible to HPD staff. The discussion of access to information provides a useful context for a review of the analysis methods being used in the department.

HPD staff generally use one of four methods for accessing computerized information. The first method is terminal access to the HPD's AS/400 mainframes via the HPD's token ring network. Terminals are scattered throughout the headquarters building and are at a number of remote sites, including the PSA substations and the local FBI headquarters. At these terminals, staff can access the HPD master menu. From the choices on the master menu, screens can be displayed to allow queries against a number of different applications, including the criminal history system, the case-incident reporting system, the CAD system, wants and warrants, and field interviews. The search capabilities for these applications vary from searching just one or two fields (e.g., a name can be entered and queried) to searching any field in the database (e.g., the field interview system allows one to search any one or more fields). Common queries include retrieving criminal history records on a specified offender and retrieving information related to a specified crime or incident. The Crime Analysis Unit has a separate query menu, as discussed later in this section.

This terminal-based system is relatively easy to use and the query response time is good. The system could be improved in a number of ways, however. For example, the number of terminals is limited; there are only two for the entire patrol division – one for the patrol commanders and one for the patrol officers. Another problem with the current system configuration is that some terminals did not have printers attached to them. Also, a number of staff commented that they wished that the case-incident narratives were automated. Finally, a number of officers and supervisors noted that a sig-

nificant amount of training is necessary to enable staff to effectively use the terminals; for new recruits, this could be accomplished by including training in the use of this system at the HPD training academy.

A second method of access is relatively new but will be increasingly important over the coming years: access to computerized information from laptops in the police cruisers. As noted in Section 3, currently the laptops can query NCIC and Connecticut State criminal justice systems and retrieve digital mugshots.

Third, the output of some canned reports are routinely distributed to HPD staff. The most important of these reports is the weekly COMPSTAT report, which is distributed to attendees at the weekly COMPSTAT meeting, as well as to other HPD commanders. The reports are approximately 100 pages in length and consist of a variety of weekly, monthly, and yearly counts, pin maps, and lists. The HPD command staff view the COMPSTAT process as critical to their goal of increasing command staff accountability.

Finally, staff make requests for special reports. Requests appear to be made frequently by the senior command staff (e.g., for reports for discussion at a city council or community meeting), by investigative staff (e.g., for a list of active warrants in a particular neighborhood), by HPD staff preparing grant applications, and by the media. Requests for special reports go through the Crime Analysis Unit. If Crime Analysis staff are not able to fulfill the request themselves, the request is passed on to one of the programmers in Systems Services. Because these programmers designed and programmed the systems, they can respond to a wide variety of requests in a timely manner. For example, the programmers were able to tailor the COMPSTAT reports to specifications provided by the command staff. The response time to requests for information appears, in general, to be good, considering that the requests go through the channels described above. In fact, many command staff interviewed expressed complete satisfaction with respect to their information requests. Nevertheless, more complicated requests and requests from the media or the community must be prioritized against the programmers' system development and maintenance tasks. In addition, it appeared that some HPD staff were somewhat hesitant to request special reports, in part because they perceived that it was a burden on the Crime Analysis and Systems Services staff.

Crime Analysis

The HPD's Crime Analysis Unit consists of a sergeant and three officers. No civilian staff are in the unit. The crime analysis staff, who work at the main headquarters building, have all been assigned to this unit within the past two years. The analysts recently attended a conference of the International Crime Analysts Association to learn more about crime analysis and how other departments structure this unit.

Compared to other HPD staff, crime analysis staff have an expanded set of menu options for querying and running reports based on data residing on the AS/400s. Most of these menu options run canned reports that crime analysis staff use to prepare internal and external HPD reports, including Uniform Crime Reports (UCR), month-

ly Part I crime statistics, and public-housing-development crime reports. In addition, menu items exist for reports required by different Federal grants (e.g., arrest totals in the Stowe Village public housing development for the Weed and Seed project). Some reports are downloaded into a PC-based spreadsheet, where crime analysis staff reformat the data and compute various totals. In addition, crime analysis staff periodically prepare Crime Analysis Bulletins.

Crime analysis staff do not have access to raw police data. As a result, many requests for information from HPD staff that are funneled through the Crime Analysis Unit are in turn forwarded to the programmers in Systems Services. The ability to "slice and dice" raw data is required for more sophisticated types of crime analysis. For Hartford, providing crime analysis staff with raw data would require not only systems development work, but also technical training for crime analysis staff on how to manipulate raw data.

4.2   Community-Oriented Policing Analysis Methods

The types of analysis relevant to community policing – community analysis, problem analysis, program evaluation, and policy analysis – have been undertaken to a limited degree at the HPD. In most cases, they have been performed in conjunction with a Federal grant program that explicitly calls for this type of analysis. For example, Abt Associates recently completed an evaluation of Hartford's Weed and Seed program. The evaluation report included the results of neighborhood resident surveys and analyses of computerized police department data.

An initiative just beginning in the North PSA funded by the COPS School-Based Partnership program will expand community policing-based analysis methods at the HPD. Under this program, a problem-solving approach will be utilized to analyze crime problems at a school in the North PSA, to develop and implement solutions to the problem, and then to assess the impact of the actions taken. The specific problem under investigation is the safety of elementary school children while on their way to and from school. A recent Weed and Seed survey identified this problem as one of the most serious confronting school children. A partnership with a nearby middle school will be formed as part of this effort.

5   Use of Information

The ISTEP conceptual model identifies seven information domains that are critical to the successful implementation of community policing. The seven domains are community interface, inter-organizational linkages, work-group facilitation, environmental scanning, problem orientation, area accountability, and strategic management. In each of these domains, information technology can, if properly applied, greatly enhance the effectiveness of community policing.

Each of the five police departments that ISTEP staff have visited excels in one or more of the seven domains and, by design, the case study reports emphasize those particular domains. The HPD, as noted in Section 3, has a unique technology-based approach to sharing information with the community that presents a possible model for other

departments with respect to the community-interface information domain. Section 5.1 provides an overview of this approach, while Section 5.2 discusses the other six information domains.

5.1 Community Interface

Origin

The origin of Hartford's community interface is linked to the city's Comprehensive Communities Program (CCP). In 1994, Hartford became one of 12 cities to receive a CCP grant from the U.S. Justice Department's Bureau of Justice Assistance. According to Hartford's CCP proposal, the project sought to mobilize the community, to expand community-oriented policing by involving the entire department, and to develop community-oriented government. A key component of Hartford's strategy was the formation of problem-solving committees in each of the city's 17 neighborhoods. In many neighborhoods, the problem-solving committees consisted of residents who were already active in the existing neighborhood organization. In other neighborhoods, problem-solving committees represented entirely new structures in the neighborhood. The committees were charged with identifying and prioritizing neighborhood problems and, with the help of city agencies, implementing solutions to the problems. Large neighborhood-level meetings of residents and other stakeholders were held to select members of the problem-solving committees, many of whom were active participants in community organizations that existed prior to CCP.

CCP provided assistance to the problem-solving committees in a number of ways, two of which are particularly relevant to this report. First, the problem-solving committees were eligible to receive personal computers, including standard business productivity software and a laser printer. Many problem-solving committees immediately took advantage of this offer; others took over two years to acquire their computer. Second, CCP provided funds for an outside consultant to conduct problem-solving training courses for the problem-solving committees. The courses focused on recognizing problems, analyzing problems, developing strategies, implementing strategies, and assessing results. This same consultant provided problem-solving training to the HPD.

Information Needs Assessment

In conjunction with the problem-solving training, representatives of the problem-solving committees met with CCP, HPD, and Abt Associates staff to determine what types of information would be most useful for helping them do problem solving. A brainstorming session produced a long list of information that the problem-solving committee representatives felt would be useful. The list contained three general types of information needs:

- On-line discussion group information. Representatives expressed a desire for a mechanism that allows problem-solving committees to discuss neighborhood problems and solutions to those problems.

- Text information. Problem-solving committee representatives wanted access to a host of basic information sources, including:

  — Neighborhood resources
  — Telephone list of city agencies
  — City Council meetings and agendas
  — List of blockwatches
  — Apartment/property owner associations
  — City budget
  — City ordinances/codes
  — Problem-solving committee problems and solutions
  — City services directory
  — City policies
  — Zoning board agenda
  — School services
  — Parks and recreation services
  — Economic development activities
  — Church resources
  — Adult education information
  — Health Department services
  — Library information
  — Community group activities

- Database information. Problem-solving committee representatives indicated they wanted access to information stored in databases that could be tied to specific addresses. The list included:

  — Reported crimes
  — Arrest reports
  — Police calls for service
  — Anti-blight list
  — Demographic information
  — Property ownership information/tax records/foreclosures
  — Housing court records
  — Licensing and Inspection records
  — Standing complaints

To meet the first and second types of information needs, an Internet-based CCP network was established. Trinity College in Hartford provided e-mail accounts for the problem-solving committees and other CCP officials, provided space on their server for a CCP Web home page, and set up a CCP e-mail distribution list, or LISTSERV. The City also made Internet software available to the problem-solving committees.

With respect to information stored in databases, a subsequent meeting was held with representatives of the HPD, the problem-solving committees, CCP staff, Abt Associates staff, and representatives of the various city agencies to determine whether the desired

information was automated and, if so, whether the data were complete, accurate, and timely. Unfortunately, it was determined that, with the exception of police calls for service, crime, and arrest data, other information was either not automated or out of date by several months, although projects were under way to improve the quality of the data. By contrast, police calls for service and arrest records were entered in real-time (i.e., while the call-taker talked to the person calling 911 and while the offender was going through the arrest booking process), and reported crime information was typically automated about one week after the police officer submitted his or her completed crime report.

At about this time, the National Institute of Justice released a solicitation seeking proposals designed to support community policing technology. Specifically, NIJ sought to fund efforts designed to improve police-citizen cooperation and communication and increase police and citizen ability to solve community problems in an innovative manner. Abt Associates, with the support of the HPD and the Hartford CCP project, subsequently applied for funding to develop a Neighborhood Problem Solving (NPS) System that community organizations could use to help them with their problem solving. In light of the findings of information needs assessment, the proposal called for developing a system that would provide the problem-solving committees with access to police calls for service, crimes, and arrests. The proposal was eventually funded and work started in mid-1997.

System Development

Development of the system's functionality began with a survey of the problem-solving committees to determine what type of police information would be most useful, and what would be the most useful formats for presenting this information. Based on written survey responses and follow-up telephone conversations with respondents, it was clear that the respondents felt that the three types of computerized police data – calls for service, crimes, and arrests – were all potentially useful for problem solving. In addition, respondents expressed a desire to have five basic types of reports in the system: a detail list that shows in tabular form information about each event (i.e., calls for service, crimes, or arrests); a "top 10" list that shows the 10 most common types of events; an event trend list that compares the number of different types of events in two different time periods (e.g., year-to-date 1998 vs. year-to-date 1997); a time trend graph that shows the number of events by day, week, or month; and a map that shows the geographic location of events, with the size of the icon proportional to the number of events at that location.

In order to take advantage of the latest software development tools, Abt Associates staff decided to develop the Neighborhood Problem Solving System for the Windows 95 and NT operating systems. In terms of system software, an approach that emphasizes the use of pre-existing software "components" was employed. The specific tools that were used included Microsoft Visual FoxPro, Blue Marble Geographics GeoView LT OCX, and Microsoft Graph.

In terms of the overall design of the user interface, two main options were considered. The first "fill-out-the-form approach" involves presenting the user with a form, pre-

sumably on a single computer screen, that the user fills out according to the desired report. This approach was used in the initial version of the Chicago Police Department's ICAM system, a system used by Chicago police officers to produce maps and crime reports. The second approach – the "wizard" approach – involves a series of screens, each of which presents the user with a small number of options. The user goes from screen to screen selecting choices and then generates the desired report. Many commercial software programs use this approach for installing their software and for completing complex tasks. After discussions with users and with Abt Associates computer training staff, the wizard approach was selected. In retrospect, this approach worked well. Each time the system was demonstrated to potential users, they immediately felt that they could easily run the software.

One important difference between an analysis tool developed for internal police use and one developed for use by community groups involves the issue of what data to make available to the users. While much of the information a police department collects and maintains is "public" information and, technically, available to the public, police departments routinely withhold certain information from public view, such as information about ongoing investigations, juveniles, and victims. In addition, one frequently used method of partially withholding crime information is to publish the block where crimes occurred, rather than to the exact street address. HPD staff, in considering what information they would allow the problem-solving committees to access, also considered the difference between providing information in hard-copy format and providing it in an electronic database that can be easily queried and aggregated. The HPD decided that no identifying information on arrestees, suspects, or victims would be included in the system. The only person-specific information allowed would be the arrestee's age, race, and sex. The reason that identifying information was not provided on arrestees is that, in many of these cases, the charges will eventually be dismissed and, hence, the HPD did not want an arrest-based electronic database with identifying information to contain inaccurate criminal history information. Also, the specificity of the location information would vary, with the street number and street name provided for arrests, but only the block and street name provided for calls for service and crimes. On the other hand, geographic coordinates of the street number and street name are available for all three data types.

System Implementation

Programming of the NPS system began in November 1997 and a beta-test version was available for installation in Hartford in February 1998. This version was installed and tested by staff at the Blue Hills Civic Association in Hartford. Blue Hills staff made a number of recommendations and identified a few bugs. An additional round of software modifications were subsequently made, and the final version of the software was released in June 1998.

When the system was installed, Abt Associates staff provided users with hands-on training, a user manual, and the most recent 25 months of citizen-initiated calls for service, reported crimes, and arrests for their geographic area of concern. These areas range in size from a few city blocks to about two square miles. Data updates are provided every two weeks. When the updates are delivered, the data are approximately

10 days to 2 weeks old (e.g., a delivery of data on February 1st will contain all calls for service, crimes, and arrests through approximately January 20th).

The NPS software has been installed on 18 computers located throughout the city of Hartford, 15 of which are located either at community organization headquarters or at community policing substations (i.e., offices located outside of police headquarters that are used primarily by police community service officers). While technically the computers in these locations housing the NPS software are available for public use, the targeted users in this project have been staff and members of community organizations, rather than the general public. Having a targeted set of users distinguishes this project from one that installs an NPS-like system at public kiosks for the express purpose of providing information to the general public.

At each installation site, there are one or more targeted users – persons who have been trained in the use of the system, who receive and process the data updates, and whose use of and reaction to the system will be monitored over time. Typically, these targeted users show other persons at their organization how to use the system. In some cases, the targeted user is a full-time staff member of a community organization. Some organizations, for example, have full-time staff that are community organizers assigned to specific neighborhoods. In other organizations, the target users are members of the neighborhood problem-solving committee who have other full-time jobs.

The configuration in the Blue Hills neighborhood is unique. In that neighborhood, the NPS system is installed on the computer at the Blue Hills Civic Association, the main grassroots community organization in Blue Hills. This computer supports the work of the Civic Association. The NPS software is also installed at a local college, where students provide support to a group of eight Blue Hills blockwatch captains. The students use the NPS system to prepare a four-page handout that depicts crime conditions in all of Blue Hills and in six subareas of Blue Hills. Each blockwatch captain receives the handout every two weeks.

Across the problem-solving committees, the system has been used in a variety of ways and for a variety of purposes, with the following results:

- The overall reaction to the NPS system has been favorable. Users have praised the system's ease of use and believe that the system provides valuable information to community groups.

- The frequency of use of the NPS system varies widely across the users. Some organizations appear to use the system regularly, on a weekly or biweekly basis. Others use the system more sporadically, in response to the needs of special projects. Others, while they express a high degree of interest in the system, appear to use the system infrequently, if at all. This variation in use was expected and in many ways mirrors the frequency of use of mapping software in police departments.

- Of the five report types available to users (i.e., the detail list, the top 10 list, the event trend list, the time trend graph, and the pin map), the pin map appears to be the most widely used report type.

- Of the three data types available to users (i.e., calls for service, crimes, and arrests), there does not appear to be a preferred data type across the various organizations. Some organizations appear to be most interested in calls for service; others appear to be most interested in arrests.

- The reports that users produce from the NPS system have been used in a variety of settings, including internal community-group planning meetings, neighborhood-wide meetings, meetings with police officials, and blockwatch meetings.

- Those reports appear to serve a variety of purposes, including finding out information about crimes on a specific street, locating properties that have multiple arrests associated with them, encouraging residents to report more crime to the police, informing residents about specific crime problems, and determining what action the police have taken in response to information provided by community groups on hot spots.

5.2   Inter-Organizational Linkages

The HPD has worked closely with other government agencies on a number of projects, many of them funded through the U.S. Department of Justice. The best example is the city's Weed and Seed project, which started in January 1995 in the Stowe Village public housing development. The HPD is the grantee on this project. The HPD teamed with other agencies and organizations to implement a number of youth, social service, and employment programs in Stowe Village. A particularly successful partnership was established with the State Department of Social Services. DSS opened an office in Stowe Village in 1996 and has since worked with HPD and Hartford Housing Authority staff to help secure employment for a number of Stowe Village residents. The HPD has also worked closely with the Board of Education, in particular the administration of the elementary school that is adjacent to Stowe Village. This relationship will expand under a School-Based Partnership grant that the HPD recently received from the COPS Office, as noted in Section 2.

5.3   Work-Group Facilitation

In the HPD, work-group facilitation has occurred primarily at the command level, through the COMPSTAT process, rather than at the officer level. As noted earlier, all senior level commanders attend weekly COMPSTAT meetings to review crime statistics, existing problems, and ongoing problem-solving efforts in each of the three Police Service Areas. Less formal attempts are also under way to increase communications between other units.

5.4   Environmental Scanning

Recent attempts at environmental scanning have involved conducting residential sur-
veys. Examples include the surveys of youths living in Stowe Village, conducted for the
Weed and Seed project. The initial survey, conducted in 1996, identified the most
desired after-school and summertime activities. The results of this survey helped pri-
oritize which programs to fund under Weed and Seed during the subsequent year. The
youth survey conducted in 1997 asked youths to rate the seriousness of a number of
different problems. Harassment and threats received while walking to and from
school rated as the most serious problem for students at the school adjacent to Stowe
Village. As a result, this particular problem has become the focus of the HPD's School-
Based Partnership project.

5.5   Problem Orientation

As discussed in Section 2.2, the HPD believes that it has developed a problem-focused
orientation over the past three to four years through the use of the COMPSTAT
process, through increased decentralization, and through new procedures that
require weekly descriptions of problems and solutions in assigned areas. Within the
field police force, a problem orientation exists most forcefully within the Community
Service Officer (CSO) unit. CSOs assigned to neighborhoods work with residents and
community groups in the neighborhood to identify problems and craft solutions to
those problems. Recently, CSOs and neighborhood groups have utilized the
Neighborhood Problem Solving System, described in Section 5.1, to help identify and
prioritize problems. One technological approach to problem identification is a feature
in the HPD's CAD system that identifies the locations in the city that generate the most
calls for service. As noted in Section 3, the CAD system automatically notifies dis-
patchers when a call is generated from one of these locations.

5.6   Area Accountability

As noted earlier, each of the three HPD deputy chiefs has 24-hour-per-day operational
responsibility for one of the Police Service Areas in the city. Detectives and other spe-
cialized units are now assigned to a specific PSA. Accountability for these areas is
enforced through the COMPSTAT process. Also, as noted, the HPD's data systems are
structured so that area-specific reports can be easily created by the Systems Services
programmers.

5.7   Strategic Management

The department's overall goals, as well as a review of the previous year's performance,
are outlined in the HPD's Annual Report and its Community Policing Plan. As noted,
the current emphasis in the department at the senior command level is on the COMP-
STAT process, and on using that process to enforce accountability among the com-
mand staff. Another important related initiative is a new quality assurance audit pro-
gram designed to ensure that citizens are satisfied with the level of service they receive
from patrol officers responding to calls for service. Patrol commanders must conduct

audits of two randomly selected calls for service per tour. The HPD developed a questionnaire that commanders administer via telephone to persons requesting a police response.

