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Using Analysis for Problem-Solving

A GUIDEBOOK FOR LAW ENFORCEMENT

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Contents

Introduction

This guidebook provides police practitioners with a resource for conducting problem analysis. It is not a text on research methods but instead identifies issues and concerns police practitioners face in analyzing problems. This guide does not do the "thinking" for problem-solving practitioners, but instead provides a starting point and tips for effective problem analysis. Thus, users of this guide must think beyond the information provided.

This guidebook builds on the foundation presented in *Problem-Solving Tips: A Guide to Reducing Crime and Disorder Through Problem-Solving Partnerships* and complements the *Problem-Oriented Guides for Police Series*, all published by the Office of Community Oriented Policing Services (the COPS Office).

This guidebook is based on the experiences of law enforcement agencies that participated in the COPS-funded Problem-Solving Partnerships Program (PSP),[1] particularly 16 law enforcement agencies that participated in an enhanced evaluation component of PSP.[2] These agencies represent a wide range of problem-solving backgrounds and jurisdiction sizes. Each agency addressed one of six problem types in their community: drug dealing, robbery, auto theft, residential burglary, loitering, or domestic violence. These agencies received supplemental awards for resources to enhance the analysis and assessment components of their problem-solving projects. In addition, considerable problem-solving technical assistance was available to these sites from the Police Executive Research Forum (PERF). Site visits were conducted and reports were reviewed in preparing this guidebook.

[1] The Police Executive Research Forum (PERF) conducted a National Evaluation of the Problem-Solving Partnerships Program through Cooperative Agreement 98-CK-WX-K001. A summary of major findings from this report is available at www.cops.usdoj.gov.

[2] The sites participating in this effort were Huntsville, Alabama; Glendale, Arizona; Scottsdale, Arizona; Cathedral City, California; San Diego, California; Routt County, Colorado; Stonington, Connecticut; Lake Worth, Florida; Miami, Florida; Champaign, Illinois; Springfield, Massachusetts; Lakewood, New Jersey; Nashville, Tennessee; Arlington, Texas; Seattle, Washington; and Tukwila; Washington.

The sections that follow discuss approaches to analysis, strategies to collect information, and principles to consider in the analysis process. The emphasis here is to encourage problem-solvers of all levels of experience to be creative and innovative while maintaining structure in their approach. Although innovation is encouraged, analysis must be conducted in a systematic and structured manner to address community problems effectively.

What Is Analysis?

According to Herman Goldstein, analysis is an in-depth probe into all the characteristics of a problem and factors contributing to the problem. "Analysis requires the acquisition of detailed information about offenders, victims, and others who may be involved in a problem, the time of occurrence, locations, details about the physical environment, the motivations, gains and losses of all involved parties, and the results of current responses."[3]

What is a problem? Many people define a problem as "two or more incidents, similar in nature, that concern the police and the public." Problem-solving is based on the belief that patterns and trends can be discovered that reflect the causes of the problem. Analysis is the key to detecting these patterns and planning an effective response.

Why an Analysis Guidebook?

The National Assessment of the COPS-funded PSP program indicated that analysis was the weakest phase of the problem-solving process.[4] This same study also indicated that police often have difficulty "clearly defining problems, properly using data sources, conducting comprehensive analysis, and implementing analysis-driven responses".[5] This is presumably

[3] Goldstein, *Problem-Oriented Policing*, 1990: 36-37.

[4] PERF, *PSP National Evaluation Final Report*, 2000: 42.

[5] PERF, *PSP National Evaluation Final Report*, 2000: 35-46.

because these are not typical or traditional law enforcement tasks. Analysis is arguably the most crucial phase of problem-solving because it involves the discovery of and focus on the underlying factors often responsible for producing a problem.

Although police have always solved problems, problem-solving was formalized in 1990 when Herman Goldstein released his book *Problem-Oriented Policing*. Goldstein's problem-solving approaches differ from informal methods in their structure, process, and organizational support. Problem-oriented policing advocates various activities and structures that fall under a general problem-solving framework. Problem-oriented policing enhances traditional policing strategies in that it:

- emphasizes the ends of policing as well as the means
- seeks out the long-term results of a response as well as the immediate customer-service-driven response
- addresses the causes of the problem in addition to its symptoms
- addresses the factors, situations, and conditions of the problem.

