Police Department

Information Systems Technology Enhancement Project

ISTEP

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Acknowledgments

Abt Associates, Inc. wishes to thank the five ISTEP Phase One Departments for their willing and open cooperation in the ISTEP project. The Departments were selected using several criteria, with a department wide commitment to community policing as a primary factor for inclusion. The Departments were also selected because they had significant experience with technology innovation and were in an advanced state of strategic planning to support information technology.

We requested and, with the full support of the command staff in each department, were given virtually unrestricted access to staff and records concerning the IT developments that were under way in each location. Without this generous approach to the work we were doing and the insights provided to us, the effectiveness of the inquiry and the utility of the reports contained in this document would have been significantly diminished.

Many individuals in the departments gave us their time and expertise, and it is difficult to identify particular individuals without running the risk of leaving somebody out. However, we want to express our gratitude and appreciation to several departmental personnel at the five ISTEP Phase One sites who were particularly helpful in providing information, organizing our site visits, and contributing feedback on our case studies. In particular, we wish to thank Chief Dennis Nowicki and Dr. Maureen Brown from Charlotte-Mecklenburg, North Carolina; Chief Joseph Coughwell and Captain William Reilly from Hartford, Connecticut; Deputy Chief Ron Glensor from Reno, Nevada; Assistant Chief John Welter and Sergeant Ralph Garcia from San Diego, California; and Chief Ron Burns and Rachel Boba, Ph.D. from Tempe, Arizona.

Of course, the reports presented herein are our assessment of the information provided to us, and none of the individuals named above, or any other individuals from the departments, should be considered responsible for any deficiencies that the reports are considered to contain. Further, the fact that departments cooperated unstintingly should not necessarily be interpreted as an endorsement of the content of these reports. We would like to stress that, in our opinion, these Departments were in the top tier of police agencies that have strategically planned for and implemented information technology to support community policing. Therefore, any comments contained in the reports which may portray the Departments as struggling with planning for or implementing technology should be considered valuable lessons for other agencies.

This publication reflects the state of each Department's information systems and planning process based on site visits conducted and information gathered primarily in 1998. Due to the lengthy publication process since that time, each of these agencies has made progress – some significant – in their information systems implementation.

We also wish to thank the editors at The Cygnus Corporation for their detailed review, comments, and suggestions on all of our reports.

We especially want to thank Veh Bezdikian from the COPS Office for overseeing the project and for his diligence, effort, and insight in helping to make ISTEP a project with practical applications for the field. We also thank Veh in helping to put this publication together and providing helpful suggestions for improving the reports.

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

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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.