6   Summary

This case study has been based on a limited review of the HPD's information systems and on how personnel throughout the department use the information in these systems. Based on this review, a number of recommendations can be made that can guide future development work and funding requests.

The first recommendation concerns the main HPD information systems, which are housed on the department's AS/400 mainframes and include the CAD system, the case-incident reporting system, and the booking system. Unlike most mid-size police departments, the HPD developed its own systems, rather than purchasing them from a vendor. The systems appear to be extremely reliable and, given that the original system developers are still on staff at the HPD, there are few, if any, technical obstacles to modifying and enhancing these systems. When they were developed in the 1980s, the systems were no doubt considered state-of-the-art. However, considering the lifetime of a typical police information system, the HPD's main data systems are old. While we do not recommend replacing or phasing out these systems, the HPD must take steps to preserve its significant investment in these systems. An obvious first step, and one that is already under way, is making these systems year 2000 compliant. A second step is to develop a plan to recruit, hire, and train additional computer programmers in the event that one or more of the current Systems Services programmers are no longer available. For all practical purposes, the current programmers are the only ones who can make major changes to the system or make minor changes in a timely manner.

Aside from maintaining the existing major information systems, the most urgent need is to increase the accessibility – and hopefully, as a result, the utilization – of information in the HPD's data systems. Specific recommendations for achieving this are as follows:

- Expand query capabilities on AS/400 terminals. There are terminals scattered throughout HPD headquarters and at the police substations that provide authorized staff with limited access to the main data systems. The HPD should place a high priority on expanding the query capabilities on these terminals. At a minimum, there should be field-based query capabilities – that is, the ability to search on any field or combination of fields on the screen – for all applications, most importantly the case incident reporting system, wants and warrants, and booking. Field-based querying is currently only available for the field interview application. The number and type of "canned" reports could also be increased. Expanding this base level of query capability will encourage all staff – from patrol officers to the senior command staff – to increase their use of the information in these systems.

- Provide the Crime Analysis Unit with the ability to analyze raw data. The Crime Analysis Unit currently does not have access to raw CAD and records data that could be manipulated with PC database or statistical software. Providing this type of access could be accomplished by performing a daily download of a multi-year data set (for trend analysis) or a two to three month data set (for operational or investigative purposes) from the AS/400 to a database (e.g., Microsoft Access) on a CAU PC. Given proper technical training and software tools, CAU staff could use the raw data to perform more sophisticated analyses, which could potentially impact resource deployment, ongoing investigations, crime prevention activities, and other operational decisions made by HPD commanders.

- Develop the COMPSTAT information system and consider expanding access to the system. Weekly COMPSTAT meetings are the HPD's primary mechanism for strategic planning and for ensuring command staff accountability. With a grant from the COPS office, the HPD is planning to fund development of a prototype map-based information system to support these meetings and supplement the 100-page COMPSTAT meeting packet. If HPD commanders react favorably to this new system, the HPD should consider making this system accessible to staff throughout the department on their desktop PCs.

- Ensure that the mobile computing project is fully funded. The HPD has embarked on an ambitious multi-year mobile computing project. Once the project is completed, patrol officers and other field units will have access to a vast array of computerized information from their patrol cars. It is critical that this project be fully funded.

For each of the systems, it is essential that funding be secured not only for equipment and development efforts, but also for adequate training and maintenance of hardware and software. Equally important is developing clear expectations for the sworn staff as to how the information access through these systems should be used.

A final recommendation concerns basic office automation capabilities at the HPD. Major improvements are needed in PC hardware, office automation software (especially word processing), and communications software (including e-mail and networking). For example, properly configured word processing software (e.g., with templates for all HPD forms and memos) and a timely and relevant computer training program would reduce time spent on paperwork and enable staff to commit more time to community policing. An e-mail system would ensure delivery of important messages (resulting in greater accountability for new orders), encourage communications between units within the HPD, and allow greater communication with the community and other city agencies, all of which are critical for effective community policing.

Chapter **5**

Police Department

Information Systems Technology Enhancement Project

ISTEP

Case Study: Reno, Nevada

Contents

Reno Highlights

The Reno, Nevada Police Department is committed to community and problem-oriented policing. The department has implemented a department-wide philosophy using patrol teams. Management invests heavily in problem-solving training for all officers including a mandatory 12 hours of academy training for new recruits. They have also developed a performance assessment and promotional system based on problem-solving accomplishments.

Technologically, the department supports their problem-solving approach by using POP Track, a software program designed to help officers track problems from initial identification through completion. POP Track enables Reno officers to work through the SARA model by recording information relative to each of the SARA steps. Also, officers have recently helped redesign their roll call room into a "smart briefing room". This innovation will make roll calls more conducive to discussion and information exchange by including a computer with mapping software and a state of the art projection system.

The Reno Police Department has admittedly struggled with computer-aided dispatch (CAD) and records technology performance during the last 15 years. However, the department has not succumbed to the information system difficulties and are well on their way to redesigning and planning new systems that will allow them to operate more effectively. Coupled with aggressive strategic planning, senior staff have made a commitment to take the department in a new direction. Information systems will no longer drive the department, but its problem-solving philosophy will drive information systems. They have backed up this commitment by initiating a planning process to develop new information systems including a records management system (RMS), CAD, crime analysis system, and jail management system (JMS).

As part of the technical portion of this strategic planning process, the department hired an outside consultant to serve as a liaison between the department and system vendors. This consultant has been successful in helping the department develop a request for proposals (RFP) for a new RMS and CAD. The department is now separating the RFP into two portions – design and implementation. The strategy will enable them to hold vendors accountable for on-time performance and quality of design. Also during this planning process, the department gathered significant input from end users, making specifications on necessary system outputs easily identifiable.

Through careful system development, officers and supervisors will be able to extract and analyze police data. In addition, integration with other local agencies will be the key to providing and gathering non-police data for more effective inter-organizational problem-solving. These plans demonstrate Reno's emphasis on making information system decisions a part of their policing and management strategy.

1   Purpose and Scope of Report

This case study is one of several produced for the Information Systems Technology Enhancement Project (ISTEP), a project funded by the Office of Community Oriented Policing Services (COPS). The aim of ISTEP is to increase the use of information and information technology in police departments, particularly regarding the implementation of community policing. The case studies document the current state of information technology and the use of information in five police departments: Tempe, Arizona; San Diego, California; Hartford, Connecticut; Reno, Nevada; and Charlotte-Mecklenburg, North Carolina. These case studies are based on a limited review of the status of information technology in the departments. A separate cross-site report synthesizes the findings of the individual case studies. A report on the project's conceptual framework presents the overall ISTEP approach and discusses how community policing demands different types of information systems, analysis methods, and uses of information than those required under the professional-era model of policing.

The Reno, Nevada, ISTEP case study is based on two site visits to the Reno Police Department. The ISTEP team conducted the first site visit on September 14-15, 1998, and conducted the second visit on November 30-December 1, 1998. During the site visits, interviews were conducted with the chief, the deputy chief in charge of the Planning, Training, and Research Division and directly responsible for the information system acquisition project, and the deputy chief in charge of the Community Affairs Division. Also interviewed were the department's crime analyst, training director, information services coordinator, mobile computer terminal (MCT) coordinator, a sergeant in the Training Division, and the City's Information Services Director. Group interviews were conducted with shift sergeants and the bike team. In addition, two ride-alongs were conducted and a problem-solving team meeting was observed. The site visits also included a demonstration of the recently acquired POP Track software for tracking problem-solving efforts in the department. The focus of these interviews and observations was to obtain an understanding of the current state of information technology and information use in the department, the community policing/problem-solving efforts, and how these operations are informed by current and anticipated information systems. Department reports and materials on problem solving and information technology were obtained during these visits.

The organization of this case study document follows the overall conceptual framework for the ISTEP project. Accordingly, after providing background information on the police department in Section 2, particularly with respect to implementation of community policing, the case study describes current and planned information systems (Section 3), analysis methods (Section 4), and uses of information (Section 5). Section 6 summarizes our findings.

2   Police Department Background

2.1   Size, Overall Organization, Crime Levels, and Trends

Reno is a growing community with a population approaching 180,000. The community's gaming and tourist industry attracts 50,000-60,000 tourists daily, and Reno's

large hotel facilities report an average occupancy rate of more than 90 percent. These characteristics present many unique law enforcement challenges for the Reno Police Department.

The Reno Police Department (RPD) has approximately 500 employees including 330 sworn officers, 128 of whom are assigned to the patrol division. The police department is organized into three districts, North, South, and Central. The North and South Districts are relatively large and include a mix of residential, industrial, and commercial properties. The Central District is geographically compact and includes Reno's principal hotel/casino district. A Deputy Chief commands each of these districts. There is a sergeant responsible for each district for each shift. All personnel operate out of headquarters, located in the Central District, although there are decentralized meeting facilities in the North and South Districts.

A unique aspect of Reno's patrol configuration resulted from a special tax levy for the downtown area. This tax provides an additional $840,000 to the department to provide increased police presence in this area dominated by casinos, hotels, and other businesses. This area is a 10- by 15-block area that is patrolled by 14 officers assigned to a bike team. The team works under the direction of a sergeant and operates out of the Central District. This unit was created with the goal of improving police visibility in the area. Although technically the unit is not responsible for answering calls, it does respond when it is feasible and officers are available. An active problem-solving approach dominates this team's patrol strategy.

In 1996 (the most recent year for which data are available from annual reports), there were 132,252 dispatched calls for service (362 per day on average). This represents a 25-percent increase since 1991. There were 10,881 Part I offenses reported in 1996, a 10-percent decrease since 1991; however, there was an increase in felony arrests of 23 percent during this same period (3,168 to 3,905). Larceny was the most frequently reported offense in 1996 (7,330), followed by burglary (1,676), vehicle larceny (725), robbery (507), assault (489), rape (114), arson (29), and homicide (13). Most of these offenses experienced moderate (7 to 9 percent) decreases since 1991, although rape decreased by 21 percent and robbery increased by 37 percent. Overall, these serious offenses declined by 7 percent over this period. Vehicle larceny in Reno, unlike many communities, was unchanged during this five-year period (Reno Police Department Annual Report, 1996-1997).

2.2   Community-Oriented Policing Background

The Reno Police Department has a strong commitment to community policing. Policing in Reno is based on a problem-solving strategy adapted from a similar approach taken by the San Diego Police Department. This strategy was first implemented in 1987, largely in response to deteriorating relationships with the community. At that time the department had experienced a significant reduction in resources and personnel, but they were also experiencing an increase in calls for service of 8 to 10 percent per year. Reno was also growing in square miles through annexation. A community survey administered in May 1987 indicated that only 49 percent of residents surveyed felt that the police department was doing a "good" job as an overall rating, and only 32 percent felt that the department had a "good" image.

In response to this situation, the department implemented its approach to community policing. From the beginning, significantly, Reno adopted a generalist approach emphasizing problem solving rather than the more popular and traditional specialized approach emphasizing community relations. There was never a specialized unit created to "do community policing"; rather, all officers were responsible for adopting this approach. Although choosing this approach has probably resulted in a slower implementation of these strategies, the department avoided the schism that many police agencies have experienced over what constituted "real police work." This has been a significant advantage for this department in implementing problem solving throughout the ranks. Although the department has had a problem-solving orientation for more than 10 years, it has only recently strongly emphasized this strategy.

As noted above, the department has a geographic focus on three districts throughout its organization. A team of officers is assigned for each shift that is responsible for all patrol operations. A sergeant directs the team and is responsible for making assignments. It is up to each sergeant to create time for officers to engage in problem solving. Problems are typically identified through officers' initiative and residents' comments and complaints. A potential impediment to stability in geographic assignment of officers is the bid structure that allows officers and sergeants to change shifts and districts every six months. It was reported that, as in many other departments, there is considerable movement of personnel due to this bid structure.

The sergeant is responsible for attending community meetings; patrol officers also attend these meetings but, due to shift schedules, there is some variation in who goes to the meetings. (This arrangement, again, reflects the commitment that all officers are to engage in these types of activities.) While all officers are involved in problem solving, it was noted that there is difficulty in communicating problem-solving activities across shifts.

Since the late 1980s, the city has had local neighborhood organizations known as neighborhood advisory groups (NAGs). These organizations met periodically with representatives of various city agencies including the police department. Recently, however, the city manager decided to disband this structure in favor of district-wide meetings. Although there is substantial opportunity for resident input to problem-solving activities, it appears that the police department initiates most such activity and solicits citizen participation. Problem-solving activities tend to involve community assistance and participation rather than initiation.

2.3   Community-Oriented Policing Training and Assessment

The Reno Police Department maintains a vigorous approach to training. Initial training in problem solving was conducted for all officers and supervisors by the Police Executive Research Forum (PERF) in 1987. Since then all officers have received additional basic and advanced problem-solving training. As noted previously, the department's approach to problem solving was modeled after that developed by San Diego. Representatives from Reno went to San Diego and received training and observed problem solving in action. These individuals then became the trainers for Reno.

Mission and value statements were created for the department that reflected the orientation of "Your Police, Our Community."

Several recent initiatives reflect the importance of problem solving in this department. In addition to routine, ongoing problem-solving training, enhanced training (12 hours) on problem solving is provided in the academy. More importantly, the department is in the midst of a major restructuring of the academy. The academy is operated by High Sierra Community College. A basic principle of this revision is that problem solving should be integrated into all aspects of training and not be simply a stand-alone module. Thus, problem-solving approaches and techniques will be integrated into more traditional academy topics.

In addition, the Field Training Officer (FTO) program has been lengthened from 16 to 26 weeks, and selected FTOs are officers who best reflect problem solving in their work. It was noted by one administrator that this selection criterion is a principal policy that can be used to address the organizational culture change that is necessary to fully implement this approach. In addition, the behavioral anchors for satisfactory performance have been revised to reflect a problem-solving orientation. The department also received a $300,000 COPS grant to design the next generation FTO program, which may potentially have broader, national-level implications.

Another important principle of training for the Reno Police Department is that the most effective training involves peer instruction. There are no "trainers" assigned to the training division; instead, most individuals conducting training come from the patrol ranks. There are common lesson plans to ensure consistent content of training, but it is delivered by a variety of officers and supervisors. The second major initiative is consistent with this philosophy. The department is currently implementing a problem-solving mentor training program. A contingent of officers recently went to San Diego and received problem-solving training on the mentoring concept. The principle behind this approach is that there will be a resource person available to assist other officers in problem-solving activities. Reno will be conducting two mentor training sessions over the next two months. Two individuals from each team will receive this training. Therefore, there should be an individual available for each team across all shifts who has participated in this training. This training will emphasize a hands-on approach and will consist of participants initiating a problem-solving project within the context of the class. Team sergeants are responsible for nominating those officers to receive this instruction. There has been a very high demand for these training slots. A similar approach was used in training 26 individuals on crime prevention through environmental design (CPTED) so that there would be a CPTED expert available for each team.

Part of the reason for the demand for this training may be that the department has revised its performance assessment and promotion procedures to reflect a problem-solving orientation. It was reported by the administration as well as patrol officers that it was understood that no one would advance in the department or receive "perks" (off-site travel for training or conference attendance) who does not actively engage in problem solving. As an example of this and the department's commitment to problem

solving, Reno sent 15 people to this year's POP conference who were high achievers in this regard.

The promotion system includes a revised assessment center that includes considerable material on problem solving. In addition, officers have to conduct a mock community meeting as part of this process. Officers interviewed reflected a great deal of enthusiasm about their participation in these activities and generally felt that these strategies were making a difference in public safety, the relationship with the community, and their own job satisfaction.

The exceptional commitment of the department to problem solving is also reflected in its vesting considerable responsibility in officers for the ownership of their projects. Patrol officers routinely give public presentations, even to the city council and the special tax district board, on the description and outcomes of problem-solving projects.

In summary, the Reno Police Department has a strong commitment to a community-oriented strategy through a problem-solving approach. While many agencies express a similar commitment to such an approach, Reno has made a number of operational and organizational changes to support these efforts. Although considerable progress has been made in the transition of this agency to a community-oriented approach, a number of concerns remain problematic, including the identification of problems, coordination of problem-solving activities across shifts, and the depth of problem solving in the organization. As discussed below, however, perhaps the greatest impediment to problem-solving efforts in the police department is the lack of information that is needed for these activities. It is clear that the provision of information for problem solving has not kept pace with the structural and operational changes that have been made by the department. However, exciting plans are being implemented that promise to address this critical deficiency.

3 Information Systems

3.1 Information Technology Staffing and Responsibility

Historically in Reno, the police department and other city agencies were responsible for the acquisition and maintenance of their own information systems and information technology. Although this structure had advantages for agency autonomy, it led to an extremely diverse information structure and, from the viewpoint of the city, one that was unworkable. Two years ago the city decided to adopt a more centralized structure and establish a city Information Services Division that would control information systems in all city agencies. A similar approach has been implemented in Tempe, Arizona.

In 1997, the city contracted with Deloitte and Touche for a review of their information systems and to produce a Systems Information Strategic Plan. This report indicated that the distributed information systems were not working as they should and that greater coordination was needed. From this review it was apparent that multiple directions were being taken across, as well as within, the various city agencies. For example, 19 different word processing programs were being used in these agencies.

New minimum standards were set for equipment. Personal computers are required to have a Pentium processor and 2-3 gigabyte (GB) hard drive. All software must run on an Oracle platform and be compatible with a Windows 95 environment.

The strategic plan called for a more consolidated effort and for adopting a philosophy in which data are treated as a strategic resource. Through this plan, information systems were to be integrated across departments and a structure was to be created to manage the implementation of technology.

Prior to the centralization of information services, each agency had its own "in-house expert" who typically had been with the agency for some time and had an aptitude for computers. Few had a background in applications programming or systems engineering. The implementation of this new plan called for these individuals to remain in their respective agencies but report to the city Information Services Division.

3.2 State of Information Systems

The Reno Police Department is attempting to make the transition from an organization driven by technology to an organization that is driving technology. The department is in the final stages of a five-year information technology plan to replace their computer-aided dispatch (CAD) system and to implement an information system (IS) that integrates their CAD, records management system (RMS), crime analysis (CA), and jail management systems (JMS). The goal is to have a system that enables the seamless transfer of data at the incident level. They plan to enter the implementation phase in January 1999. Since the planning process was implemented, the courts have acquired their own system, so the possibility of complete integration throughout the criminal justice system is problematic. The Technical Support Division commander is heading up the department's IS planning and implementation effort, and the approach will produce a very functional system since its design is being driven largely by end users. A department-wide computer committee plays a significant role in shaping the creation of the information systems.

The police department acquired its current records management system, known as PLIMS (Police Law Enforcement Information Management System), in 1986. It was acknowledged by all staff interviewed that some egregious errors were made in the acquisition of this system. Some felt that this system was obtained to meet records management and not operational needs. All agreed that this system just doesn't work. The consensus was that this system never lived up to the expectations created by the vendor, and a number of components never worked at all. A common complaint, as with the users of many systems of the same vintage, was that a lot of information is entered into the system, but police cannot get anything out of it. One individual described the entry of data from field interviews (FIs) into the system as "throwing them into a black hole." Others felt that there was a problem in entering data into the system. There is a lag of about four weeks in entering data into the system.

The system was designed and implemented in a piecemeal fashion. This approach was largely driven by available funding, but also by the lack of knowledge in the department about what they wanted and needed. It was common to have $100,000 contracts

with the vendor for "fixes" to the system. Across all interviewed, there was common criticism of the vendor of this system, and it was generally agreed that the department was victimized by the vendor. Senior staff also acknowledged that they were victimized by their own naivete in this field. This experience has produced a common resolve to do things right in the acquisition of their new system and not repeat the mistakes of the past.

The situation relative to the existing computer system has evolved into a crisis. The current system is out of space and memory. Further, the vendor has not upgraded the operating system in some time, as it is presently functioning on an operating system that is six versions behind the most current one. In addition, the current system is not year 2000 (Y2K) compliant. A transitional system has been ordered and will be installed in the near future to bridge computer operations to the installation of the new computer system.