Probably the best known process for operationalizing problem-solving is the SARA model, which emphasizes four phases of the problem-solving process: scanning, analysis, response, and assessment.

Scanning is the initial identification of the problem, where problems are defined as a group of related or recurring incidents or a particular concern of the community.

Analysis is an in-depth exploration of the problem and its underlying causes.

Response implements an analysis-driven strategy to address the problem, focusing on the factors identified in the analysis phase.

Assessment consists of ongoing review and monitoring of the progress of the response in achieving its objectives.

Analysis activities represent the steering mechanism of problem-solving, which is based on the belief that patterns and trends exist that reflect the causes of the problem. Analysis is important because it:

- is the key to detecting patterns and implementing related responses
- identifies factors related to the problem or facilitating the problem
- can be used to discover the location of the problem
- can reveal repeat offenders and offenses
- can discover helpful facts regarding crime victims
- addresses causes rather than symptoms.

Creating the Foundation for Analysis

Early in the problem-solving process decisions are made that determine the nature, scope, and value of the analysis phase. The analysis phase is preceded by the scanning phase, which initiates problem-solving through problem identification. Observations from the field indicate that police are generally good at identifying problems but experience difficulty with problem analysis.[6]

Developing questions for problem analysis appears to be particularly challenging. When determining what questions to ask about the problem, it is important to identify available data sources for answering the analysis questions. If it is not police data, thought must be given to how the police can gain access to it. If such data is not known to exist, plan how it will be collected (e.g. via external partnerships, surveys, interviews, formalized observations).

When developing analysis questions, identify as many in advance as possible; additional questions will arise as the problem-solving project progresses. However, weed out analysis questions that will produce irrelevant information. This process is challenging because it is not always possible to know ahead of time if certain questions are relevant. If the analysis is constrained to only what we know is relevant we may miss important factors related to the problem. At the same time, just collecting random facts about the problem may hinder a productive analysis.

Unstructured analyses typically result in large amounts of data, confusion over the meaning of data, and non-analysis-driven responses. These potential problems can be minimized with a careful structuring of the analysis. A well-structured

[6] PERF, *PSP National Evaluation Final Report*, 2000: 35-46.

analysis plan should include the principal questions to be addressed, sources of data for each, a schedule for completing the tasks, and the responsible parties for conducting the activity.

Order of Analysis

One question that often arises in conducting analysis is "where to begin?" Analysis activities can be ordered in many different ways; the particular order should be determined by the specific problem and agency situation. However, there are some points to take into consideration as you determine the order of analysis activities.

Sample Questions for Determining the Order of Analysis:

- What parts of the analysis can be strengthened by what is learned in other aspects of the analysis?
- What do I know about the problem? Who should be consulted to develop a better understanding of the problem?
- What type of analysis activities must be conducted (e.g. surveys, interviews, etc.)? How time intensive is each activity? What type of assistance and expertise is needed in designing, administering, and managing each activity? What type of assistance and expertise is needed in analyzing the findings from each activity?
- Who should implement each activity?
- At what point will initiating each activity complement the analysis plan?
- What data (police department data or data from external agencies) are available to develop a better understanding of the problem? How accurate are the data? Do I need assistance from anyone to gain access to the data and to analyze the data?

If certain parts of the analysis can be strengthened by what is learned in other aspects of the analysis, then certainly these should be conducted first. For example, if you are analyzing a burglary problem it may be important to know the general pattern of burglaries before finalizing your analysis plan. Offender information could be obtained from official records, and offender interviews could be used to determine if and what factors offenders use when identifying burglary targets. Through the initial inquiry information is learned and then built upon in subsequent stages of analysis.

Other situations might require the early involvement of key individuals or groups when determining the order of analysis activities. For example, in a number of situations patrol officers may have considerable information about the problem and are likely to be involved in implementing the response; therefore, their understanding and support are important to the problem's resolution. Involving patrol officers early in the project communicates to them that their involvement is both meaningful and important.

Certain aspects of the analysis may take more time than others. Analyses that require information from non-automated sources will naturally take longer because data must be collected and entered into an automated source before analysis. For example, community surveys are time consuming because respondents have to return them and then the data have to be entered and analyzed. Time-consuming data collection and analysis efforts should be initiated as early in the analysis process as possible.

However, depending on the circumstances, it may be beneficial to obtain a broad overview of the problem from automated data systems early in the analysis process.

This relatively low-cost, easy process is generally helpful in identifying analysis questions. It is imperative, however, that the analysis continues after this point and that the urge to jump to responses at this stage is resisted.

As in many aspects of problem-solving, there are no hard and fast rules regarding the analysis process. The order of analysis activities depends on specific aspects of the problem, the data needed to address it, and the data initially available. What is critical, however, is early formulation of a plan to govern the order of analysis activity. This plan should specify the relationship of analysis questions to the various components of the analysis. Formulating and referring to this plan will ensure an orderly and efficient progression of analysis and will aid in the analysis, comparison, and interpretation of data from different sources.

The Analysis Team

Forming an analysis team can be an effective strategy to generate relevant analysis questions. The team should be composed of individuals representing relevant interests and perspectives regarding the problem. The nature of the particular problem may suggest individuals that should be involved, but effective teams typically include:

- *Patrol officers* because they have the most frequent contact with the problem.
- *Crime analysts* because they know and understand available data.
- *Sergeants and lieutenants* because they provide supervisory support.
- Possibly *external researchers* because they have the expertise in research methods and data analysis.

Depending on the problem and specific situation, individuals affected by the problem, such as community residents, may be useful members of the analysis team. However, team members need to be objective throughout all phases of the problem-solving process, and in many cases some community residents may find this difficult.

The initial task for the team is to generate questions for analysis. The team might convene a meeting to have a broad and unrestrained discussion about the problem. The idea is to put everything on the table that you would like to know about the problem. It is important that this discussion center upon the questions and not the answers. In any discussion of this type it is natural, once questions are posed, to put forth what one presumes to be the answers. However, the focus here is on what you want to know, not what is believed to be the reason for the problem. By immediately jumping to answers, the team may overlook information, which precludes innovative and effective responses.

Personal experience can generate very valuable information about problems, but it can also limit understanding of the causes of the problem. Experiences are often limited by time (e.g. shift), location (e.g. beat), or other circumstances. Thus, it is beneficial to include the experience of others in the analysis and to collect this information in a systematic way that is not influenced by individual perceptions.

Generating Useful Analysis Questions

A useful framework for generating analysis questions that may reveal the nature of a problem is the "crime triangle", which is used to represent three elements of crime: *victims, offenders,* and *locations*. Within each of these elements, the traditional

who, what, where, why, when, and how questions provide an excellent starting point for finding relevant details about a problem.

Figure 1: Crime Triangle

Every problem requires individual analysis because details about the victims, offenders, and locations will vary according to each problem and jurisdiction. In general, however, questions relating to the demographics (e.g. age, race, gender) and other potentially relevant factors of each crime triangle element should be included in every analysis plan.

Victim-oriented analysis questions that frequently produce relevant findings relate to the victim-offender relationship, victimization rates, and crime prevention actions the victim may or may not have taken (e.g. locking doors, parking location of vehicle). *Offender* data relating to the number, type, and location of prior offenses are often helpful. Some offenders may specialize in specific offenses or locations, which significantly contributes to the problem. Offenders' addresses may indicate if the problem has neighborhood roots or if offenders are being attracted to specific locations. Offender interviews can reveal how offenders select targets and aspects of the offense location that made it attractive.

Analysis questions for the *location* element of the crime triangle must go beyond a simple description of the crime location. How are the characteristics of the problem location related to the occurrence of the problem? In addition to grouping or mapping incidents and conducting environmental surveys to understand how the lighting or access patterns contribute to the problem, consider how other aspects of the location contribute to the problem. For example, what is the pattern of access to areas in which drugs are being sold, or where are drugs being stashed before sale?