From the perspective of the city Information Systems Manager, this situation developed largely because the computer systems were built in a piecemeal manner without a coordinated consideration of what is really needed. Problems or needs would be ignored until they reached a critical point. He attributed this to the use of nontechnical people to put together a technical solution.

Recognizing the condition of its data system, the Reno Police Department has included significant sections on information technology in its one- and five-year strategic plans. In 1994-95 the department started to develop a Request for Proposals (RFP) along with a five-year information technology plan to replace the existing system.

Other technology developments in the department include the replacement of Motorola mobile data terminals (MDTs) with 65 "ruggedized" Panasonic laptops equipped with CD ROMS, and the possible acquisition of a proprietary automated report-writing tool estimated to cost $150,000. Department personnel indicated that the MDTs had been inoperative for nearly a year due to an equipment problem in dispatch. Historically, the MDTs provided limited information to officers in cruisers such as wants and warrants, National Crime Information Center (NCIC), and auto theft information. At the present time, officers have little information on a call for service beyond what the radio dispatcher gives them. Therefore, communications with dispatch tends to be very conversational in nature, with limited use of MDTs to provide call information. The new Panasonic mobile computer terminals (MCTs) will provide in-car access to the report-writing tool, to information contained on the department's LAN – such as standard operating procedures, city ordinances, and Internet-based information – and to NCIC and State of Nevada motor vehicle databases.

3.3 Information Systems Related to Professional-Era Policing

In Reno, individual information systems and software packages have been implemented using off-the-shelf products to support professional-era policing. As noted,

the CAD and RMS technology that Reno acquired in 1986 has never fulfilled its promised performance. Individualized efforts require entry of incident report data, and the RMS is limited to very specific uses.

Overall, the flow of information, at least that generated by crime analysis and manipulation of the RMS, is multidirectional. Information flows down to line officers and supervisors and outward to the community. Although no specific mention was made of providing command staff with information, it is likely that information flows upward on both a regular (i.e., annual survey, annual department report) and an ad hoc basis (i.e., special requests).

3.4 Information Systems Related to Community-Oriented Policing

Geographic Information Systems (GIS)

Senior commanders and line officers understand the benefits of computerized mapping and geographic information systems. The department's GIS technology, however, is quite limited. Crime analysis produces some maps using MapInfo. The computer used to produce the maps is dated and has limited capacity and speed, which makes the production of maps a slow process. Furthermore, the data used in crime analysis is taken from hard copies of records data and then manually reentered into a database maintained by the crime analysis unit. At the present time it is not possible to transfer data directly from the CAD/RMS system to the crime analysis database. This time consuming and inefficient process limits the potential applications and utilization of GIS for problem solving.

Problem-Solving Information Systems

The department has recently implemented the POP Track software system for monitoring problem-solving projects and the progress made in these initiatives. Officers in conjunction with sergeants determine how a problem is defined and thus entered into the system. Officers and supervisors are then responsible for entering events and activities into the system so that information on specific responses and outcomes will be available.

The software is designed to take officers through the four-step SARA model (scanning, analysis, response, and assessment) in managing specific POP projects. The software takes problem solvers through an individual project form that identifies problem location, problem type, and officers or supervisors assigned to the project. This form also allows officers to enter narrative comments about the project. The SARA form takes officers through each phase of the process and allows them to enter information using check boxes and narrative comments for a particular problem. Projects can be updated or closed by supervisors and are of particular value in tracking POP over time.

External Information Systems

A particularly important low-tech mechanism for obtaining information on community perceptions of police performance is a community survey that is done by the department in conjunction with the Department of Criminal Justice at the University

of Nevada (Reno). This survey was initiated in 1987. At that time, the department was experiencing a deteriorating relationship with the community; and as it implemented steps to address this problem, the department desired an ongoing method to assess this relationship. The survey also seeks to ascertain the community's perceptions about specific problems and concerns that may be of importance for police operations. For several years this survey was conducted every six months, and it is now administered annually. The survey is conducted by telephone and explores traditional topics, such as assessment of police performance, perceptions of safety, and identification of problems and concerns. In addition, specific questions on substantive problems are periodically included. For example, the most recent survey had several items measuring the exposure to domestic violence. A sample size of 400-500 is included in each wave of the survey and respondents are randomly selected proportional to telephone prefix. Trained volunteers conduct the survey, and the department's crime analyst conducts the analysis with assistance from faculty at the University of Nevada. These measures serve to keep the cost of each wave of the survey at about $2,000.

3.5 Relationships and Experience with Vendors

Reno has considerable experience working with information technology vendors. In fact, their negative experience in the acquisition and operation of their current PLIMS system has given them resolve not to repeat the mistakes of the past. They felt that the system they acquired in 1986 never lived up to the promises of the vendor. There was considerable misunderstanding and miscommunication in this process, and there was a general feeling of being at the mercy of the vendor throughout the life of this system.

Based on this experience, the department knew, as it approached the replacement of the CAD and RMS systems, that it needed to be more proactive in this process. The department needed to determine its own needs and assure that the new contract would meet these needs. Given the lack of technical knowledge in the department (at the time the city Information Services Division did not exist), it was determined that in order to avoid the debacle that occurred previously, a consultant would be hired to manage the vendor, facilitate the design process, and act as a translator between the department and the vendor. The initial consulting team hired to perform these tasks was not as skilled as the department desired. While having this assistance was important, the lack of experience of this group hampered progress and, in the view of some, significantly increased the time to implementation.

About two years ago, a new consultant, Emmack Cronan Group Inc., was contracted to perform these tasks. At this point, substantial progress began to be made. This consultant had considerable experience in the criminal justice field and had worked previously with the contracted systems vendor (Tiburon). There was a strong consensus that this was one of the most important developments in the acquisition of a system that met the needs of the department. The consultant was able to help the department determine its needs and then determine if what the vendor proposed would really meet those needs.

Compared to its previous experiences, the department's experience with Tiburon has been much more positive. This does not mean it has been without problems and

issues, however. One important resolve of the department, again based upon previous experiences, was to break the tasks down into two contracts, one to support system design, and the other for system implementation. It was noted that vendors are quite resistant to this structure, preferring all tasks to be under one contract. This approach was viewed as important both as a cost containment measure and to provide incentives for the vendor to conclude the design phase as soon as possible.

3.6   Future Acquisition and Development Plans

These are exciting times for the Reno Police Department. Over the next several years a new CAD and RMS system will be implemented and integrated with vehicle laptops to form a state-of-the-art system that will support the department's problem-solving approach to policing. This will mark the culmination of a lengthy planning, design, and implementation process. The acquisition of this technology has been guided by a committee chaired by the Planning, Training, and Research Division commander. The committee developed the RFP that laid out the detailed specifications of what the new system was to do, the data elements to be included, and report capabilities. In September 1995 the draft RFP was completed. Only two vendors responded to the RFP, Intergraph and Tiburon, as most indicated that this was too big a task for them to undertake. The Emmack Cronan Group was contracted in 1996 and significant progress was made after that point.

It is important and instructive to note the process used to develop the system capabilities that were specified in the RFP. For the most part, the system was designed by the end users. Work groups were established in the department for various modules of the system according to various police operations. These groups were tasked with creating the ideal system through identifying specific information needs for problem solving, investigations, crime reporting, and other aspects of police operations within each major operational segment of the department. Several individuals noted that it was ironic that they probably benefited from the fact that their existing system was inadequate. This allowed them to start over and design a system that they really wanted rather than modify one that would likely not fill their needs even after these alterations were made.

Committee meetings with the consultant were held once a month for a 2-3 day period, and there would typically be another meeting of the work group or committee during the month. The process to develop the proposed system took much longer than anyone anticipated – at least two years – since all those involved already had full-time responsibilities that did not go away because they were involved in this system redesign effort.

The allocation for this task was $4.5 million and $400,000 was budgeted for the phase-one system design. As noted above, the work group designed an ideal system. It is unlikely that such a system can be obtained with the existing funds. Recently the vendor submitted a cost estimate for these changes from their standard system. The city of Reno will negotiate the actual cost of these changes with the assistance of the consultant. In addition, the department will set priorities on the various aspects of the

system and determine the components and capabilities of the initial implementation. It is anticipated that these modifications will happen soon. As noted previously, this system includes CAD, RMS, and jail management components. By agreement with the county, the jail management system will be the first system implemented. This agreed order will cause some delays in implementing the law enforcement component. The city Information Services Division manager indicated that he anticipated that the police component would not be operational until the middle of next year; however, others felt that it might be implemented sooner.

The new system will have specific components for crime analysis and mapping. Given that the design of the system was based upon how it could support problem solving, it is anticipated that many crime analysis and mapping functions can be routinized to the point where patrol officers with sufficient training can conduct analysis to support their problem-solving projects. In addition, the system will be National Incident Based Reporting System (NIBRS) compliant.

It is further anticipated that much of this analysis may be conducted from the new laptops that are currently being installed in patrol vehicles. The "ruggedized" laptops (Panasonic) have been acquired and are currently being installed. The department is exploring the acquisition of a mounting device with an articulated arm to facilitate positioning the computer for use in the vehicle. The department is also in the process of acquiring a report-writing tool that has been funded through a COPS MORE grant. It is anticipated that this will be operational in the next 12 months.

4   Analysis Methods Used

4.1   Professional-Era Analysis Methods

Crime Analysis

The department has one crime analyst who provides periodic, routine analytical reports and responds to special requests regarding specific topics. The crime analyst produces a weekly crime report that is transmitted to lieutenants. This report includes citywide crime totals by type, specific reporting-area crime totals, and incident-report records information on each of these crimes. In addition, a semiannual report on crime trends in each of the department's 26 reporting areas is produced and disseminated throughout the department and the community.

Information for the department's annual report is also prepared by Crime Analysis. The crime analyst completes special request analyses for officers, detectives, command staff, community members and organizations, and for other city agencies. It was estimated that about one-third to one-half of all officers request crime analysis information to assist problem-solving efforts. The crime analysis unit also tracks property in pawnshops and compares pawn serial numbers with National Crime Information Center (NCIC) data in an attempt to identify stolen property. In addition, the unit plays a role in maintaining gang intelligence and a gang-tracking database that is on the department's LAN.

The difficulty in retrieving data from the existing data system makes the crime analysis process quite difficult and cumbersome. There is also a considerable lag in data entry. Reports produced tend to be for routine historic periods; thus information is less available for operational purposes. In many instances, data are obtained from the RMS or CAD system and reentered into a specialized database using an off-the-shelf program, FoxPro. Some limited mapping of calls for service and crime data is done using MapInfo in this manner. However, the department has recently converted the mapping program from MapInfo to ArcInfo and, increasingly, can use other data sets (police and non-police) for analysis.

4.2   Community-Oriented Policing Analysis Methods

The limitations of the existing data system present considerable difficulties and obstacles in conducting analysis for problem solving. In fact, several individuals commented that this was one of the principal (if not the major) hindrances in their problem-solving efforts. Officers are eager to conduct the analysis required by the SARA process but are often unable to do so because of the limitations of the data system. Similarly, there is no repeat-call analysis capability, which many departments have used effectively in their problem-solving strategy. One of the principal analysis methods for community policing is the annual community survey that was previously discussed. In addition, officers routinely conduct surveys of smaller populations for input and analysis related to problem-solving efforts.

On a positive note, the new computer system was designed with analysis in mind. Data elements to be used directly for problem solving were included in the system redesign. It is anticipated that officers will be able to query the system to address questions for problem analysis and will be able to produce maps of the locations of reported crimes and calls for service.

5   Use of Information

The ISTEP conceptual framework identifies seven information domains that are critical to the successful implementation of community policing. The seven domains are community interface, inter-organizational linkages, work-group facilitation, environmental scanning, problem orientation, area accountability, and strategic management. In each of these domains, information technology can, if properly applied, greatly enhance the effectiveness of community policing.

Each of the five police departments that ISTEP staff have visited excels in one or more of the seven domains. The following discussion details Reno's participation in the seven information domains.

5.1   Community Interface

At present, Reno has not utilized technology extensively to enhance the community interface aspect of community-oriented policing. Perhaps the most significant current effort is a pager-based broadcast system that the department uses to immediately noti-

fy the media and other interested parties (e.g., casino security) of news items and related events. While text pagers were previously supplied by the department to access this system, it now requires users to pay a fee for participation.

The department provides each employee with an e-mail address. At this point, however, it appears that e-mail is used extensively for internal communication but is not used significantly externally for communication with the public. The use of e-mail externally is likely hampered by the fact that the department does not consistently provide business cards to patrol officers. Since there is no permanent assignment of officers to geographic areas, there may be less demand for such access than would otherwise be the case.

The department currently has a basic Web page. There are plans, however, to make it more informative and interactive so that it can enhance community interface. The city of Reno also has plans to implement information kiosks that would include access to police information. Recently, the department began a weekly public television program. The program covers a variety of topics using guest speakers and also allows residents to phone in during the show with questions and comments.

Although the department employs limited information technology to enhance community interface, it does have several significant ways in which community input and feedback about police operations are obtained. Principal among these mechanisms is the regular community survey discussed previously. This annual survey provides important information about the community's perception of the police department and assessment of its performance. In addition, it provides citizens' perceptions of the most pressing problem in the city and in their neighborhood. The department also regularly participates in neighborhood meetings, generates bilingual public service announcements, operates a community feedback telephone line, and has cell phones for commanders.

5.2   Inter-Organizational Linkages

The Reno Police Department is in an advantageous position to establish on-line linkages with other local law enforcement agencies and the jail, prosecutor, and the courts. Such linkages are facilitated by the fact that the police department serves as the call-taking and dispatching agency for other agencies in the county. However, the antiquated nature of the CAD system and the limited amount of data that can be gleaned from it without extensive difficulty presently limit the potential of this linkage. When the new CAD and RMS systems come on line, this hurdle should be overcome. In addition, through the implementation of this new system, the police and the sheriff's department will be using the same forms and information system. Further, the jail management system will be part of the same RMS and the police department will have access to jail information. The courts have expressed some reluctance to participate, but are expected to eventually come on board.

On-line linkages with other city agencies have historically been limited due to the decentralized approach to information systems that has been taken in Reno. Until recently, each city agency had considerable autonomy with regard to its information

system. With the establishment of the city's Information Services Department with authority over information technology development in city agencies, it is likely that there will be considerable inter-organizational linkages and information sharing in the future.

Two low-tech examples of information sharing through inter-organizational linkages are prevalent in Reno. One is the creation of the Problem Analysis Advisory Committee (PAAC), which is composed of representatives of various city agencies, to assist officers in their problem-solving efforts. The second consists of increasing police involvement in city planning activities at an earlier stage in the process. This makes it possible for the RPD to have more input into residential and commercial development plans for the city. This is an important issue in a city like Reno that continues to experience rapid growth. An understanding of CPTED concepts and how crime prevention is improved by smart development and planning has significantly improved this interaction.

5.3   Work-Group Facilitation

Work-group facilitation has not been prevalent in Reno to date, largely because cross-shift or multi-unit work groups have not been a major feature of Reno's approach to community policing. However, the department has sought methods for improving coordination among same-shift patrol teams, information sharing among shifts, and avoidance of redundant or overlapping problem-solving efforts. One effort in this regard is the implementation of the POP Track system to improve oversight and documentation of problem-solving projects. It is anticipated that through this system successful problem-solving approaches can be documented and communicated to other officers who are addressing similar problems.

A major effort that facilitates work-group communication is the recently completed "smart briefing room." The traditional briefing (roll call) room was totally reengineered to make it more conducive to discussion and information exchange. Seating has been configured to encourage a more participative atmosphere. A problem-solving board for each district has been created to facilitate communication within and across shifts about current problem-solving efforts. Maps and other problem-solving information will be displayed. In addition, the room is equipped with a state-of-the-art projection system for presentations and training. The redesign of this room, including the selection and acquisition of equipment and furnishings, was conducted entirely by patrol officers.

The police department has also revised its executive-level staff meetings so that they focus more upon substantive problems in the community and efforts being implemented to deal with them, instead of focusing solely on internal administrative problems. This expanded focus helps to coordinate efforts being undertaken by officers and units in different parts of the agency. Officers are often invited to conduct presentations about their projects. In addition, this orientation provides a forum for officers to showcase their problem-solving efforts and demonstrates to them the importance placed on these activities by the command staff. The department has not gone

so far as to implement a COMPSTAT approach like that used in New York City, but it seems to be attempting to gain the advantages of this type of approach.

5.4   Environmental Scanning

Environmental scanning is a growing activity that resonates in the Reno Police Department since Reno is a rapidly growing community. The department gets information from city demographers and participates in the city planning process with respect to specific residential and commercial development proposals. The police department also participates in the city's strategic planning process, which requires the preparation of annual one- and five-year plans.

On a more short-term and tactical basis, the department engages in several types of activities that have some connection to environmental scanning. These include close coordination with Reno's many special events, close liaison with gaming establishments, regular interaction with State and Federal gaming regulators, and participation in a multi-agency task force focused on technology-related crime.

5.5   Problem Orientation

The department has implemented POP Track, as discussed previously, to help support and coordinate problem-solving efforts. More importantly, the principal focus of the department's whole effort to restructure its CAD/RMS system will provide the kind of information that officers need in order to identify and analyze problems. It is clear that the department's current information and analysis systems have weaknesses that hamper officers' problem-solving efforts. As already noted, CAD data currently are quite meager and difficult to obtain; thus CAD analysis is limited, as is analysis of RMS data and mapping. Scanning is mostly based on personal observations, analysis in support of problem solving is typically unsystematic, and assessment is often lacking due to the unavailability of data. Given this situation, it is perhaps remarkable (and a testament to training and other efforts) that some very interesting and innovative problem solving takes place in the department.

It is anticipated that individual officers will significantly increase their use of data and analysis once the new CAD/RMS system is implemented. There was every indication on site that this was not just wishful thinking. It was clear that many officers are "chomping at the bit" to have data and analysis to support their problem-solving efforts. However, as in most agencies shifting to a problem-solving approach, there remain a number of officers and supervisors who are not totally on board. In addition, the department has not made a substantial investment in crime analysis/problem solving (it only has one crime analyst); thus officers cannot expect a great deal of staff support. The new system is expected to have a substantial crime analysis component, and officers themselves will be able to query the system for routine analysis issues. However, it remains to be seen if officers can and will, to any significant extent, adopt this additional responsibility in problem solving.

5.6   Area Accountability

The department is divided into three geographic districts with a deputy chief responsible for each area. In addition, there is a plan to follow this format with a similar assignment for lieutenants, shifting them from watch commanders to area commanders. This is a new development and there is little experience in the department with area accountability. As is no surprise, the current CAD system is of little help in meeting the information needs of area commanders. The department does not employ area-based work teams (e.g., beat teams) across shifts yet, nor are detectives assigned by areas. By and large the department is organized more on a temporal basis than on a geographic basis.

5.7   Strategic Management

The department maintains a strong strategic planning orientation with an ongoing planning process that produces one- and five-year plans, updated annually. With the appointment of a new chief about a year ago, the police department began reexamining some of its basic management systems and sought to realign them more closely with community policing. A particular interest of the chief is the need for training, especially field training, to correspond with the organization's community-policing strategy. The department has taken steps to implement an aggressive training agenda. Also, there is an effort to focus staff meetings more on substantive problems in the community rather than on more traditional internal administrative matters.

Two additional information-related efforts that support strategic management are the annual community surveys that ascertain the public's priorities and perceptions, and periodic focus groups of officers to obtain information about their perceptions and suggestions for changes in the department.

5.8   Future Plans Related to the Use of Information

The Reno Police Department has a very strong orientation to problem solving both in its philosophy, operational strategy, and personnel practices. To date, however, it has not had an adequate information system to support this approach. The anticipated new computer system was designed with problem-solving needs in mind and has the potential to significantly enhance problem-solving efforts. It will be interesting and important to monitor the degree to which this occurs after implementation. Based on the commitment and strategic planning evident at the command down to officer level, the new system will be utilized heavily for problem solving.