There are people or things that can exercise control over each side of the triangle, so that crime is less likely. Offenders can sometimes be controlled by handlers, such as the police or probation and patrol officers. Targets and victims can be protected by the presence of guardians. Places can also have guardians, or managers, influencing both offenders and victims. Successful problem solving relies on understanding not only how all three sides of the triangle interact, but also how offenders, victims and place are, or are not, effectively controlled by others.

Analysis Length

How comprehensive does a problem analysis have to be and when has enough analysis been done? Successful problem-solving requires ongoing analysis; analysis is rarely stopped, but frequently halted while other aspects of the problem-solving project are conducted. Thus, after moving to other stages of the problem-solving process, it is advisable to simultaneously continue reviewing the factors associated with the problem to monitor the effects of the response and determine if the nature of the problem has changed. For

example, a response to a street drug market location might be based on an analysis finding that the sellers will sell to anyone who wants to buy drugs. After an effective response to this problem is implemented, the sellers may adjust and sell only to people they know. Ongoing analysis will indicate that the market changed and a different response is required.

Practically, however, there comes a time when you must conclude the initial analysis and move to response. Many departments continue to conduct analysis to ensure that enough has been done, but this can result in an overabundance of data. Useful tips for knowing when to transition from analysis into response development include the following:

- similar "answers" are discovered about the problem from different sources
- the target area is refined
- the target group is refined
- the original project objective is refined
- there is an improved understanding of factors contributing to the problem
- the problem-solver understands why current responses are effective or ineffective.

When moving toward response, consider including the people or organizations that might support your analysis-driven response(s).

Principles of Analysis

There are several considerations to remember when planning and conducting problem analysis. These principles will set the analysis framework.

Principles of Analysis:

1. Analysis is based on common sense.
2. There is no one way to do analysis.
3. Individual problems require individual analysis.
4. Analysis requires creativity and innovation.
5. Analysis does not need to be complex.

Analysis Is Based on Common Sense

It is a common misconception that analysis requires complex and even mystical processes. Good analysis will include some research methodology, rules, and even statistics, which are not typical activities for law enforcement. However, the analysis process also relies on the officer's experience and ability to determine what is known about the offender, the offenses, the locations, and the victims. The questions addressed through analysis are based on an understanding of the problem and careful thinking about what factors are related to the situation. Determining what data to collect is guided by creative thinking about what needs to be obtained. Although the analysis of data may present some technical challenges, the key to problem-solving analysis is common sense.

There Is No One Way To Do Analysis

There is no **one** way to do analysis. Analysis produces information. Done appropriately it will generate valuable knowledge about the problem and suggest potential responses. There are often many ways to produce such information. Some of these approaches may be preferable to others in the quality of the information that they will generate. Although, the nature of the problem may suggest ways to obtain this information, most problems lend themselves to multiple analytical approaches.

Individual Problems Require Individual Analysis

Every problem warrants its own analysis. Because an analysis plan was successful in one location does not guarantee it will be successful elsewhere. Similarly, because analysis findings drive response selection, a successful response in one jurisdiction does not guarantee the same in another jurisdiction, where circumstances, contributing factors, and available information may differ.

Although individual analyses are necessary for successful problem-solving, this does not mean that each analysis must reinvent the wheel. Much can be learned from the experience of other jurisdictions; it is wise to consult other agencies that have conducted analysis on a similar problem. Models or templates for analysis of similar problems can be particularly helpful. However, each jurisdiction must think for itself what is appropriate and best for its particular problem and community.