6   Summary

6.1   Overall Assessment of Information Technology

The information technology status of the Reno Police Department is typical of many law enforcement agencies. When acquiring the current information system 12 years ago, the department lacked sufficient knowledge and experience to specify their needs in such a manner as to obtain a system that would work for them. Thus the vendor

controlled this process. As a result, the system that was obtained focused more on record keeping than providing useful information for strategic and operational purposes. This system was inadequate for meeting the information needs of traditional policing, not to mention the additional analysis needs for problem solving. The department has made a considerable transition toward fully implementing problem solving, but it lacks the information infrastructure to adequately support these efforts.

This negative experience has informed the design and acquisition of a new CAD and RMS system. This new system was designed by the end users through a comprehensive process based upon work groups that were facilitated by a competent consultant. Although this process was likely not as detailed or comprehensive as that followed by the Charlotte/Mecklenburg department, it followed a similar pattern and had a similar commitment to producing information that is useful for both strategic and operational uses in a problem-solving context.

The Reno Police Department has implemented problem solving throughout the department to a great extent and certainly is in a national leadership position regarding this approach to policing. The new information technology system has considerable potential to significantly enhance these efforts and assist the organization in completing this transition.

6.2   Reno Police Department's Best Practices

Three areas can be identified as best practices from the Reno experience from which other departments can benefit. The first is the use of a qualified consultant to facilitate their design and acquisition of the new information system. Reno learned a painful but valuable lesson from the acquisition of its last system, in which it was victimized by its own lack of knowledge and by vendors not really interested in meeting the department's needs. In the current process a consultant with considerable experience in law enforcement data systems and a working knowledge of a wide range of vendors was contracted to facilitate and manage this process. By all accounts, these services were invaluable and a major key in acquiring a system that will meet their needs.

Second, the planning and design process for the new system was guided by end users. This will ensure that the potential for meeting the information needs for problem solving, investigations, and other operational functions will be maximized. Although Reno did not have much exposure to work-group facilitation, the use of end-user groups to facilitate this planning process was paramount.

Third, the department's routine use of citizen surveys for feedback about their performance and the identification of problems is unique. While many departments have used surveys from time to time, Reno has routinized this process to provide annual data. Although it would be helpful to increase the sample size to allow generalizations about specific neighborhoods, this survey has proved to be an important source of information.

Chapter **6**

Police Department

Information Systems Technology Enhancement Project

ISTEP

Case Study: Charlotte–Mecklenburg, North Carolina

April 1999

Contents

Charlotte-Mecklenburg Highlights

The Charlotte-Mecklenburg Police Department is a countywide police agency serving Mecklenburg County, North Carolina, one of the fastest growing counties in the United States. Prior to 1993, both the county and the city of Charlotte had independent police agencies. On October 1, 1993 the two police agencies were merged, and for the past five years the integration of both forces has been ongoing.

During the merge, command staff restructured administration and operations around what the department has defined "community-problem oriented policing" (CPOP). The Community Safety Plan, a document that outlined the general model for reform within the department, was developed to set the overall direction of this new organization and the implementation of CPOP. Today, the department is one of the most respected community policing agencies in the country.

Charlotte-Mecklenburg has impressive technology emerging to support CPOP. The Knowledge-Based Community Oriented Policing System, or KB-COPS, will be among other things, an information system that stores problems and their resolutions, as well as a system to prompt police officers in the field as to how they might pursue future responses. The Future Alert and Contact Network (FALCON) allows officers to link multiple databases, identify a set of events or conditions that would "trigger" information, and then act on the information provided. Once a designated condition or event has occurred, the FALCON system will automatically notify the officer of the situation either by e-mail or by pager. The department sees such a system as making the problem identification and resolution function, which is at the heart of any community policing effort, more proactive.

These unique information systems were not created by accident. Considerable vision and intense planning was involved in the department's development of top-notch technology. The Master Information System Plan, published in 1996, set the stage for technology development. This plan was developed with the assistance of a technology consultant from a local university with expertise in public sector information resource management. To develop the plan, the department conducted an in-depth information needs assessment of end users. To carry out the plan, however, the department assembled a strong team of experienced and dedicated technical and management personnel to turn the vision into a reality.

The department has also keenly managed the high risks associated with public sector information system acquisition and implementation. They developed an aggressive technology contract strategy and hired an attorney to draft and review all city technology contracts. This strategy has sought to decrease ambiguity in vendor contracts and place the city in a position to demand the contract detail and specifications necessary to make technology projects successful.

1   Purpose and Scope of Report

This case study is one of several produced for the Information Systems Technology Enhancement Project (ISTEP), a project funded by the Office of Community Oriented Policing Services. The aim of ISTEP is to increase the use of information and information technology in police departments, particularly regarding the implementation of community policing. The case studies document the current state of information technology and the use of information in five police departments: Tempe Arizona; San Diego, California; Hartford, Connecticut; Reno, Nevada; and Charlotte-Mecklenburg, North Carolina. These case studies are based on a limited review of the status of information technology in the departments. A separate cross-site report synthesizes the findings of the individual case studies. A report on the project's conceptual framework presents the overall ISTEP approach and discusses how community policing demands different types of information systems, analysis methods, and uses of information than those required under the professional-era model of policing.

This case study is based on information collected through interviews with key organizational personnel, a review of planning and technology documents and other information supplied by the Charlotte-Mecklenburg Police Department, and ride-alongs with police personnel in several patrol areas throughout Charlotte. Additional information about the department and the Charlotte-Mecklenburg region was obtained from the Internet and the Web sites of both the Charlotte-Mecklenburg Police Department and city/county government.

This report is based, in part, on three site visits to the Charlotte-Mecklenburg Police Department conducted by members of the ISTEP team. The first visit occurred on March 2-3, 1998, and focused primarily on interviews with the chief of the Charlotte-Mecklenburg Police Department and a technology consultant to the police department working on the design and implementation of a technology plan for the department. These interviews focused on understanding technology development and gaining a better understanding of the organization and administration of the Charlotte-Mecklenburg Police Department. The technology consultant is responsible for the design of the technology plan the department is pursuing, and the chief is the central figure in the reengineering of the police department and its adoption of a form of community- and problem-oriented policing (CPOP).

The second site visit to Charlotte took place July 13-15, 1998, when additional information about the department's pursuit of its technology plan was acquired and field work was conducted to better understand Charlotte's version of community-oriented policing. During this visit the research team spent time in the field in the "David" Patrol Division, a patrol area that abuts the downtown portion of the City of Charlotte.

The third and final visit to Charlotte occurred October 19-21, 1998, when most of the effort focused on understanding field operations and the decentralized form of management and operations the Charlotte-Mecklenburg Police Department has been attempting to adopt. Follow-up information on technology development and some of the training associated with technology was also pursued during this site visit. In par-

ticular, this visit included an interview with persons in the city's Information Technology Services (ITS) to explore the linkage between the police department's pursuit of technology and the efforts of the city and county to support and promote integrated technology use. During this visit, time was also spent with a major, who oversees technology development and links these efforts to the line operations of the department.

The organization of this case study document follows the overall conceptual framework for the ISTEP project. Accordingly, after providing background information on the police department in Section 2, particularly with respect to implementation of community policing, the case study describes current and planned information systems (Section 3), analysis methods (Section 4), and uses of information (Section 5). Section 6 summarizes our findings.

2   Police Department Background

2.1   Size, Overall Organization, Crime Levels, and Trends

The Charlotte-Mecklenburg Police Department is a countywide police agency serving Mecklenburg County, North Carolina, one of the fastest growing counties in the United States. In 1980 the Charlotte-Mecklenburg area had an estimated population of approximately 720,000 persons. By 1998 the Charlotte-Gastonia-Rock Hill Metropolitan Statistical Area (MSA) had an estimated population in excess of 1.3 million people. Located near the border separating North and South Carolina, Charlotte and Mecklenburg County are in the center of the country's sixth largest urban region, with nearly 6 million people living within a 100-mile radius of Charlotte. In 1998 Mecklenburg County had 245,200 households with a median household income of $41,461. The past 10 years of economic growth in this area has been accompanied by a $3.7 billion growth associated with new businesses. Charlotte is fast becoming a major regional banking center, with Bank of America (Nations Bank) and First Union Corporation being among the largest employers in the region. In addition, US Airways and several regional and national health care providers have anchored in Charlotte. In 1997 the Charlotte-Mecklenburg area had an unemployment rate of 2.6 percent, well below that of the State and the nation.

Prior to 1993, the county and the city of Charlotte each had an independent police agency. The county operated primarily in the rural parts of Mecklenburg County, while the city police department operated as a larger, urban-focused police agency. On October 1, 1993, the two police agencies merged, and for the past five years the integration of the two forces has been ongoing. At the same time, the police department has been restructuring administration and operations around community- and problem-oriented policing concepts. Because the two previous police agencies (county and city) had developed different cultures and styles, there has been a considerable struggle to fit these two agencies together.

In 1994 a new chief of police was selected and appointed Chief of Police over the Charlotte-Mecklenburg Police Department, and since that time he has been involved in integrating and upgrading the two forces into one police department. Currently,

there are approximately 1,300 police officers in this agency, and an increase to about 1,500 sworn personnel has been authorized. Prior to the new chief's arrival, the department was described as very traditional, with a somewhat small-town focus. This is consistent with the county and city's experience with growth. As previously indicated, about 20 years ago the Charlotte area was a small town in central North Carolina. Several banks and their attendant service industries have relocated to Charlotte and growth in the area has been significant. This is both a problem and a boon for the police department. On the downside, the area has grown so rapidly that simply keeping up with the growth is a major task. On the upside, the growth has been accompanied by increasing revenue and support for local agencies, especially the police department. The chief has managed to link local spending for police services with a wide array of external funding, including considerable funding from the Office of Community Oriented Policing Services (COPS) and the National Institute of Justice (NIJ). These funding streams have converged to help support both technological development and the expansion of community- and problem-oriented policing in Charlotte.

Since 1994 the department has witnessed a significant amount of change, including, but not limited to, the building of a new central police facility, the redistricting of service areas and districts to better align them with "natural" communities, and the introduction of a form of community policing that stresses decentralized decision making and accountability and the "empowerment" of local commanders and police officers to solve and address local community crime and disorder problems. Also occurring during this time was the planning, design, and implementation of a rather complex technology plan. Many of those interviewed were genuinely excited by all of the changes they have seen in the period between 1994 and the present, while at the same time many suggested that "this chief never sleeps."

The county is divided into four service areas (Adam, Baker, Charlie, and David). Each service area is subdivided into three smaller districts. Districts are then subdivided into response areas. A deputy chief heads each service area, while a captain heads each district. The department's rank structure has only five levels of management and does not include the rank of lieutenant. In addition to the four deputy chiefs assigned to the department's four service areas, there is a deputy chief assigned to the Investigations Division and a deputy chief assigned to administration, overseeing such functions as budgeting, training, and support services.

Since coming to Charlotte, the chief has emphasized a decentralized style of management, giving considerable autonomy to each service area and district. Wrapped in the cloak of community- and problem-oriented policing, the department seeks to build partnerships, open communications, and address a wide range of crime, order, and quality-of-life issues in neighborhoods.

The organizational structure and process of decentralized decision making within the Charlotte-Mecklenburg Police Department, while interesting, is also a significant complicating factor in the implementation of both CPOP and the technology envisioned by the department. All interviewed have extremely high expectations for the technology

once it is fully operational. In many respects they expect the technology to help routinize departmental functioning, while at the same time enabling a wide array of information to be brought to bear on tactical decision making and operations.

The Charlotte-Mecklenburg Police Department received 707,542 E-911 calls for service in 1998. The department responded to 517,375 calls by dispatching an officer to the scene or by taking a telephone report. The remaining calls were transferred to Fire or Medic. Between 1997 and 1998 the city and county experienced a decline in most Part 1 violent crimes. Overall, violent crime declined by 8.5 percent between 1997 and 1998, with reported rapes down 6.5 percent, robberies falling by 17.4 percent, and aggravated assaults declining by 5.1 percent. Property crime in Charlotte-Mecklenburg County increased by 1.2 percent between 1997 and 1998, although in 1998 arson, auto theft, and residential burglary were below those reported in 1997.

2.2   Community-Oriented Policing Background

The department has been going through a significant transformation process that began in 1993 and continues to the present. The various levels of change within the department are, or should be, producing a need for better and more timely information at both the administrative and operational levels. More importantly, the changes within the department are seen as furthering the adoption of CPOP, the particular mix of community- and problem-oriented policing being implemented in Charlotte. This style of policing has several distinct elements in the Charlotte-Mecklenburg Police Department.

Decentralization of the department has resulted in area commanders (deputy chiefs, majors, and captains) being tasked with improving the quality of life and safety of the residents and businesses in those respective areas. The department is attempting to shift to a results-oriented system of productivity review: the chief continues to stress that area commanders should be responsive to community needs, including crime, while at the same time being creative in solving local problems. Some interviewed are concerned that the decentralization of the department effectively creates four (five, including the central headquarters) police departments in Charlotte. This is in fact the case, where police service areas and indeed districts appear to be in competition with one another as to the style of policing they will adopt. In the long term these distinctions will be important across the organization. Basically, they center on whether community policing will be a generalist or specialist function within the respective service areas and districts. Initially, community coordinators were created in all of the service areas and districts to start the process of focusing on CPOP within the department. Certain service areas, such as the David Service Area, would like to continue the specialist model, while others, like the Charlie Service Area, focus on broadening responsibility for CPOP throughout the patrol force. In fact, much of the technology that is being implemented in the Charlotte-Mecklenburg Police Department is likely to require more line officer involvement in CPOP efforts.

Many interviewed anticipate that the technology will help in coordinating and integrating activities and initiatives across the four service areas and twelve districts. One

of the initial applications planned for the department is e-mail capability, to better link command personnel with central headquarters as well as with one another. The department does have biweekly meetings of command personnel to review plans, make necessary adjustments, and to discuss crime and problem-solving activities. In one interview it was indicated that the command staff is slowly coming around to a process of accountability and responsibility for being "on top" of local problems and issues. Most thought that information technology, including a new records management system (RMS), would greatly assist this process. At the two command meetings attended, however, it was clear that there is considerable variation in command officer understanding of and facility with CPOP activities. Moreover, it was clear in several interviews that there is still considerable internal discussion about the direction of the department and its adoption of CPOP strategies. Part of the struggle, no doubt, has been associated with the integration of two rather dissimilar police agencies that began in 1993 and continues today. Vestiges of both of the older policing systems continue to slow or otherwise alter the adoption of the proposed CPOP strategies in the Charlotte-Mecklenburg Police Department.

At the operational level, the department has created processes to increase police officer and field demands for better information. In Charlotte, police officers are permanently assigned to their response areas, and the stability of these assignments was stated to be quite high. All of the department's police officers and field managers (i.e., sergeants), as well as communications personnel (i.e., dispatchers and telecommunications specialists) have also received CPOP training (described below) following the four-step SARA model (scanning, analysis, response, and assessment). Field forces are now tasked with identifying problems and then resolving them. This typically takes the form of police officers identifying problems, and then asking their sergeants for the necessary time (off the radio) to resolve the problem. This problem-solving process has itself gone through several transformations within the department. There is also an effort afoot in the department to support CPOP interventions and decision making with information systems that are "smart" in that they provide information on how problems might be addressed, triggering decision making by officers and administrators. KB-COPS (Knowledge-Based Community-Oriented Policing System) is, among other things, an information system that will store problems and their resolutions, as well as prompt police officers in the field as to how they might pursue problem analysis and resolution. FALCON (Future Alert and Contact Network) allows officers to link multiple databases, identify a set of events or conditions that would trigger information, and then act on the information provided. Once a designated condition or event has occurred, the FALCON system will automatically notify the officer of the situation either by e-mail or pager. The department sees such a system as making the problem identification and resolution function, which is at the heart of any community policing effort, more proactive. The sooner that an officer can identify a crime pattern, links between cases, or a neighborhood disorder problem that may be the root cause of crime, the more likely that it can be solved before it has significant negative impact on a neighborhood.

Some of this experimentation with using technology to assist decision making is also occurring within selected service areas. For example, in the Adam Service Area a com-

puter program building a problem-solving database has been created. There is considerable excitement in that service area that such a database will be useful to all of the department's line personnel once the radio and telecommunications/data systems are fully operational. Currently, community coordinators in the Adam Area work on problem solving and log the results of these efforts into this system. Over time, it is anticipated that the results of such input will point to methods for problem resolution that are specific to particular types of crime and disorder problems.

As previously indicated, CPOP was initially a specialist function within districts. Community coordinators were identified as the point of contact between the department and the community in each district. These persons typically had little responsibility for radio assignments, freeing their time for community policing activities. The specialization of CPOP has drawn fire in the department, separating out radio response officers from these community coordinators. In some of the districts, captains have eliminated these positions in favor of a more generalized approach to CPOP. In other districts this has yet to happen. The implementation of CPOP across districts is currently uneven, and often linked to the personality, experience, and "buy-in" of the district captain. Furthermore, it was indicated that the level of CPOP within districts also often varied by shifts, with some shifts (typically the day shift) more closely associated with CPOP and the night and evening shifts perhaps less attached to these ideas. Nonetheless, the training of all personnel in problem solving and the migration of this style of policing throughout the Charlotte-Mecklenburg Police Department have created demands for useful and timely information.

2.3 Extent of Departmental Efforts in Community Policing

Solicitation of Citizen Input

The Charlotte city government and Mecklenburg county government appear to emphasize citizen involvement and obtaining feedback on government services. They have a website and enumerate several ways for citizens to get involved with government functions and specific departments. This orientation obviously affects the police department and its operations as well.

Within service areas there is considerable citizen involvement and attachment. The community coordinators are expected to service community concerns either directly or through some coordination of line officer activities in the affected districts. Service areas and districts also handle considerable walk-in traffic, wherein local residents and businesses contact community coordinators directly. Invariably this process also involves attendance at community meetings, as well as surveying residents and businesses concerning crime and disorder problems. Crime information for each service area and district is made available via the Internet, and the department has gone to considerable lengths to get information out to its many constituents.

To better understand community attitudes and expectations of the Charlotte-Mecklenburg Police Department, a telephone survey of a random sample of 858

households was conducted between April and May of 1995. This information provided a good assessment of community expectations about the police as well as the level of satisfaction the community had with the amount and scope of police services being provided. This information was collected as part of the Community Safety Plan, a document that outlined the general model for reform of the Charlotte-Mecklenburg Police Department (described below). The survey information continues to influence departmental decision making. Data from the survey were also analyzed for the uptown area of Charlotte. Here the focus was on feelings of safety. These types of activities suggest that the department has a program to actively encourage citizen participation and input into the department's activities and decisions.

Another illustration of community involvement is Charlotte's Citizen's Training Academy that was implemented in September 1994. This mini-police academy is designed to familiarize the community with police work and the policies and practices of the Charlotte-Mecklenburg Police Department. Forty-nine hours of instruction are provided to interested citizens who attend the academy. The department also has a Citizen's Review Board, a civic body that reviews police practices and behavior.

Geographic Focus

The Charlotte-Mecklenburg Police Department has a considerable investment in programs, systems, and technology emphasizing a geographic focus. Currently the department uses ArcView for its geographic information system (GIS) software. The capability of the GIS was initially limited by the current CAD system, which was said to have too few categories for meaningful analysis. This problem has been resolved with the acquisition of a new CAD system, planned for installation in mid to late 2000.

Crime analysis is provided systematically throughout the department, although it is not clear how much of the information is actually used as a support for problem solving tactically. It should be noted that this is an organization in transition and, while many of the "buzzwords" might be in place, it remains to be seen if this technology is being systematically used in the field. It is clear, however, that crime analysis is used to assist the chief in keeping area and district commanders informed and accountable for the level of crime and disorder in their respective areas. Moreover, it was clear that crime analysis and the use of geographically based information is likely to become the centerpiece of patrol functioning in the Charlotte-Mecklenburg Police Department in the years to come. The central question is not whether this is to happen, but how, and at what rate of implementation. Currently, crime analysts are assigned responsibility for area and district commands, increasing the likelihood that they will become familiar with local needs and capable of delivering information that will be useful locally.