Analysis Requires Creativity and Innovation

Just as principles of community policing and problem-solving encourage thinking outside the box, analysis should also be creative. Many problem-solvers limit their analysis to reported incidents. Although this is often an important source of information, other sources should be considered as well. For example, the analysis of a street drug sales problem might include gathering information about the number of individuals involved and the specific times of drug sales. Incident reports typically include only information about the offense, not about the general conditions surrounding the incident. Some departments have used other less traditional methods to obtain this general information. Undercover officers, patrol officers, and even neighborhood residents have been used to make and record observations of such activities at specified times. Additional sources of information that can clarify the problem and drive more creative responses could include changes in usage of a target areas, property values, business profits, medical data, and building occupancy rates.

Analysis Does Not Need To Be Complex

Bringing in a researcher and statistician to participate in the analysis can be advantageous for certain questions and problems, but it may produce analysis that is more sophisticated than necessary. In most cases, simple frequencies of events, percentages of various categories, and tables showing how characteristics relate to each other (e.g. type of burglary by time of day) are sufficient for an adequate analysis. The analysis should focus on how to best characterize the problem and what characteristics are most frequently associated with the problem. The purpose is to discover points of intervention for responses, not to prove causation. There is a role for more sophisticated analysis, but in most cases it is best to keep it simple.

Impediments to Conducting Analysis

Impediments To Conducting Analysis
• Emphasis on rapid response. • Lack of institutional and organizational support for long-term responses. • Requirements for nontraditional police activities. • Perception that all the information needed has been collected. • Tendency to want to do something about it now. • Hunches and or experience driving disparate response selection. • Perception that specialized knowledge is necessary. • Perception that analysis requires too much time or resources. • Perception that analysis is irrelevant to the action that needs to be taken. • Perception that once done, analysis can never be revisited.

Despite the importance of analysis to problem-solving, in many cases this phase of the SARA process is given minimal attention (Sampson and Scott, 2000). There are a number of natural impediments to conducting analysis in police agencies.

Police agencies have traditionally emphasized rapid response to situations. Although many incidents require quick responses, other activities may require more time to develop an effective response. For example, if a particular location is the site of continued calls regarding loitering and disruptive truants, one response is to dispatch officers to disperse these individuals and report them to their school. Another approach is to determine the attraction of this location for these youth and attempt to alter these factors. Adopting the

latter problem-solving strategy does not mean that the former, more immediate response is not undertaken. Both responses might be appropriate. An analysis approach that actually determines the attraction of that particular location may resolve the problem over the long term.

Taking the time to conduct analysis has been difficult for a number of law enforcement agencies that have adopted the problem-solving approach. Police agencies are not only reluctant to postpone responses in favor of a long-term strategy, but often are not organized to support such activities. Problem-solving strategies often require communication and activities that are coordinated across shifts. However, such communication is difficult because law enforcement agencies are largely organized to respond to calls or address specific crimes or incidents. Even if there is organizational support for long-term response strategies, speedy responses might be necessary because of political, media, or community pressure. There is also a natural tendency to want to do something about a problem immediately.

In most cases, analysis activities are somewhat foreign to traditional policing activities. Collecting and analyzing data in police departments is usually the responsibility of a crime analyst, whose activities may be more administrative than tactical. Crime analysis often focuses on generating reports on overall reported crime or searching for patterns to solve individual crimes. For problem-solving to be effective, analysis must be a more mainstream police activity than is traditionally the case. Although there is no one specific method or structure to best accomplish this, the analysis function must be central to the problem-solving process.

The use of analysis for problem-solving may also be limited by a perception that it is not relevant. Officers spend a great deal of their time dealing with community problems and acquire specific and valuable knowledge about offenders and locations of criminal activity; they often tend to believe that additional information is not needed. However, although much can be gained from an officer's street experience, this type of knowledge is sometimes incomplete. For example, consider a residential burglary problem on a particular beat. An officer's shift assignment may influence his or her perception of the problem. If burglaries are most often reported during the day regardless of when they occur, night shift officers may be less aware of their occurrence. Similarly, if the jurisdiction has community service officers taking reports or these reports are taken over the phone (or through other alternative reporting methods), patrol officers may also be unaware of these offenses. When conducting analysis, the team should look beyond experience and include various types and sources of information and knowledge.

Analysis often may not be attempted because of a perception that it requires significant specialized knowledge. Although some specialized skills can be helpful, the logic behind analysis should be straightforward and the analysis itself need not be complex.