The Strategic Planning and Analysis Bureau oversees the analytic functions in the department and provides support in the field for GIS applications. GIS applications are used to support CPOP in several ways. First, they serve as automated pin mapping systems that identify locations of crimes, arrests, drug complaints, and a wide range of other problems for which citizens mobilize the police. This information is displayed

on maps for the field forces; and citizens can download crime patterns for their police districts from the department's website. Second, GIS applications are used to identify crime "hot spots" by stacking calls for service and crime in particular locations.

One interesting application of this process was conducted in the Grier Heights Project using police data from January and February of 1995. The Grier Heights Project established a model for hot spot analysis in the Charlotte-Mecklenburg Police Department. The project integrated land use maps and calls-for-service data. This project is seen as a way to model problem solving throughout the city and county, and it is anticipated that this type of analysis will ultimately be used through laptop telecommunications linkages within patrol cars deployed through the city and county.

Finally, the Charlotte-Mecklenburg Police Department has formed a partnership with the Environmental Systems Research Institute (ESRI), the National Center for Geographic Information Analysis at SUNY Buffalo, and the City of Salinas Police Department. This partnership is meant to further test and develop GIS applications in a police environment, particularly in police agencies emphasizing community-oriented policing.

Emphasis on Prevention

The Charlotte-Mecklenburg Police Department, while still primarily a response-driven police department, has begun to shift operations and functions toward prevention as opposed to interdiction. The department has active crime prevention units as well as domestic violence units that are considerably focused on crime prevention. Moreover, the use of community coordinators in service areas and districts focuses attention on crime prevention and communication between the department and its communities. The department has a website that provides a substantial amount of information about preventing crime, and by all accounts "preventing the next crime" is a theme that the chief is attempting to drive into the organization.

It appears that there is considerable time available for community coordinators and indeed, patrol officers, to engage in crime prevention activities. Moreover, it appears that the department encourages this, and as officers become more involved in problem solving, they will, of necessity, need and use more crime prevention information. Finally, the information systems being developed and implemented will also include crime prevention information. For example, it is anticipated that the KB-COPS system will lead the police officer through the information requirements for completing problem analysis and investigating criminal events. At the same time, the system will provide the officer with relevant crime prevention information.

Emphasis on Partnerships

In several interviews it was stated that much of the impetus for CPOP came from the former city manager, who announced that the department would indeed pursue these ideas. He was also instrumental in merging the two police agencies, and has created a climate of interaction among city agencies that can be described as focused on neighborhood service delivery. The commitment to CPOP has continued with the new

city manager. It was also stated that relationships among city agencies in Charlotte were historically good owing to the small-town mentality of the city and the social and political culture that had grown up in the city over the years. These commitments, patterns of historic interaction, and a supporting political culture were described as helping to "push" the department down the CPOP path, while the department internally was also "pulling" the city into a community-government service delivery pattern. In essence, the circumstances in Charlotte seem rather supportive (internally and externally) of the introduction of a significant technology development plan in the police department as well as of the spread of community-oriented government in the city and county.

At the operational level, a considerable number of local partnerships have been formed. In the Adam Service Area, several city and county services are actually on-site in what could be called a mini-city hall, or one-stop service delivery center. Paying water bills, speaking with streets and recreational department personnel, talking with case workers from social services, and interacting with the police can all occur in one location. This station was seen as a model for the city; others have yet to be built, however, in the remaining service areas. Nonetheless, it is clear that the city and county governments stress partnerships, most particularly the city government. During several interviews it was obvious that command and operational personnel are well linked to other agencies and have regular communication with them.

Problem-Solving Orientation

While there is considerable evidence that the Charlotte-Mecklenburg Police Department has made significant strides in pursuing problem solving, it is not clear that such efforts have, to any great extent, permeated the police department as a whole, most particularly the patrol function. This is not a function of lack of effort, but rather of the need for many systems to come together, and for there to be enough time for officers to reorganize themselves from traditional to problem-oriented policing.

By all accounts, problem solving in Charlotte still is vested largely in community coordinators, although in some service areas, such as Charlie, an effort is afoot to generalize police responsibility for problem-solving to all operational personnel. As a result of training in CPOP, personnel are beginning to be more responsible for crime and disorder in their respective areas of responsibility. The crime analysis functions of the department are sophisticated and are now becoming more line oriented, and the technology supporting laptops in patrol cars is now coming on line. Laptops were deployed during the summer and early fall of 1998, but the telecommunications linkages and the support of wide and local area networks had yet to be implemented. This left the officers in the field capable of typing reports on their laptops and downloading those reports at service area or district stations; but the system available to them was not yet, by design, capable of more sophisticated functions. Those interviewed in the department thought that this period would be useful for officers to learn to use the laptops and to become more comfortable with them before they were required to use them extensively in their work. The implementation of this project is expected to be completed by the summer of 1999.

Adoption of Community-Oriented Policing Management Styles

The Charlotte-Mecklenburg Police Department is making the transition from traditional to community- and problem-oriented policing. As previously noted, the department has invested in many of the systems and programs associated with CPOP and has begun to develop a management system that reflects a decentralized and results-oriented style of management. But the department is still struggling with its merger, its change of location to a new station, the growth in the area, and a wide array of internal changes and interventions that are associated with moving the department closer to CPOP. As a result, the management of the department still struggles with the content and process of CPOP. The chief and certainly several of the command personnel have bought into this program, although it is not clear how far reaching that buy-in is with respect to other command personnel and downward through the ranks of the department.

2.4   Community-Oriented Policing Training and Assessment

Beat Officer Training

The department has quite an elaborate training agenda that is heavily invested in CPOP. The Charlotte-Mecklenburg Police Training Academy is located on a 100-acre campus in southwest Charlotte. The training academy houses recruit and in-service training for the department. Currently, basic law enforcement training involves 675 hours of instruction over an 18-week course of study. In addition to traditional police courses, the academy provides extensive training on effective communications, diversity, problem-oriented policing, and computer proficiency. With the introduction of laptops to the department, personnel are required to pass computer proficiency tests to assure that they know how to use the computers they are issued.

In-service training is also required at 40 hours annually. The topics used in the Advanced Law Enforcement Readiness Training (ALERT) include effective communication, problem solving, and team building, as well as tactical and legal coursework. The department also offers a wide range of courses supporting its technology interventions. These courses include Introduction to Personal Computers, Internet Usage, Microsoft Windows NT, WordPerfect, Microsoft Office Suite, Outlook 98, and Offense Reporting Systems. Through its Technology Lab, the department teaches recruits, officers, and civilian personnel computer operating systems and commercial applications designed for the department. Much of this training is in preparation for the implementation of a system of portable telecommunications through the use of laptops in patrol cars. In addition, the department has gone to considerable effort to create training manuals and have them copyrighted. The manuals are very professional and attest to the large amount of thought and program development going into the preparation of officers.

Supervisory Training

Supervisory training has followed a pattern similar to the other types of training in the department. All supervisors have received CPOP training as well as training in new

management techniques and the use of technology. The department has spent considerable resources sending supervisory and management personnel to outside training programs and has created a Charlotte-Mecklenburg Police Institute to bring training to the Charlotte area at minimal cost. The Institute was founded in 1995 and is built as a regional partnership to offer nationally recognized training.

In addition to local and regional training, the chief is well integrated into the larger police development and professional movement and regularly sends supervisory and command personnel to national programs. The department personnel are also sought after to participate in programs, often as instructors.

Community- and problem-oriented policing are clearly emphasized in all of the department's external presentations, as well as in the internal style to which personnel should be directing their efforts and behavior. The department is moving along several paths simultaneously, including decentralizing operations, increasing internal analytic and communications functions, re-engineering basic systems, building intelligence systems to support CPOP, and increasing interaction with other agencies and with the community at large. These efforts place the Charlotte-Mecklenburg Police Department in a powerful position with regard to changing the style of policing and its services to the area. As the department is in transition, many of these functions and efforts will need to be completed.

3 Information Systems

In the Charlotte-Mecklenburg Police Department, organizational leadership is primarily driving technology. Prior to the planning and implementation process associated with technology, the department had not invested a great deal in technology information systems or other apparatus that would facilitate the style of CPOP toward which it is now turning. In fact, the past systems were merely maintenance systems, largely in support of a very traditional style of policing. Much of what was there was "home grown," and the applications available were not very sophisticated. These applications were also not integrated across the department.

In 1994 the department published its Community Safety Plan (1994), a document that outlined public safety needs in the city and the county. This document indicated that violent crime was rising, youth crime was also becoming more complicated and significant, and the area had a high level of drug and alcohol abuse that was associated with increased crime. The Community Safety Plan outlined a course of action involving short-term responses to crime, including a violent crime task force, creating a juvenile crime unit, expanding street-level drug interdiction, and creating and deploying domestic violence teams. In addition, the Community Safety Plan set the stage for CPOP. As such, this plan was a type of blueprint that addressed immediate operational realignment as well as longer-term organizational reform, including information system reform.

The central goals for the department as outlined in the Community Safety Plan were to:

1. Decrease the rate of crime and increase the perception of community safety through neighborhood based service.
2. Decrease the rate of violent crime.
3. Decrease the rate of crime committed by youth.
4. Decrease the rate of substance abuse-related crime.
5. Decrease the rate of repeat offender crime.
6. Ensure the most efficient utilization of public resources in combating crime.
7. Develop and conduct an annual evaluation process (1994).

These goals undergirded the subsequent planning for technology refinement in the department. Specifically, the Plan's explanation of goal #6 included several references to improved technology. Three action plans included in this goal cited the need to:

1. Conduct a police information study and develop a comprehensive information management system (action plan 14).
2. Support a statewide integrated Criminal Justice Information System (action plan 15).
3. Support locally the development of the Mecklenburg County integrated criminal justice information system.

As part of his reform strategy, the chief enlisted the support of two faculty members from the University of North Carolina-Charlotte (UNCC). This university assistance was focused on the planning and research needs of the department and was largely responsible for the Community Safety Plan, thereby setting the stage for further refinement in planning throughout the department.

The first faculty member was brought in to reorganize and improve the Crime Analysis and Planning Units. These units were eventually combined into the Research, Planning and Analysis Bureau. This faculty member made a significant contribution by establishing GIS mapping as his first initiative and is now the director of the bureau.

The second faculty person was brought in at a later time as the information and technology consultant. The technology consultant, an information and technology specialist at UNCC, was encouraged to work with the department in assessing technology needs and creating a technology plan. The technology consultant has been with the department for more than three years. Last year she worked in the department full time. She is currently under contract through the end of May 2000.

While the Community Safety Plan set the stage for reform in the department, a subsequent report, the Master Information System Plan published in 1996, has set the stage for technology development in Charlotte-Mecklenburg County. This plan was developed by the technology consultant as an assessment of current systems, applications, and needs and as a blueprint for the development of a technology trajectory in the department.

The Master Information System Plan (hereafter referred to as the System Plan) served several functions in the department to bring technology issues to the forefront. Each

of these functions can be seen as contributing to an ongoing and systematic internal discussion about the department's path to CPOP as well as technology development in support of that path.

First, the expertise of this outside consultant is not likely to have been available within the department, since most of the staff were associated with the older department, had been primarily trained in older technologies, and were often swamped with maintaining the older systems in the department. Given the technology consultant's expertise, for the first time the department was able to systematically evaluate its technology, and at a significantly lower cost than would have been the case had an outside consulting firm been brought in to conduct this analysis. Moreover, as a continuation of the planning and strategic management of the department, the System Plan helped to continue the planning path already developed; at the same time, it was seen as an internally derived assessment of the department's needs, capabilities, and desires regarding technology development. This sense of ownership, of course, improved the chances of the report being accepted and acted upon internally.

Second, given the methodology used by the technology consultant in conducting the assessment of users (she used focus groups, key person interviews, and survey instruments), the department was able to begin to draw users into the discussion of technology. As a result, two ongoing ad hoc groups, the Records Management Committee and the Laptop Committee, became systematically involved in the definition, design, implementation, and ultimately the assessment of the technology to be introduced in the department. In addition, several spin-off efforts (or, more appropriately, allied efforts) have also occurred as a result of this initial, assessment-of-users process. For example, this effort pointed to the need to better analyze and "map" the business processes of the department. Working with the TRW consulting firm, a reengineering process was implemented in the department that examined all of the department's functions and processes. Over several months a rather large committee (upwards of 30 people) met, often for a full week at a time, to discuss and review departmental processes. This resulted in the creation of a Process Mapping Unit in the Charlotte-Mecklenburg Police Department, which is now completing a publication mapping out all of the department's processes. In many regards this has had the effect of infusing an analytic perspective within the department, which, perhaps, was not there in the past.

Third, the System Plan served as a means for the department to significantly upgrade its telecommunications and computing (information management and analysis) functions and to build a path that could be pursued within the department to achieve these goals. It is significant that the technology consultant designed and is now overseeing the implementation of the system. All too often such efforts are confronted with the disjuncture between those who design and build the system (typically those outside of the department) and those who must implement and ultimately work with the system on a continuing basis. The arrangement in Charlotte-Mecklenburg appears to create a more stable and continuous basis for systems design and implementation.

The System Plan developed in Charlotte-Mecklenburg County is built on a four-stage planning model outlined in Turban, McLean, and Wetherbe's Information Technology

for Management (John Wiley, New York, 1996). The model begins with a strategic analysis followed by assessments of organizational information resource requirements. From these materials a resource allocation plan is developed and specific project plans are then derived.

The result of this System Plan is the design and implementation of an eightfold strategy to increase and enhance technology in support of CPOP in Charlotte-Mecklenburg County. This eightfold strategy includes the following:

1. Design, acquisition, and implementation of a new CAD system for the department.
2. Expanded training for departmental members for the use of technology in furtherance of both decentralized management and tactical community- and problem-oriented policing.
3. Acquisition and deployment of 1,200 laptops, one to each police officer in the department, which are seen as the platform for officer decision making and problem solving.
4. Creation of both a LAN and a WAN system to integrate management and record keeping within the department.
5. Installation of modems in patrol vehicles to accommodate the transmission of data/information directly from cars to the central computing facilities in the department, thereby eliminating the approach of downloading data from disks often used by other departments.
6. Acquisition and implementation of a mobile data communication system, a significant portion of which will be overseen and managed as an out-source project.
7. Design and field testing of application programs, including KB-COPS and computer-aided dispatch (CAD), in furtherance of the laptop and mobile communications components of the plan.
8. Creation of a support system necessary to maintain and support the other components of this strategy.

This is a very ambitious undertaking in the department, one that has affected the organization of information and computer services in the department, and one that is likely to have a significant impact on the department in the future. At present, much of the effort has been directed to planning and acquiring contracts with vendors. In the months to come, the results of these efforts are to be rolled out by the department and overseen by an expanding technology component within the department.

The Community Safety Plan and the System Plan are publicly disseminated documents that outline technology as having a significant role in the Charlotte-Mecklenburg Police Department. As previously indicated, the Community Safety Plan had several action plans specifically focused on enhancing technology. The System Plan is completely focused on these activities. Moreover, the department's Mission Statement includes the idea that the department strives to "prevent the next crime" (implying an analytic focus), and indicates that communications and problem solving are central features of its organizational efforts to make Charlotte a safer place.

Since the department has initiated its efforts with outside (UNCC) support, it is clear that it does not believe that it has the internal capability at present to rely too heavily on internal resources alone. As mentioned previously, personnel in the Computer Technology Services (CTS) unit have programming and some systems design experience (see Section 3.1, about staffing), and the department is seeking to build its in-house capability.

Where the department has been willing to take risks is in having an internal technology consultant provide to the department's leadership (mostly the chief) a wider view of technology development and of the external marketplace that might assist the department in its quest for an improved information and communications system. The risks that the department has taken here are indeed interesting and at times run contrary to where others have gone. Two examples are highly relevant.

The first illustration of the department's risk-taking capacity is related to its laptop computer program. Initially, as in many departments, the thought of moving to laptops was accompanied by a discussion of how to make them rugged enough to survive field implementation. After considerable review and discussion, it was determined that the department would forego the process of making the computers rugged (a considerable cost in its own right) and opt instead for buying traditional laptop computers. The thinking behind this move was associated with three issues. First, it was indicated that the cost of making the computers rugged was itself expensive and would ultimately limit the growth path of technology (i.e., buying laptops that would conform to the rugged encasements). Second, the process of making the laptops rugged apparently has the negative byproduct of limiting air circulation around the laptop, and the new processors now available (Pentium II) produce heat that limits the life of the chip and can result in a faster rate of laptop failure. Third, the cost of making the laptops rugged would reduce considerably the number purchased; this, in turn, would require that laptops be assigned to cars and not to people. Such an assignment would result in no one being responsible for the laptop (they could blame the prior user) and, more importantly, the learning curve and acceptance of the new technology would be reduced. All of these factors led to a decision to give everyone (patrol personnel) a laptop, thereby increasing accountability and perhaps the sense of ownership on the part of police officers for their use and for the connection between problem solving and the data they will eventually be able to obtain from these information systems.

A second illustration of the risk taking of the department in the platform it is building in the telecommunications area is its decision to out-source a significant portion of its telecommunications process. Here the following logic was applied. First, while many departments seek to control telecommunications systems (particularly data transmission), they do so at considerable cost, while at the same time locking themselves into a system (and system maintenance costs) that greatly restricts their ability to grow along with developments in the telecommunications industry. Instead of pursuing this path, the Charlotte-Mecklenburg Police Department decided to out-source its telecommunications (data transmission only) by establishing a contract with Bell Atlantic Mobile for the creation and maintenance of the telecommunications/data transmission system. The department will maintain control over the voice telecom-

munications system. This will result in the placement of a mobile data transmission/receipt modem in each vehicle and the oversight of this system by Bell Atlantic Mobile. It is anticipated that such an arrangement will create a more responsive and more flexible telecommunications system in the long term. Moreover, since the expense for this effort will be a recurring line item in the department's budget, it is anticipated that the department will have created the capacity for continual upgrading of the system as telecommunications technology changes in the future.

The Charlotte-Mecklenburg Police Department is in the process of routinizing its training for all departmental personnel when it comes to the new system. The general model the department is using is to train a cadre of persons who would then be sent into the service areas and districts to work locally training police and managerial personnel. This will need follow-up to fill in the blanks. What is important is that training is a system that the department has included in its implementation plan.

Laptop support has been out-sourced, and the department is in the process of having a vendor establish a repair, swapping, and troubleshooting office in the Charlotte-Mecklenburg Police Department headquarters building. This laptop service center will be the prime point of contact in support of the laptop program, primarily the hardware aspects of that program. Support for the data transmission component of the telecommunications system will come from Bell Atlantic Mobile, while the CAD 911 telecommunication supports will be internal, connected with the radio telecommunications functions within the department.

The department has also created KB-COPS, which will link the department's RMS with crime analysis and mapping systems, while at the same time developing support for CPOP activities. CTS will oversee the maintenance of this system.

The vision for the department's technology plan is far reaching. In addition to the hardware systems that are planned or in the process of being acquired, the department has developed a significant internal analytic effort to better understand its business processes, reengineer them, and connect these reengineered processes with a more fully elaborated information and decisional system. The KB-COPS envisioned for the department includes a new CAD system capable of providing quicker and more accurate information on people, vehicles, and places, as well as being the repository (linked with RMS) for offense reports, field interview information, arrest information, case investigations, and property and evidence information.

Much of the hardware and software design for the Charlotte-Mecklenburg Police Department originated through the System Plan. The System Plan engaged the department in a rather thorough discussion of its information needs and current capabilities, while identifying a trajectory for technology development for the years to come. The System Plan involved all of the stakeholders in the process, identified barriers to obtaining needed information, and established the data elements necessary to create a system capable of supporting CPOP in Charlotte.

The process vision and subsequent groundwork and infrastructure developed by the department to implement the major information technology (IT) changes has been

significant. The technology consultant worked vigorously with end users in focus groups to identify information needs to support CPOP. Significant funding to support these information needs came from the city, reinforcing local commitment. The chief emphasized a team commitment to carry out new policies and projects, not relying on one or two senior-level staff to complete them.

It should be noted that IT projects frequently fail because of the amount of risk and planning required to make them successful. The department chose to manage their risk through careful development of Requests for Proposals (RFP) and vendor contracts by using city attorneys to draft these documents. Another important component in the success of this process is the extensive training provided to end users. The department dedicated staff to develop and provide five phases of training for 1,400 users.

The process has touched many of the components of the Charlotte-Mecklenburg Police Department and is seen as well connected to internal leadership and decision making.

3.1   Information Technology Staffing and Responsibility

The technology unit in the department was minimally staffed four years ago, primarily with computer programmers and systems engineers, and was located as a support service within the administrative units of the department. Today, the unit enjoys higher visibility, working closely with the administrative aide to the deputy chief over the Administration and Support Division. The technology consultant plays a large role in the unit and works very closely with the administrative aide.

CTS is the central unit overseeing technology development and implementation in the department. This unit is essentially responsible for systems design and maintenance, as well as for the development of applications. In addition to this unit, the Communications Bureau oversees the radio and 911 response, but is actively linked to the computer unit. A planning and research function that houses crime analysis, while not directly attached to the computer unit, is also an active player in this process. The CTS team has a diversity of skills and expertise, which has been crucial to the unit's success.

A final organizational design has yet to emerge. Much of this effort is being coordinated through the computer unit; as functions become self-sufficient, there is every reason to believe that they will be made autonomous, consistent with the department's decentralization and empowerment emphasis.

Before 1994, the department had not developed very sophisticated technology in support of its objectives, and planning was weak; therefore, there was not much to overcome in the transition to newer systems. That is to say, because of the relatively low investment in technical systems in the department prior to 1994, the plan is simply to sweep out the old technology and replace it. Given the disruption that the merger likely produced, there was not, at least among the people we interviewed, anyone who appeared wedded to past systems of operations. This is a significantly positive situa-

tion for the department, as it can change things without the problems of overcoming significant resistance from those who feel a need to cling to previous systems.

Prior to this effort, there were five to six people in the department charged with systems design and maintenance. Each was trained in mainframe applications, and there was little, if any, use of personal computer (PC) technology. While these people have been retained in the transition to a client-server environment, the expansion of staffing has been focused on PC systems engineers and applications programmers who can work flexibly in such an environment. CTS uses a matrix structure emphasizing project teams. This strategy is used to respond to the rapid technological changes in the department.

Most of the personnel in the CTS are civilians trained as applications or systems engineers. There are approximately 20 people in this unit, and it is anticipated that the unit will grow to about 30 people. Entry criteria require these people to be technically trained, and the department is now investing resources in skills updating and continuous training for these personnel.

Much of the current effort of CTS is in tracking vendors and purchase orders from the city and subsequently trouble shooting the vendors' design and/or implementation problems. In addition, there are several programmers and engineers who are now integrating a significant amount of new equipment that constituted the new technology environment in the department.

Perhaps one of the biggest problems confronting this process in Charlotte is the continuation of these efforts after the technology consultant returns to the university. She indicated that this is her third year with the department and that she is predisposed to return to the university, as it has now created a College of Information Technology that she will have a role in developing. The department has, however, hired a new CTS manager who has a master's degree in computer information systems and is working toward a Ph.D. in strategic management. The department is confident that the new manager's transition will be smooth.

3.2   Historical Review of Department Information Systems

This description of the information system in the Charlotte-Mecklenburg Police Department is outlined in terms of both the historic system (taken from the System Plan) and recommendations to upgrade that system. The majority of the database systems in the department resided on the city/county IBM 3090 mainframe system. The city and county shared the system, each running its own partition. CICS/MVS was used to oversee communications between terminal users and databases. City police functions used COBOL as the primary language for programming, with DATACOM DB as the database platform. The county used COBOL and VSAM, and in some cases DB2. The police department (Charlotte) also had its own mainframe (ES 9000), used primarily for dispatch.

The department has about 60 terminals linked to the mainframe and they were used only for word processing applications. These terminals are being phased out by July

1999 and replaced with PCs. Additional mainframe terminals used to access the CAD system and other files not yet moved to the client-server environment are being replaced by terminal emulation capability on the PCs.

The department used a Motorola Radio Network for data transmission to the mobile data terminals (MDTs). The department had approximately 275 MDTs, allowing officers to communicate with dispatchers and to access DCI and department of motor vehicles (DMV) databases. The MDTs also allowed officers to access warrant databases and to communicate between cars.

In terms of software, stand-alone versions of WordPerfect 6.1 and Microsoft Office were available on the 225 or so microcomputers scattered throughout the department. The department had limited connection with the city LAN and with e-mail services. The GIS was built around ArcInfo, which is PC based, and provided access to the city/county corporate GIS databases on Sun Solaris (UNIX) workstations and servers. Internal systems in the Charlotte-Mecklenburg Police Department included accident reporting, animal control, automated fingerprinting, case management, citations and warning tickets, and some crime analysis programming. In addition, a CAD and 911 system was operational. Several other applications are listed and evaluated in the System Plan. All of these systems are in the process of being upgraded, discarded, or redesigned in accordance with the System Plan's recommendations.

3.3   Information Systems Currently Used

The department is building its new system around several components, including an Enterprise 4000 that is a Unix server, Sun Solaris 2.6 PDB Cluster with 1 gigabyte (GB) memory and 75 GB drive, linked to Compaq Proliant 6000 1 GB RAM system, and to 100 megabyte (MB) ATM over Sonet. These systems will be linked via Ethernet to Pentium MMX PCs. Radio telecommunication will link radio and data transfer to cars equipped with Digital P 166 80 MB RAM, and 2.1 GB laptops. Fiber optic communications will also link area and district stations with from 10 to 100 MB capacities for local analysis and downloading. Much of the building of this architecture is already under way. Interestingly, the department was able to piggyback its fiber optic cable installation with ongoing work in the banking system, thereby defraying considerable costs and speeding up the installation of the fiber optics.

Currently, information has difficulty flowing throughout the organization. Many of the persons interviewed suggested that both the strength and the weakness of the Charlotte-Mecklenburg Police Department organizational structure lies in its decentralization. That is to say, given the depth of decentralization in the department, information communication has become difficult. At the managerial level, it was suggested, there is a problem in getting notifications of organizational changes and the like, as well as in communications with the central office. It is anticipated in the organization that these problems will dissipate once the internal e-mail system is implemented.

As indicated, the decentralized and at times idiosyncratic nature of command decision making accounts for problems in communications and information use. However, it

is anticipated that the technology will provide for some consistency in commands owing to the format and display of the reporting systems and the relative ease of communicating via e-mail.

End users have had considerable input into the design of information collection as well as the entire technological platform planned for Charlotte. They have been surveyed, have participated in focus groups, and are members of internal committees overseeing both design and implementation issues.

3.4   Information Systems Related to Professional-Era Policing

Operations Information Systems

At the operational level, the historic MDT system still provided enough information for operational decision making, although in one ride-along it was suggested that the turnaround time for MDT response to a query was often long. Again, however, it is anticipated that once the laptops are deployed many of these problems will go away. As the laptops were just being introduced during our last visit, their impact and use is as yet undetermined. Of the officers interviewed, some said they used them but were quick to admit that many of the laptops did not leave the car or get used by other officers. As on-line reporting becomes mandated this circumstance should change.

Most of the technology applications are now being coordinated through the computer unit. In the past, applications have grown up in isolation from one another as they were likely developed locally and in a stand-alone fashion. At present the emphasis in technology development and systems applications is focused on the patrol functions of the department. In one interview it was suggested that the detectives were crying for help but that the organization had made a decision to focus on patrol first, and, given the complexity of this system and of its implementation, the detectives and other units in the organization would have to wait.

Command and Control Systems

At present these command and control systems are fledgling in the department. The introduction of a new RMS was seen as a way to improve the information necessary for command and control. At the same time, the department has been examining differing uses of the CAD system to improve its fit into the RMS. Typically, the RMS is fit to the CAD, and as pointed out in several discussions, this tends to severely limit the use of data from the CAD system in the RMS, and indeed in command-and-control decision making.

Management Information Systems

Presently the system in Charlotte, given its transition from the planning to the implementation stage, remains centralized despite the decentralized nature of the organization. This is likely to be the case for some time as the system is tested and refined. In addition to this process, there are several other ongoing efforts that have created overlapping committee memberships that include rank-and-file police officers as well as command personnel. Several of these committees have interests in aspects of the technology program and its implementation. Finally, a process mapping group has also been formed in the department to map out all business

processes and to make recommendations where appropriate. This group is also likely to overlap in interest in and oversight of the technology program in Charlotte-Mecklenburg Police Department. In short, many people are watching and assisting this process.

3.5 Information Systems Related to Community-Oriented Policing

Geographic Information Systems (GIS)

As previously discussed, the department is heavily invested in GIS and its varied applications. The GIS Analysis Unit is becoming more prominent in the operational decision making of the department, and there are several efforts afoot to model "hot spot" and other geographic referent information. There is also a linkage to city planning functions such that information on land use, water bills (showing ownership of buildings), and social data are capable of being integrated with crime and disorder data. In fact, the city has gone to considerable effort to define neighborhoods and to identify the condition of these communities on a scale that ranges from stable to distressed. Such information is now being used by police commanders in the field to identify community needs and to design programs to address those needs.

Problem-Solving Information Systems

As indicated, both the KB-COPS and the FALCON systems are direct evidence of a sophisticated approach to building "smart" information systems in support of problem solving. Some of these systems are now being created locally to capture information on local problem-solving experiences. These systems will take time to refine and develop in Charlotte to see if they do indeed impact how the police use information to solve local problems. What is clear is that these systems are all pointed in the same general direction – to make information quickly available to those in the field so that they can solve community crime and disorder problems.

External Information Systems

Much of what has occurred in Charlotte, in terms of information systems, has occurred in the Charlotte-Mecklenburg Police Department. It was suggested that the department enjoys considerable latitude in the definition of its technology needs and has the support of the City Manager. As previously noted, it was suggested that the department has always enjoyed good relationships with outside agencies in both the City of Charlotte and the county. This was described as part of the local political and social culture.

As part of its planning process and included as an action plan in the Community Safety Plan of 1994, the department has been working with the city and county to create and/or strengthen a countywide criminal justice information system. In addition, the department currently has linkages with tax and water department records as well as with the city/county GIS.

In funding this program, the department has been able to patch together resources from several sources. The department is spending upwards of $18 million on this effort. Resources for this effort come from the COPS MORE program, other Federal programs (such as an NIJ grant), and from local resources, as well as from internal departmental budgets. In addition, the department has established a local foundation to support training and other departmental initiatives in an effort to build a funding stream for these programs independent of the city and county. All of these activities require building partnerships.

In one interview it was suggested that the city manager was a dominant force in shaping the department's push for CPOP and that other city department heads were directed to participate in these partnerships, although it was quickly added that such relationships were good from the start. Based on our analysis in Charlotte, this aspect of partnership formation and maintenance should be pursued.

3.6   Relationships and Experience with Vendors

The department is tied to the city's procurement process, which was not fully explored in these visits. What emerged, however, is something of considerable impact for police agencies building and/or reengineering their technical systems.

Historically, and perhaps typically, police agencies are at the mercy of vendors in the acquisition and implementation of technology. In our many visits to police agencies throughout the country, several noted that they are currently in some form of litigation regarding a technical system failure. This occurs for many reasons.

First, the departments and their city agencies often lack the real expertise to determine system requirements and to hold the feet of vendors to the fire of a schedule and time frame for effective implementation. All too often these agencies assume good faith on the part of vendors, which contributes to their own demise.

Second, police agencies are often ignorant of the market issues that confront technology companies. The rapid growth of this industry has produced many internal industry problems that play themselves out in the meeting of contractual obligations. Most vendors do not want to be tied to contracts that are too results-oriented. Rather, they want "time and materials" contracts so that they can learn along the way. The rapid turnover in personnel in this industry also affects project timeliness and completion. As previously indicated, the technology consultant suggested that the system failure rate nationally for these types of technology programs (in all fields) ran into the 70 percent level, with an annual failure cost estimated at $80 billion plus. If this is anywhere near the case, then all levels of government – as well as the private marketplace – are struggling with the same issue of how to build a system and hold the contractor to the outcomes in a timely and efficient manner.

The department has approached this problem in a unique way. First they hired the consultant and others from UNCC to be their internal consultants and to take a strong role in the process of shaping technology development as well as the RFPs flowing from these efforts. The city hired an attorney who is assigned to the city attorney's office to work solely on technology contracts. The attorney enlists the assistance of

outside counsel on an as-needed basis. Based on this approach, the department believes that it has considerable leverage in getting vendors to comply. By creating this process, the city hopes to avoid potential litigation with vendors by preparing detailed contracts to prevent misunderstandings.

4 Analysis Methods Used

The Charlotte-Mecklenburg Police Department uses several methods of information collection and analysis. Some of these methods and modes of analysis are related to the department's previous history of traditional policing. Others are now emerging as part of the department's move toward CPOP. Because these processes are unfolding at present, certain assessments are inferred from current plans rather than observed directly in field or administrative settings.

4.1 Professional-Era Analysis Methods

Crime Analysis

Crime analysis in the department is being refined on a continual basis. Over the past few years the department has put much time and effort into crime measurement and into the systems that can analyze and display crime and disorder information in a more systematic fashion. In addition to the electronic pin maps that are ubiquitous in the department, there is a serious effort to use this information as a means of defining problems and assessing impacts. The Grier Heights Project illustrates this approach.

Moreover, in each of the areas we visited there was considerable evidence that crime analysis is now making its way out of the central organization into the field. What is not clear at present are the ways in which this information is being used to actually change tactics or strategies. Since much of the technology and analytic capability is new to the department, it may take some time for these systems to take root in field practice. Nonetheless, there is considerable evidence that both the discussion within the department and the way it presents itself to the outside world emphasizes crime analysis as a primary means of understanding crime and then adjusting practices to affect crime patterns.

Operations Analysis

Operations analysis in the department is not clearly specified at present. There are meetings to examine the current and future deployment patterns of the department and there is an ongoing effort to map and then reengineer basic operational systems within the department. What is clear is that operations analysis is in place and often involves people from throughout the department. The final products of this operational analysis are expected to help streamline operations and find ways to improve efficiency and effectiveness.

The chief stresses knowing what is going on, and his administrative deputy chief has spent considerable time in planning out a better operational system, including ongo-

ing operational analysis. What is required now is time for this system to be implemented and assessed thoroughly. The Safety Plan was operationally focused and pointed the organization toward clearer operational and strategic analysis.

Intelligence Analysis

Although the department operates several intelligence functions, at the time of our visits and in the documents we received it does not appear that these systems have yet been tied to the overall improvements to internal information and analytic systems. One exception to this comment is the FALCON system. This system affords the opportunity to set the conditions one is searching for and then have the computer generate a "call" to that inquiry once those conditions are reached. To the extent that this represents an intelligence function, the system described might be used for many information and intelligence gathering efforts. In addition, the department has been in the lead in building a regional criminal justice information system and linking these systems to the State criminal history information systems. Once these systems are connected, it is clear that this access and information might be used to support intelligence operations and analysis.

Administrative Analysis

The department has an ongoing program to examine administrative functions systemwide. Much of the development in the department to date has carefully examined the department's administrative processes and changed those structures to support a more decentralized style of policing. Moreover, the department has gone to considerable lengths to define new functions and roles for nearly every position in the department so that all efforts contribute to the CPOP style of policing that they are implementing. This form of administrative assessment has now crept into policymaking in that levels of authority and responsibility are being made congruent with the changing organizational structure. All of this has been formalized and created through overlapping committees, to help increase buy-in and to increase the likelihood of adoption of these new roles and functions throughout the department.

4.2   Community-Oriented Policing Analysis Methods

Community Analysis

The department has considerable information at its disposal relative to community dynamics and needs. The city collects information on defined communities and then classifies those communities on a continuum ranging from stable to distressed. The city expects that city agencies will work to address, within defined categories, those conditions that detract from community stability. In addition, the department links land use information with social data to define neighborhoods and community problems. This information is now being linked to information on crime and disorder. Much of this effort is new to the police department, and it is not clear how the infor-

mation is being used at the tactical level. In meetings with those in the field (commanders), it was clear that they knew some of the terminology, but it was not clear if they were using the information in any systematic fashion.

Problem Analysis

This area of analysis is something the department is approaching on several levels, some of which have already been discussed. At the strategic level, the KB-COPS and the FALCON programs are problem-solving approaches in the use of information and analysis to identify problems. Community coordinators are proactive in problem analysis, and in some service areas there are ongoing attempts to routinize information on problem solving and its effects. Much of this effort is now beginning to become visible in the department; but it will take some time to take hold as the mode of police operations in the Charlotte department. Nonetheless, this is a very well thought out effort and is informationally and analytically driven.

Future Initiatives Related to Analysis Methods

Future initiatives have yet to take shape in the department. With all the changes it has made, the department will likely need some time to "settle down" before determining future analytic needs. It is clear, however, that the department has a philosophy of continually pursuing resources and activities that emphasize new modes of analysis. The department's linkage with ESRI and others is a good illustration of this philosophy in practice.

5   Use of Information

The ISTEP conceptual framework identifies seven information domains that   are critical to the successful implementation of community policing. The seven domains are community interface, inter-organizational linkages, work-group facilitation, environmental scanning, problem orientation, area accountability, and strategic management. In each of these domains, information technology can, if properly applied, greatly enhance the effectiveness of community policing.

It should be kept in mind that much of the effort in the Charlotte-Mecklenburg Police Department up to the time of our observations involved moving a highly detailed and intricate plan off the drawing board and making it operational. What is presented below is in part based on an assessment of the likely use of information and of the current strengths and/or weaknesses of available types of information. It is important to remember that the current state of the department is rather dynamic.

5.1   Community Interface

As indicated, community information in Charlotte appears to be available in the form of both social and physical data, as well as data on all types of economic and related issues. The websites for both the police department and the city contain quite a bit of

this information, and it is clear that the department and the city value having the information to describe the city and to use as a means of assessing communities. In the Grier Heights Project, this data was integrated as a descriptive analysis of community characteristics and crime hot spots.

The department has also conducted surveys in the community examining how the community perceives crime, safety, and the police department. It is not clear that this information will be an ongoing data element in the department's program, although it is clear that the chief values community information.

It is also not clear how this information is used in either the service areas or the districts. In the areas we visited, however, there was considerable discussion about the characteristics of the community that appeared to be informed by prior analysis.

5.2 Inter-Organizational Linkages

Information concerning inter-organizational linkages appears the least available of all the information sets that the department uses. We interviewed systems staff working in the city who are charged with building linkages for more facile cross-department data. However, these efforts are quite new and will likely take considerable time to develop. What is encouraging is that the discussion about cross-agency information needs is going on in Charlotte; and given the direction the department has taken, such discussions are likely to prove fruitful in the future. There are linkages between the police department and other justice system agencies, but most of these are typically linkages of the past. The department has set a goal to help build a regional crime information system and to better link this system with that of the State.

5.3 Work-Group Facilitation

We saw little evidence of work-group facilitation during our visits. Linkages among work groups are primarily managed in the traditional chain-of-command manner, even though much of the management and information systems planning has been team centered. The investigative function has not been included well in this process, at least initially.

5.4 Environmental Scanning

It is clear that the problem-oriented policing efforts in Charlotte have resulted in considerable environmental scanning; that is, the problem focus has led to more information about communities, crime dynamics, and how problems are getting resolved (assuming they are). Data sets are being created and linked that will be proactive in identifying early problem sets; an example is the FALCON system.