While analysis is a crucial stage of problem-solving, it is the
one that often presents the most problems for police agencies.
As noted above, analysis is often perceived as requiring too
much time and too many resources, being irrelevant to the
action that needs to be taken, and requiring specialized skills
and knowledge. Each of these viewpoints detracts from one
of the central tenets of problem-solving; crafting effecting
responses depends on fully understanding the problems and
the underlying factors associated with it. Responses based
upon inadequate or incomplete analyses will not address the
causes of the problem and are much less likely to produce
the desired results. Table 1 below provides a summary of
reported obstacles encountered by PSP grantees attempting
analysis.

Table 1: Obstacles Encountered in Collecting and Analyzing Data

Type of Obstacle	Number (Percentage)[a] of PSP Grantees	
Difficulty obtaining data	126	(28.2)
Difficulty organizing existing data	108	(24.2)
Public apathy	80	(17.9)
Bureaucratic/funding/technological delays	57	(12.8)
Other obstacles	46	(10.3)
Public resistance	39	(8.7)
Officer resistance to problem-solving tactics	26	(5.8)
Lack of support from mid- and upper-level management	15	(3.4)
Political pressure or interference	12	(2.7)
Inaccurate, unreliable, or inconsistent data	12	(2.7)
Conflict with partner	9	(2.0)
Lack of available information	9	(2.0)
Need to manually code or recode data	3	(0.7)

Prepared by PERF through Cooperative Agreement #98-CK-WX-K001, awarded by the
Office of Community Oriented Policing Services, U.S. Department of Justice.
Data source: COPS Report on Analysis.

[a] Percentages based on a total of 447 grantees. Obstacles are listed in order of largest to smallest
percentage of grantees that responded positively to the question.

Analysis Tools for Problem-Solving

Many tools or data sources can facilitate analysis and the problem-solving process. Conducting an overall review of source availability and accuracy early in the analysis process helps clearly define a problem, generates useful analysis questions, determines the order of analysis activities, and facilitates discussion for the analysis team. Table 2 on page 20 lists the most frequently used data sources by PSP grantees, and the sections that follow show why certain sources are useful, when such sources tend to be most useful, and tips for effectively using them.

Police Department Data

Computerized Incident and Call Data

Perhaps the most common source of data used in problem analysis is official police department data such as reported incidents and calls for service. These data are often relatively easy to obtain, familiar to police department analysts and personnel, and can provide a "big picture" view of a problem. Incident and call data are beneficial because they:

- are easy to obtain
- are readily available
- provide historical perspective
- provide a baseline source[7] to assess problem-solving effect.

[7] It is important to identify and collect data before and after response implementation to assess the effect of the problem-solving project. For more information about assessment see John Eck's companion *Assessment Guide* to the *Problem Oriented Guides for Police* series.

Table 2: Analysis Data Sources Used by the PSP Grantees

Data Source (in order of greatest frequency)	Number (Percentage)[a] of PSP Grantees	
Incident reports	233	(88.9)
Calls-for-service records	224	(85.5)
Officer perceptions, observations, surveys, and interviews	204	(77.9)
Arrest reports	203	(77.5)
Partner or stakeholder information	183	(69.8)
Community surveys	164	(62.6)
Victim interviews	142	(54.2)
Offender interviews	124	(47.3)
Field interviews	123	(46.9)
Targeted resident surveys[b]	102	(38.9)
Mapping and GIS data	100	(38.2)
Court and municipal agencies	64	(24.4)
Relevant literature	63	(24.0)
Social service agencies	54	(20.6)
Environmental surveys	52	(19.8)
Other law enforcement agencies	45	(17.2)
Other government agencies	36	(13.7)
Media	34	(13.0)
Other criminal justice agencies	31	(11.8)
Other sources[c]	29	(11.1)
Local real estate and tax records	23	(8.8)
Insurance records	11	(4.2)
Medical records	5	(1.9)
Transit agencies	2	(0.8)

This was prepared by PERF through Cooperative Agreement #98-CK-WX-K001, awarded by the Office of Community Oriented Policing Services, U.S. Department of Justice.
Data source: PERF Scanning/Analysis Survey.

[a] Percentages based on a total of 262 grantees (m=0). Data sources are listed in order of largest to smallest percentage of grantees who responded positively to the question.
[b] Several grantees apparently considered "community surveys" and "targeted resident surveys" to mean the same thing.
[c] Other sources include informants, digital pictures, and attorney surveys.

However, for all of their considerable strengths, computerized incident and call data have several noteworthy limitations:

- They reflect only incidents of the problem known to police.
- They include only crime reports, not quality of life issues such as loitering.
- They provide limited detail.

These data might prove less beneficial if they are not analyzed appropriately. Remember to think creatively. Although analysis often begins with a set of common questions (location of the offense, date and time of the offense, and victim and offender characteristics), the analysis should not be limited to these items. For example, when analyzing an auto theft problem, consider the location of recoveries compared with the location of arrested offenders' addresses. Similarly, analysis of a drug location should involve comparing the proportion of drug arrests in the problem area to similar areas. This analysis could also include looking at the prior arrests of the offenders within the jurisdiction to determine if the arrested sellers reside in this neighborhood or elsewhere.

Analysis is often based on a standard reporting unit such as incidents or calls in a particular beat. Although this can be helpful, it is often more helpful to look at smaller units that are directly associated with the problem. Drug dealing, for example, is quite location specific, and a broad beat analysis will make developing an effective response more difficult. By narrowing the focus to a particular street corner, block, or apartment building, the response will be easier to implement, resulting in more measurable, effective problem-solving.

Automated records can also be used to determine locations of repeated calls for service. Are there addresses or blocks with a disproportionate number of calls for service regarding the problem? This is a straightforward but under-utilized method of using existing data to determine if the problem is related to repeated victimization of individuals or locations.

Incident and call data can be very helpful if used appropriately. In the future, the technical design of record systems must support problem-solving; in the meantime, users must think creatively about how available data can be compared to tell a story about a problem.

Incident Reports

Information from automated records is often limited in the details that it can provide about a problem. In many instances, the information is not in the records system but is in the original incident report. If important information for problem-solving is not available from automated records, it may be possible, with a little effort, to collect this information from police reports. For example, for a problem-solving project on convenience store robberies, it may be beneficial to obtain information on the nature of the response of the clerk, the number of clerks on duty, and other aspects of the situation that may influence the offense. Similarly, in a problem-solving project on auto theft, it might be helpful to know if the car was locked at the time of the theft. This detailed information would rarely be in a computerized information system but should routinely be in police reports.

Although reviewing police reports may sound quite onerous, it can be made into a manageable task because most problem-solving efforts focus on a certain type of offense within a specific geographic area in a definite time period. The automated information system can use these criteria to

select the cases for detailed review. For example, auto theft reports for a particular beat can be reviewed for the past 6–12 months.

Before reviewing incident reports, determine the specific items desired based on the analysis questions specified in the analysis plan. To save time, reports should be reviewed only once; therefore, it is important to collect data in a systematic manner and not just read reports to get a feel for the offenses. An analysis-based data collection form can be used to code information from the incident reports. This form would include a space to put codes (e.g. 1 = car locked or 2 = unlocked) for each of the items for which data are being collected. Again, the analysis questions determine what data will be collected and structure the analysis. After data are collected from the incident reports, the data must be automated for analysis. Many police agencies use database software programs to store data collected from incident reports. This information can then be combined and analyzed with the other automated data on these incidents.

If departmental resources are low (although in many cases incident report review will not take as much effort as anticipated), a student from a local college or university may be able to assist the project as an intern or for independent study credits. Students can assist with data form development, data entry, and other administrative tasks.

Other Police Department Data

There is often a tendency to confine analysis to the most common and most familiar police agency data: incidents, arrests, and calls for service. However, other data sources can be quite useful. For an analysis of auto thefts in a particular area, for example, it is often helpful to review field interview (FI) records to determine if there are individuals or groups

that frequent this area. In addition, these data may be of assistance on problems of drugs, loitering, or other "quality of life" concerns.