While such information is becoming more available in Charlotte, it is not clear that it has permeated either the tactical management or tactical operations activities in the department. When such information exists, it is not clear how it is being used to create tactics and/or strategies to address discrete problems. The language and informa-

tion are there, but the use is not yet systematic in the Charlotte-Mecklenburg Police Department.

5.5 Problem Orientation

Once fully operational, the KB-COPS system as well as the locally developed problem-solving programs will be useful information systems within the department. These are all in the developmental stage at present and will take considerable time to become operational. The local programs are likely to emerge first, and in fact the department is encouraging service areas to develop their own approach to capturing information on problem solving. It is anticipated that eventually the most successful of the programs will migrate across the department and perhaps be linked with more centralized information systems such as the new RMS.

What is perhaps most critical about Charlotte is that problem solving appears to be an emerging centerpiece of the practice of policing. Nearly all the information systems planned or in place appear to be moving toward supporting problem-solving efforts in the field.

5.6 Area Accountability

The language of area accountability is in place in Charlotte. What is not clear are the methods for assuring area accountability. Currently, rather traditional sources of information are used for that purpose, including reported crimes and arrests. In decentralizing the department, there is a tendency to allow the local areas to determine much of their own practice and procedure. This has led to some "noise" in the police department as differing perspectives on accountability are aired in command discussions. Nonetheless, the information systems being put into place can only improve access to information about how well an area or district is doing. Some of these changes will require the support of the emerging culture of the department, with an emphasis on both professional policing and responsiveness to the community.

5.7 Strategic Management

By all accounts, strategic management is perhaps the best developed of all the seven information domains in the Charlotte-Mecklenburg Police Department. The department has invested the past five years in self-examination and in monitoring its environment and charting its future. The department has also published several plans outlining its needs and the direction it is taking into the future. Internal reengineering efforts have produced considerable information on how the work of the department is conducted, and changes in these practices are currently under way.

5.8 Future Plans Related to Information Use

The efforts to date have yet to be fully realized. It is unclear what path the department will take after it assesses how successful it was in implementing all of the organizational, operational, and information systems changes described in this report.

6   Summary

6.1   Overall Assessment of Information Technology

The Charlotte-Mecklenburg Police Department is deeply involved in implementation of both IT development and CPOP. As a result, the site represents an ongoing story worthy of monitoring and continued assessment. They have an ambitious plan and have taken some very real risks in deciding to use technologies and/or systems that are not typical of police agencies (such as the outsourcing of telecommunication transmission to an outside vendor). They also have worked through many problems in making the organization adjust to technology, and technology to the organization.

At the same time, the organization has been the subject of major systems changes, including those associated with service delivery. This department has been in a state of rapid and continual change for about four years. Thus the department may be atypical in terms of the trends in other departments, but it is likely to have experienced many, if not most, of the decisional and operational implementation problems that IT and COP/POP present to a fairly large organization.

6.2   Charlotte-Mecklenburg Police Department's Best Practices

This department represents many best practices with respect to both process and product. On the process side, the systematic planning and development efforts, coupled with the internal reengineering efforts, are worthy of more systematic inquiry. The linkage with the external university, the consultant relationship it has created around IT issues, and the impact of this development are important to consider as well. The processes that the department has adopted to ensure vendor compliance with departmental needs are also important to understand.

On the product side, decisions about laptop technology, giving laptops to each patrol officer, the types of support systems that have been developed to link LAN, WAN, and field operations, and the design of a new telecommunications system are all discrete products that have emerged from the Charlotte-Mecklenburg site. Each of these areas is a matter of best practice.

In terms of the seven information needs, the department does a good job in soliciting citizen input, has a reasonable approach to building an infrastructure for problem-solving through KB-COPS and FALCON, and has some linkage with other agencies and their databases (e.g., the Grier Heights Project). These information areas are significant accomplishments for the Charlotte-Mecklenburg Police Department.

Chapter **7**

Contents

1 Overview – Information Systems Technology Enhancement Project (ISTEP)

The Information Systems Technology Enhancement Project, funded by the Office of Community Oriented Policing Services (COPS), is focused on increasing the utilization of information and information technology in police departments in support of community-oriented policing (COP) and problem-oriented policing (POP).

In the initial stages of this project the ISTEP team developed a conceptual framework document. The conceptual framework provided structure for the team in completing phase one of the project, and now assists police departments struggling with information technology (IT) planning in support of community- and problem-oriented policing. The conceptual framework identifies seven key information domains that should be developed if police departments want to implement community policing effectively. The seven domains are: (1) community interface; (2) inter-organizational linkages; (3) work-group facilitation; (4) environmental scanning; (5) problem orientation; (6) area accountability; and (7) strategic management.

The goal of the first phase of ISTEP was to learn about police department accomplishments in community policing, technology development, and the seven information domains. Phase one was also designed to gain an understanding of the internal and external processes involved in implementing information technology in support of community policing. Five police departments – Tempe, Arizona; San Diego, California; Hartford, Connecticut; Reno, Nevada; and Charlotte-Mecklenburg, North Carolina – were selected to participate in phase one of the project. These departments were selected because of their successes and experience relating to information technology and COP/POP implementation.

These departments provided the ISTEP team with open access to their operations and made command and line level staff fully available for interviews, observations, and questions. Several site visits were made to each city to gather information on community policing practices, technology planning and implementation, and assessment of the overall organizational structure. Members of the ISTEP team attended numerous meetings, participated in technology training, conducted ride-alongs, and examined specific hardware and software at each site. Individual case study reports were prepared for each of the participating departments and submitted to the COPS Office.

This phase one cross-site report synthesizes the findings of the individual case studies. It does so by addressing nine specific questions, as a means of helping other departments involved in COP/POP to learn and understand the processes necessary for IT development.

In the second phase of this project, the ISTEP team will work hands-on with a new set of departments that have demonstrated a strong commitment to COP/POP but are in the early stages of IT planning. In phase two, the ISTEP team will profile each site, define both police department and community needs, and work closely with the

departments to develop an information technology design that will support community- and problem-oriented policing. The phase-one assessments will serve as a foundation for phase two.

2   Information Technology and COP/POP

Community- and problem-oriented policing represent ways of providing public safety that are radically different from past practice. Under such models, the police are to be proactive, decentralized, and problem analytic. They are to use information more strategically while solving tactical problems. They are to be in greater communication with the public at large, integrated with other service delivery systems that impact the same geographic area, and internally more reflective and coherent. In sum, police agencies operating within the anticipated norms of COP/POP are to be thinking organizations able to adapt strategies and responses to an ever changing environment.

These new models of police organization and service delivery require significant revisions to thinking and practice regarding the police role, police decision making, and the range of outcomes the police are expected to affect. Among these outcomes are crime, disorder, fear, quality of life, and civic cohesiveness. Today police are being deployed in ways that attempt to preempt problems and create a visible police presence in the community.

Technology will likely play an increasing role in the process of reengineering or redesigning policing systems for community- and problem-oriented policing. The role that technology plays in the refinement of COP and POP strategies, however, is conditioned by many aspects of the organization and environment (internal and external) in which such changes are attempted. Organizational structure, processes, and cultures can either facilitate or hinder the advancement of both technology and COP/POP. Findings from phase-one sites amplify some common issues and concerns that suggest that several key questions about the introduction of technology in furtherance of COP/POP objectives will need to be addressed if these efforts are to be successful. We consider nine core questions that have been gleaned from the individual site analyses.

3   Is Technology Driving COP/POP or Is COP/POP
Driving Technology?

Policing systems often find themselves in transition, either leading or following the change. Community- and problem-oriented policing will require that police agencies "act smarter" in the future, in that information about problems, events, and situations will form the basis for designing effective police interventions. Technology alone, however, cannot replace a well designed and departmentally integrated COP or POP strategy. Without a system of COP/POP in place in a department, the acquisition of technology, in any of its manifestations, is a potentially empty experience.

Community- and problem-oriented policing require several fundamental changes within police agencies. These changes include decentralized management and operations; greater interaction with a wide array of client and constituent groups; increased

preparation of police officers in solving problems, handling conflict, and building consensus; and targeted analysis to identify problem concentrations and take affirmative action. Such changes challenge the foundations of American policing – namely, routine preventive patrol, rapid response, and follow-up criminal investigations.

One problem that many police agencies have is defining an organizational framework for COP and POP and then building a technology infrastructure to support that framework. The more likely approach is that the agency defines some fledgling frame of reference for COP/POP and then, in an iterative fashion, builds infrastructure while simultaneously recasting its COP/POP focus. At times COP/POP is driving the discussion of technology, and at other times technology is driving the discussion of COP/POP. Perhaps more importantly, in order to get started along the COP/POP path, police agencies must often move in that direction without consensus or closure as to the meaning of COP/POP for that agency.

In San Diego, COP/POP strategies were firmly in place well in advance of technology development. In fact, some form of COP/POP activity and programs have enjoyed the support of four chiefs in San Diego over a long time frame. This has created a climate of COP/POP in the agency and has allowed these ideas to grow. In many respects, the culture of the San Diego Police Department has been shaped to a great extent by its adoption and visible implementation of COP and POP. In San Diego some form of community-based policing has been in transition for the past 20 years. The department has had a strong commitment to neighborhood policing for many years. Police operations and decision making have been built around the neighborhood policing concept, and the design and implementation of technology in support of these strategies can be seen as a natural progression of the program. Over the years San Diego has been recognized as having one of the most coherent approaches to COP/POP, and the department has had considerable time to adapt to the expectations of the philosophy. This adaptation has included greater citizen input into police policymaking, problem solving using the four-step SARA approach (scanning, analysis, response, and assessment), increased crime analysis, and decentralized police operations.

In contrast to San Diego, COP/POP is a relatively recent phenomenon in Charlotte-Mecklenburg, which has only recently integrated two police agencies (city and county) and begun to move the agency into a community policing frame of reference. In Charlotte, the push-pull relationship of technology and COP/POP is more evident. The Charlotte-Mecklenburg Police Department has shifted focus from technology to COP/POP in an iterative fashion, such that one creates the demand, and later the reinforcement, of the other. While Charlotte is far advanced in its development of technology and other support mechanisms for COP/POP, it is not clear that this new style of policing has fully emerged in the day-to-day operations of the department.

The Reno Police Department has had a longstanding commitment to COP/POP, having implemented some of its first programs over a decade ago. Most would agree, however, that the COP/POP orientation in Reno has become more active in recent years. The department has built its COP/POP program on a generalist model (that is, all police officers are expected to do it), with a geographic focus and local accountability to neighborhood advisory groups. Much of the support for these early efforts came

from the San Diego Police Department. In respect to technology development, however, the Reno Police Department had until recently (within the past two years) relied on an information system that was essentially antiquated and detached from other city agencies. In fact, the Reno Police Department information system was created more than 15 years ago, when community policing was in its infancy, if discussed at all. As a result, this information system is generally believed to be unable to provide usable information to a COP/POP model of decentralized and targeted information needs. Moreover, in Reno the absence of adequate technical support hampers crime analysis, problem-solving information exchange, and integration with other city agencies working on similar or related problems in geographic areas.

In Tempe, Arizona, there has also been a considerable investment in COP/POP. The department has an open style of community interaction and a geographic focus, trains officers in problem solving, and reinforces that training with field training and personnel evaluations. The department can be described as a second-generation agency in that many of the principles of COP and POP are subtly woven into the culture of the department. In Tempe, technology support is housed in the department's Support Services Division and is seen as a tool to enhance neighborhood policing. Currently, Tempe has instituted a centralized IT effort to better integrate information across agencies. In the Tempe Police Department, technology is indirectly tied to COP/POP. The information systems in the department, with the exception of crime analysis, are not directly COP or POP focused.

Community policing has been a part of the Hartford Police Department's overall strategy since 1988, when the community service officer (CSO) unit was formed. CSOs meet regularly with residents and business people to discuss crime problems, work with blockwatch and other citizen groups, and facilitate communication between residents and city government. Over the past four years, community policing has advanced in a number of ways. The Hartford Police Department has aggressively sought out partnerships with other agencies, such as schools, youth organizations, and other criminal justice agencies. The department has increased its neighborhood focus and further decentralized the department around three Police Service Areas (PSAs). It has instituted weekly COMPSTAT (computerized statistics) meetings, which aim to both increase accountability among area supervisors and foster improved communications between commanders in the three PSAs. Finally, in conjunction with Hartford's new Community Court, there is a renewed emphasis in the department on quality of life issues and problem solving.

The Hartford Police Department did not rely on vendors for its computer and information systems. Instead, the department acted as its own consultant and is satisfied with the results obtained, although some in the department are concerned about the level of dependence on the current department programmers for retrieving information from the data systems. Hartford is one of the sites with considerable development in crime mapping, and much of its effort revolves around grants and other support for geographic information systems (GIS) applications and use, both within the department and as a way of sharing information with the community. In this regard, crime mapping is an important component of Hartford's COP and POP IT development.

4 Is Technology Planning Integrated with Strategic Planning?

Somewhat related to the drivers of information technology is the linkage between technology planning and overall strategic planning of the police department in question. Strategic planning involves assessing changes in the organization's external environment to better understand threats and opportunities posed for the organization by the environment. Strategic planning also involves taking stock of existing organizational strengths and weaknesses to better assess organizational capabilities and deficiencies. Comparing environmental threats and opportunities with organizational strengths and weaknesses helps to sharpen strategic issues confronting the organization. In turn, the identification of strategic issues leads the organization to develop strategic plans to address those issues, and later to action plans to make strategic emphases operational. The use of more sophisticated technologies is often stated as a strategy for improved linking of organizational capabilities with environmental opportunities.

In many of the police departments studied, strategic planning has become a fact of organizational life. In Charlotte, for example, a strategic plan preceded the development of an information systems and technology planning process. This strategic plan outlined a considerable amount of internal and external research on the Charlotte-Mecklenburg Police Department, its constituents' expectations regarding police service, and its existing capacities to meet those demands. As this department was merging the forces of the Charlotte City Police Department and the Mecklenburg County Police Department, a strategic plan – outlining the merger and, more importantly, how the new Charlotte-Mecklenburg Police Department would be organized and function – was essential to organizational transformation. Strategic planning in Charlotte also spawned the department's information system planning process, which has defined the technological trajectory for the department's future.

In San Diego, IT development and strategic planning are linked. Since the department develops much of its own systems for POP and COP and has considerable expertise in the IT field, there appears to be a reasonable linkage in the planning and analysis functions of the department. The department does struggle at times with the city agency responsible for information technology. These struggles generally revolve around risk taking. The department sees risk taking as necessary to push the envelope on COP and POP and the technology use to support these efforts; conversely, the central IT agency seeks to minimize risk and is concerned that the department may develop systems that will eventually fail, since this has happened in San Diego in the past.

In Reno there was a similar planning process in the creation of one- and five-year strategic plans. The development of an information systems plan has been the responsibility of the city's new Information Services Division, which was created in 1997. With this division, the city of Reno is trying to overcome a considerable obstacle to integrated planning and city service provision that resulted, in part, from a highly fragmented information technology environment. This environment is the legacy of past

decisions that, essentially, did not set information and systems requirements across city agencies. Agencies were on their own to craft whatever system they could. This typically led to heavy reliance on vendors for information and systems design, usually resulting in poor system performance. Lessons learned in Reno suggest that tying information systems development to strategic planning is a necessary component to the effective acquisition and use of technology by the police.

In Tempe, strategic planning is becoming a more dominant organizational activity, in part as a result of shifts in technology development from the department to the city. Information from different agencies is not as well integrated into strategic decision making or planning as it could be. The analytic functions in Tempe appear more operationally focused than strategically focused.

In Hartford, the link between COP/ POP and strategic planning is developing. IT initiatives are discussed in an annual community policing plan. In 1997, for example, the COMPSTAT process was laid out. Hartford currently has substantial experience with two technologies particularly important for community policing – geographic information systems and external information systems. Perhaps the most unique information technology-related feature in the department is their method of sharing information with community-based crime prevention organizations through their Neighborhood Problem Solving (NPS) system. There is variation in equipment and systems in the department, suggesting that, compared to other ISTEP sites, the department is in the early stages of integrating strategic and information systems planning with its strategies of COP and POP.

5　Is the Process of Designing and Acquiring Technology "Bottom Up" or "Top Down"?

In all the sites visited, the introduction of any significant technology required several prior reengineering efforts to better understand the flow of information and decisions and to recast information and communication processes in furtherance of COP/POP. Such efforts require the involvement of many people in the organization in all areas of operations. These efforts generally recognize that both "top down" and "bottom up" approaches have inherent limitations in the final adoption and acceptance of the technology to be used.

The historic experience of most of the agencies studied, when it comes to technology, is not good. Most agencies built their information systems on the advice and counsel of the vendors who were selling them equipment and systems. Internal technical expertise for assessing needs and matching equipment and systems to those needs was essentially nonexistent. Most of the information needs were translated into the design of systems to collect and warehouse reports, not to collect and analyze information that could be used both strategically and tactically. Systems purchased in the past 20 years or so preceded the "information revolution" and have fallen behind in their ability to inform any police function, most particularly one that is community and problem oriented. Police departments typically have received little help from their hosting jurisdictions on these matters. Rather, help has come either in the form of centralized control of this decision-making process, which removed the police (the users of these

systems) from their development, or in the form of "do-what-you-want" approaches, which led the police to become systematically dependent on vendors for information and implementation. Neither of these approaches suited the needs of the police agency, and more often than not these approaches led to the development of some rather dysfunctional information systems in these agencies.

In reaction to these historic problems, the agencies studied have developed several methods to help ensure that their information needs are reflected in the systems they develop. Most have linked their efforts with some form of technological consultant who can advocate for the police department and who understands technological trends and the ways the agency can take advantage of these trends (this topic is discussed in more detail below).

In most of the sites, end users are now more regularly involved in the planning stages of new technology. Overlapping groups, representing rank-in-file as well as supervisory and managerial interests, are a common feature to this approach. In most of the sites this approach is seen as very effective in both highlighting information needs and giving people the chance to "buy in" to community- and problem-oriented policing. In these ways, such committees facilitate technology and cultural change in these agencies. This is an important trend in policing to the extent that it shifts the agency from a command-and-control and policymaking form of management to one that is focused on outputs and outcomes.

6   What Is the Level of External Support for These Processes, and What Linkages with Other Information and Intervention Systems Are Present?

Police COP/POP technology systems do not operate in a vacuum. Rather, the typical experience is for the policing system to be overseen by and/or coordinated with other city or county information systems. For COP/POP to become effective, it needs to be integrated with larger city or county systems that deliver services to the public. Linkages with schools, social welfare, recreation, fire, emergency medical response, and a host of other service agents within any particular jurisdiction is the ultimate goal of COP/POP interventions. If community-oriented policing is meant to mobilize the community, and problem solving is meant to address persistent community crime and disorder problems, then linkage with other agencies and interventions is a central need of police agencies shifting from traditional to COP/POP orientations.

In most of the sites, the integration between the police department and other local or county agency functions is in its infancy; however, there are some interesting developments. In Charlotte, for example, the integration between the city and county governments has paved the way for greater interaction between the police and other agencies. In fact, Charlotte is now conducting analyses of crime patterns and is looking at land use and community and population characteristics as ways to explain and to predict crime and order problems. Charlotte has also taken the lead in linking the police department to other city and county criminal justice functions and in building greater communications in the region on matters of crime and public safety.

In Reno this process is just now emerging. The creation of a more centralized information system in Reno greatly enhances the potential for linking agency information systems. A similar situation exists in Tempe, where historically information systems had been developed within the purview of individual agencies, thereby precluding systems integration, or at least making such integration difficult. In the last year, the city of Tempe has centralized information technology in the hope of integrating information systems and building a citywide data warehouse that could be accessed by many agencies. Such development will likely increase the capacity of the Tempe Police Department to conduct environmental scans and to link service delivery with other city agencies.

In San Diego, there is an ongoing struggle for definition and control of IT between the department and the centralized IT agency. There are considerable linkages in databases that have been created by the central IT agency, and the department is beginning to use those resources in a more analytic way. Land use patterns are being mapped with crime trends in an effort to solve the underlying problems that generate crime in San Diego. In Tempe, the linkage between the police department and other agencies is tenuous, and in Hartford the linkages are programmatic rather than based on shared or linked information.

7 What Is the Mix of "In-House" Versus "Out-of-House" Expertise Shaping Technology Planning and Acquisition?

Building effective communications, computing, and analytic systems within police agencies in support of COP/POP is technically very challenging. In many agencies, internal personnel have learned to use technology over time by taking on informal technology roles or by being assigned to an oversight role and then learning as much and as quickly as possible. In some larger agencies technology specialists exist, as do other technical experts in communications and systems design and integration. Historically, however, this has not been the case.

As a result of limited internal expertise, technology vendors have greatly shaped police department understandings of and access to technology. This, of course, makes the police department in question quite dependent on the vendor for assessing organizational needs, designing systems to meet those needs, and implementing and adjusting systems once acquired.

In Charlotte, the police leadership quickly identified a departmental shortcoming in the area of planning and research, most particularly that associated with technology development. Since Charlotte is home to a large state-supported university, an arrangement was designed wherein local faculty provided assistance for this planning and development process. Such expertise was simply beyond the grasp of the police department at this point in time. Having a local expert greatly enhanced the department's ability to review its technological needs and to design a system (in the form of an RFP) that could be responded to by vendors. In this case, the vendors were responding to the department's vision and needs assessment, not to the vendors' own needs to sell their products. Having such local technological expertise also greatly

assists the department's communications with other IT personnel, while at the same time helping to hold the vendors to a contract and to their deliverables.

In Reno, after several bad experiences with technology and little capacity within the department to articulate technological needs, the department hired an outside consultant. The first consultant, however, was not up to the job and was replaced with another consultant, with whom the department is satisfied. The lesson learned from Reno is that the choice of a consultant to serve as an agent for the department is as important as selection of a vendor.

In San Diego, most development is in-house for the design and creation of RFPs for vendors. The ability to develop the RFPs reflects the high level of expertise and long-standing commitment to technology in the San Diego Police Department. The department works closely with vendors and has the assistance of the city's centralized IT agency. The department believes that it cannot use off-the-shelf systems and applications in furtherance of COP and POP and is therefore required to push systems designers for more sophisticated and responsive equipment and systems. Hartford also developed its primary information systems in-house using civilian programmers. In the future, however, reliance on vendors is likely to increase.

In Tempe, there is ample capacity in the department for planning and implementing information technology and its use. However, given the costs of such systems and the lack of systematic integration among city agencies, the city of Tempe consolidated IT as a central city function. The city is now in the process of building a centralized city information infrastructure and an accompanying city data archive that will serve many agencies. From the perspective of the police, this type of approach appears to be a lower risk endeavor for the department in its planning and acquisition of information technology and systems, but at the same time this arrangement makes the department dependent on others to solve their information problems. There are some committees in the Tempe Police Department to oversee and discuss IT issues. The assignment and location of an IT employee in department headquarters is the foundation of the linkage between the city and the department on matters of systems development and use.

8   Who Is Responsible for Integrating Technology with Operations?

Technology acquisition, implementation, and integration are the essential ingredients for program success. Integration is the linking of organizational processes and function to the new technology, in effect changing the way personnel do business within the new framework set by the technology and other programs. Often technology is acquired without such integration being fully planned or executed. The issue of integrating new technology with systems and operations is problematic for many police agencies. Frequently, those responsible for systems integration have little line experience or oversight, while those responsible for operations have only a marginal linkage with systems planning and implementation.

In San Diego, systems integration is positioned so that both the IT development staff within the police department and neighborhood policing efforts are linked at the top of the organizational hierarchy through a deputy chief who oversees both operations. This was a conscious effort to link COP/POP and IT development so that the two could interact and feed off of one another. Despite the co-location of IT and neighborhood policing, neither has been isolated from patrol and other units of the department.

In Charlotte, there has been a conscious attempt to link the expertise of the external (now internal) technology consultant with the line-command functions within the department. While the civilian consultant was instrumental in developing the plans and driving the process of systems integration and implementation, it is equally important to invest department command in the coordination and implementation of fundamental changes in the agency. While the chief is keenly aware of the planning and systems development efforts, as are the command staff in general, it is also important to specifically fix responsibility for implementation and for linkage with the wider departmental effort to implement COP and POP. The department assigned a senior command officer, a major, to oversee this process and to work directly with the civilian consultant, who has office space in the department and essentially functions as a full-time employee.

In Reno, a committee chaired by a deputy chief now oversees systems acquisition and implementation. This committee has been involved throughout the planning, RFP development, and contract award, and is likely to serve an important role in making sure the acquired systems are rolled out effectively.

In Tempe, responsibility for systems integration falls to Support Services and to a committee overseeing technology development. Given that the city now plays a significant role in acquiring and implementing technology and support systems, it remains to be seen how coordination will develop in the future.

9 How Do the New Systems and Processes Affect the Quality and Output of Police Work, and How Would These Changes Be Measured?

Ultimately, the success or failure of any technology system rests on its ability to improve police decisions and actions so that community problems are addressed and public safety is enhanced. The central theme of any of these developments should be to prevent crime and disorder and reduce the public's fear of crime, rather than respond to these concerns and events after they have occurred. As Charlotte indicated, their focus is on preventing the next crime.

Outcome assessment is perhaps the least explored of all issues that confront IT linkage with COP/POP in the cities studied. Most have little capacity or experience in designing evaluations of their programs and in understanding whether these interventions and efforts achieve measurable results that can be linked to the program. Most of the agencies studied have few ongoing evaluation efforts, since they have been,

understandably, focused on systems implementation. But without systematic formative assessment of the impacts of these efforts, it will be difficult to assess whether COP and POP are, in fact, facilitated by the new technologies being implemented in many of these sites.

10   How Does the Process of Assessment Continue?

Acquiring and implementing technology in support of COP and POP objectives are not discrete processes with a finite end. Rather, such efforts are likely to be continuous, as both the technology itself changes and the police agency's needs and capacity to use technology increases over time. Given the rapid state of research and development regarding telecommunications and computing and analytic systems, building a process for continuous process assessment and improvement is a fundamental need of any agency upgrading technology in support of COP and POP.

This need for an ongoing assessment process is linked, albeit loosely, to the prior assessment. Given the wide array of arrangements and responsibilities in the departments visited, it is difficult to estimate how these agencies will learn from their current experiences and translate that learning to new systems in the future. In San Diego and Charlotte, it appears that such assessment is indeed ongoing. This is not clearly occurring in the other sites studied.

11   How Is Such Change Financially Supported?

Technology is expensive. When a police agency decides to pursue any major form of technology development [e.g., laptops in police cars, the design of a new management information system (MIS) or computer-aided dispatch (CAD) system, or the creation of LAN and WAN infrastructure], the costs are substantial. More importantly, once on a path in technology acquisition and use, departments may find that their "sunken costs" prohibit them from changing course as both their needs and technology change.

Computer, 911, or other information/telecommunications systems are indeed expensive and take years to fully develop, implement, and structure. It is also difficult to organize the thinking aspects of any police agency for a considerable period of time. These "organizational intelligence systems" are complex, often requiring significant external support for their design and implementation. In virtually every site studied, concerns were raised about how much vendors direct and control the process of defining and implementing technology. Absent an internal capacity for better understanding organizational needs and refining RFPs for vendors, police departments can indeed be in a dependent and at times awkward position with respect to technology purchasing and use. Often those who may be charged with technology oversight in the city or county governmental system in which the police department is imbedded may themselves have little understanding of the dynamics and needs of police departments and their constituents.

Most of the agencies studied have had to use funding from a variety of sources to advance their technology objectives. Funding sources include the host jurisdiction, local fundraising, linkage with Federal and State grants, and program development targeted for IT funding from other sources. Given that these efforts typically span several years and involve literally millions of dollars, an assessment of the funding streams for these efforts is warranted.

12   Concluding Note: The Uneven Development of Information Domains in Support of COP/POP

As discussed in the overview (Section 1), in reviewing phase-one departments and the goals associated with ISTEP, we developed a conceptual framework consisting of seven information domains that were considered necessary in technology development supporting community- and problem-oriented policing. In all of the agencies studied, these domains were unevenly developed, if developed at all. For the most part, information for the problem orientation, area accountability, and strategic management domains were the most developed in the agencies studied. The community interface domain was in an intermediate stage of development at most sites, while information associated with inter-organizational linkages, work-group facilitation, and environmental scanning were the least developed in the sites studied.

Interestingly, this pattern of information development can be associated with the focus on COP and POP in each site. Problem orientation, area accountability, and strategic management can be thought of as internally driven information domains – those that police departments are most likely to identify first. Historically, information on crime, calls for service, and the locations of problems have been within the general reach of police agencies. COP and POP have sharpened the use of this information, but much of the information is collected by police agencies on a routine basis. This information serves these three domains (with some augmentation) reasonably well. In recent years, the integration of community concerns into police policy and decision making has also required the police to develop new and improved ways of communicating with their constituents. Information on community interface is a logical path for information growth in police agencies, and it appears that the agencies studied here are indeed moving along that path. Police departments have begun to use computer technology for community interface by creating local and citywide websites that provide information directly to the community. These websites vary in terms of their sophistication, but all are moving in the direction of providing direct access and information about safety, crime, and disorder to the public.

Environmental scanning, work-group facilitation, and inter-organizational linkage are areas of reasonably new information needs for the police. These information needs will require a rethinking of how the agency collects environmental (non-crime) information, works in collective associations with other agencies (including information exchange), and develops a group-think process within the police agency.

In respect to work-group facilitation, most departments still struggle with understanding the problem-solving process and breaking information down so that the system can learn from successful problem solving. Many of the sites visited are now

tracking problem-solving activities in the hope of better understanding the dynamics of the problem-solving process for discrete types of events. At the same time, information about problem solving is being collected to better understand its impacts. All too often, critics of the COP/POP process suggest that such activities are not measured well and that these efforts detract from the department's ability to provide basic services. Tracking problem solving and the work-group process will go a long way in illustrating how problem solving works and what it contributes to community safety. San Diego's POP Track program, and variations on this theme in Reno, Charlotte, and Tempe, underscore the importance of tracking problem solving as a method both for demonstrating how COP/POP works and for providing information across work groups so that problems can be worked on throughout the department.

Information on environmental scanning and interagency linkages relies on many organizations outside of police agencies. Such information is not typically resident within the agency and must therefore either be developed by the police or collected from an existing information system managed by some other agency. In most of the agencies visited, interagency relationships at the tactical level do exist. These take the form of committees that are focused on particular crime types or locations in the city. As these relationships mature and as police agencies develop more user friendly access to their own information, it is anticipated that linkages with other information sets are a likely consequence. Moreover, as cities begin to standardize and/or centralize IT development, such cross-agency information uses are also likely to occur. The San Diego Police Department has perhaps the most elaborate systems for interacting with other agencies and conducting environmental scanning activities. The department's longstanding commitment to COP/POP has permeated much of the local government as well, and the interaction between the police department and outside agencies is high. San Diego serves as a model for such interactions and for linking police and other services to focus on local crime, fear, and disorder problems.

Information Systems Technology Enhancement Project

ISTEP

Biographies

Author Biographies

Timothy Bynum

Timothy Bynum is a Professor in the School of Criminal Justice at Michigan State University and is formerly the Associate Director of the Institute for Public Policy and Social Research at MSU. He received his Ph.D. in Criminology from Florida State University. Dr. Bynum has considerable experience in policing research having been the principal investigator in over 30 national, state, and local research efforts in the area of crime and justice. He has published extensively with articles appearing in Criminology, Justice Quarterly, Journal of Research in Crime and Delinquency, Journal of Criminal Law and Criminology, and Crime and Delinquency. He is presently concluding a visiting fellowship with the Office of Community Oriented Policing Services. In addition, he was a member of the research teams of the recently concluded national evaluations of the Youth Firearms Violence Initiative and the Weed and Seed strategy. Additionally, Dr. Bynum has been the Site Director for the Detroit Arrestee Drug Abuse Monitoring (ADAM) program, formerly the Drug Abuse Forecasting Program, since 1994. He is also the Director of the Michigan Justice Statistics Center and is currently the President of the Justice Research and Statistics Association.

Gary Cordner

Gary Cordner is Dean of the College of Law Enforcement at Eastern Kentucky University, where he is also a Professor of Police Studies and Director of the Regional Community Policing Institute. He received his doctorate from Michigan State University and served as a police officer and police chief in Maryland. Dr. Cordner has co-authored textbooks on police administration and criminal justice planning and co-edited the volumes What Works in Policing?, Police Operations: Analysis and Evaluation, Managing Police Organizations, Managing Police Personnel, and Policing Perspectives: An Anthology. He edited the American Journal of Police from 1987 to 1992, co-edited Police Computer Review from 1992 to 1995, and now edits Police Quarterly. He is currently a consultant to Abt Associates on several national studies and a Senior Research Fellow with the Police Executive Research Forum. Dr. Cordner is a past-president of the Academy of Criminal Justice Sciences, the country's largest association of criminal justice educators and researchers, as well as a founder and former chair of that organization's Police Section.

Scott H. Decker

Scott H. Decker received a B.A. in Social Justice from DePauw University in 1972. He earned an M.A. in Criminology in 1974 and a Ph.D. in Criminology in 1976, both from Florida State University. He is Professor of Criminology and Criminal Justice at the University of Missouri-St. Louis. He received the Chancellor's Award for Excellence in Research in 1989. He is the author of six books, over one-hundred articles, and more than one hundred presentations. His research has been funded by the Harry Frank Guggenheim Foundation, U.S. Department of Justice, U.S. Department of Health and Human Services, National Institute on Drug Abuse and the State of Missouri. Dr.

Decker is Co-Principal Investigator of three projects that focus on youth violence funded by the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, and the Gang Crime Prevention Center of the Illinois Attorney General. Dr. Decker is Project Director of the St. Louis Homicide Project. This multi-faceted project includes research, policy and community involvement components. The St. Louis Metropolitan Police Department and University of Missouri-St. Louis are active participants in the project. Dr. Decker serves as a consultant to the Missouri Governor's Commission on Urban Violence, the Missouri Governor's Sentencing Commission and formerly served as a member of the Mayor's (St. Louis city) Crime Commission. In addition, he has provided background research for subcommittees of the U.S. House of Representatives and the U.S. Senate.

Terence Dunworth

Terence Dunworth is Managing Vice President of the Law and Public Policy Area for Abt Associates, Inc. in Cambridge, Massachusetts. He received his B.A. in Economics and Statistics from Durham University in England, an M.A. in Political Science from the University of Utah, and his Ph.D. from Michigan State University. During the past two decades, he has served as a contractor or consultant to a variety of organizations, including the U.S. Department of Justice, the administrative Office of the U.S. Courts, the Federal Judicial Center, the World Bank, the United Nations Development Programme, and several state and local institutions. Previously, he was a member of the faculty of the School of Criminal Justice at Michigan State University. His areas of research interest include policing, drug abuse enforcement policy, sentencing, problems of determining the allocation of public resources to the justice system, and the management of criminal and civil justice agencies. He has a number of publications in each of these areas. Dr. Dunworth is currently the Corporate Officer-in-Charge of the Arrestee Drug Abuse Monitoring Program (ADAM) (National Institute of Justice) and recently completed the National Impact Evaluation of Weed and Seed (Executive Office of Weed and Seed and the National Institute of Justice), the National Evaluation of the Youth Firearms Violence Initiative (Office of Community Oriented Policing Services and the National Institute of Justice), and the National Assessment of the Byrne Formula Grant Program (National Institute of Justice).

Jack R. Greene

Jack R. Greene is professor of Criminal Justice and Dean of the College of Criminal Justice at Northeastern in Boston, where he is responsible for a college enrolling 1000 undergraduate students, 160 graduate students, having a major research center devoted to topics of criminology and criminal justice policy research. Prior to assuming the duties of Dean in the College of Criminal Justice at Northeastern University, Dr. Greene was the Director of the Center for Public Policy at Temple University where he also served as a Professor of Criminal Justice. Dr. Greene received both his M.S. and Ph.D. from Michigan State University in East Lansing. Dr. Greene has extremely varied teaching, grant and research experience. He was the Senior Consultant to the Chief of the Los Angeles Police Department for a National Institute of Justice Project focused on rebuilding patrol services, increasing strategic management, and building part-

nerships with community organizations. He has held similar positions within the Philadelphia Police Department. Dr. Greene has extensive grant experience, serving as principal investigator on research grants investigating the implementation of community policing in municipal agencies, public housing communities and business districts, as well as the assessment of technology utilization in police agencies. He has also been involved in research examining school crime and disorder, and in the development of a research collaborative with the Pennsylvania Department of Corrections. Dr. Greene is the author of numerous books, monographs, journal articles, reports, and papers on the police, organizational change and the assessment of police services. Dr. Greene is the recipient of the Academy of Criminal Justice Sciences Fellow Award, for outstanding scholarship and teaching. Among Dr. Greene's publications are his most recent co-authored book Police Administration (McGraw-Hill, 1997); Community Policing: Rhetoric and Reality (Praeger, 1988) and Managing Police Work (Sage, 1984).

Thomas F. Rich

Thomas F. Rich has been an Associate at Abt Associates, Inc. in Cambridge, Massachusetts since 1994. Prior to that he worked for 12 years at Queues Enforth Development, Inc., a criminal justice software and consulting firm. His experience spans criminal justice research and evaluation, criminal justice information systems, software development, and geographic information systems. He recently directed a National Institute of Justice funded effort to introduce crime mapping to community crime prevention organizations in Hartford (CT). He is also the author of two NIJ publications on crime mapping – "The Use of Computerized Mapping in Crime Control and Prevention Programs" and "The Chicago Police Department's Information Collection for Automated Mapping (ICAM) Program."

Shawn R. Ward

Shawn R. Ward is a Senior Analyst for Abt Associates, Inc. in Washington, D.C. Prior to joining Abt, Shawn was a detective and six-year member of the Akron (OH) Police Department. While there, he helped create the Planning and Research Unit and initiated computerized mapping for crime analysis. He also formed a GIS partnership between the Akron Police Department and the University of Akron's Department of Geography and Urban Planning. Shawn has expertise in planning and managing law enforcement grant projects, including those funding technology and community policing efforts. Shawn received both his B.S. in Political Science/Criminal Justice and his M.A. in Urban Planning from the University of Akron. He is currently working on several U.S. Department of Justice funded law enforcement projects, including the Investigation of the Police Response to Illegal Firearms Markets, Impact of Multi-Jurisdictional Task Forces, the Changing Federal Role in Local Public Safety, and the U.S. Attorney General's Report to Congress on the COPS Office.

Vincent J. Webb

Vincent J. Webb is a professor at Arizona State University where he also serves as Chairman of the Department of Administration of Justice. Prior to moving to Arizona State University - West he was on the faculty at the University of Nebraska at Omaha for over 20 years where he served in a number of capacities including Chairman of the Department of Criminal Justice and Director of the Center for Applied Urban Research. Dr. Webb has worked with a number of law enforcement and other criminal justice agencies in areas such as capacity assessment, strategic planning, policy development and program evaluation. One focal point of this work has been on capacity building in the area of information technology to support data-driven decision making. Dr. Webb is currently working on projects that involve assessing the use of contemporary information technology in the practice of community oriented policing. Dr. Webb's recent publications include articles on public preferences for the allocation of police resources related to community oriented policing.

FOR MORE INFORMATION:

U.S. Department of Justice
Office of Community Oriented Policing Services
1100 Vermont Avenue, NW
Washington, D.C. 20530

To obtain details on COPS programs, call the
U.S. Department of Justice Response Center at 1.800.421.6770.

Visit the COPS internet web site:
www.usdoj.gov/cops