Specialized databases within the agency, such as property records or firearms seizures, may be of use. For example, for an auto theft problem, analyzing the locations where stolen vehicles are recovered may help determine if there are common drop points or other similarities among the recovery locations.

Designing and Conducting Surveys

Surveys have many uses and are a relatively low-cost option for obtaining problem-solving information. Surveys allow a broad range of individuals and groups to provide input on the problem-solving activities. This section highlights some experiences encountered by departments conducting problem-solving. For greater detail regarding survey administration, design, and respondent selection, see *A Police Guide To Surveying Citizens and Their Environment* (Bureau of Justice Assistance, 1993). Surveys used in police problem-solving typically focus on victims, law enforcement officers, or community residents.

Victim surveys can document actions taken by the victim before and after the offense:

- Did victims of auto theft lock their cars or park in lighted areas?
- What other actions have residents reporting loitering taken to address the problem?
- How many times have they called the police?
- Who else is affected by the problem, and what do they view as potential reasons for the problem?

Surveys of law enforcement can be used to learn officers' perceptions of a problem, determine the extent to which they believe there is a problem, discover how the problem affects their work, and gain information on their previous responses to the problem. Officer surveys can accommodate differential shift assignments and situations where it is difficult to bring officers together. However, in cases where only a small group of officers are involved, it might be more efficient and effective to talk with them in person, either in an interview or focus group setting.

Perhaps the most common use of surveys is to obtain input from community residents, property and business owners, and managers. These surveys are typically used to obtain information regarding perceptions of the community, perceptions of and concerns about specific problems, and perceptions of previous responses to problems. In addition, community surveys often explore residents' participation in community organization, perceptions of the police, victimization experiences, and fear of crime. In working on a drug problem, obtaining neighborhood residents' views can be helpful in determining the following:

- Are the buyers and sellers from the neighborhood?
- When does the drug activity most often take place?
- How are residents affected by drug dealing?
- Are residents willing to work with the police, and are they afraid of reprisals if they do?
- What are the specific locations of drug dealing?
- What have residents done about the problem in the past?

Property owner surveys can identify management practices such as tenant screening, which may aggravate or alleviate the problem.

Surveys can also be used to collect baseline information to measure the effect of a response. For example, when determining if analysis-driven responses were effective, knowing if residents' perceptions of the problem have changed, if there is an awareness of the response, if the residents are satisfied with the response, and suggestions for further intervention may prove helpful. Such information might reveal the need for additional responses or indicate that analysis conclusions were wrong and need for further analysis. Because surveys can be so useful in both developing an understanding of the problem and determining the effectiveness of a response, it is important to consider how the administration, selected respondents, and design affect response rates.

Survey Administration

Surveys can be administered through the mail, over the phone, or in person. Each of these approaches has distinct advantages and disadvantages in terms of time, ease of administration, and response rates. Before administering any survey, steps should be taken to ensure the highest possible return rate. For all survey techniques, consider if the time of day, week, month, or year will affect the response rate.

The mail survey is one of the most common survey approaches; it is relatively inexpensive and easy to administer but frequently has low response rates. Low response rates can bias survey findings because the results might not accurately represent the population surveyed. For example, when

surveying residents about neighborhood problems, if the survey is administered during the day when most individuals at home are retirees, the results might not accurately represent those individuals not home during the day, such as teenagers or young adults, causing a bias in the respondent population. Publicity and follow-up postcards help reduce respondent bias and increase response rates; however, if these methods are used it is important that they have the potential to reach the entire group being surveyed. For instance, if a survey targets community perceptions of crime but is only publicized to churches, then disproportionate response rates might occur and skew the results.

Although telephone surveys are more expensive and require more organization, they tend to have higher response rates. Telephone surveys have the added advantages of including more open-ended questions and allowing the interviewer to clarify responses. Some departments have contracted with a university or research firm organized to conduct phone surveys but found it to be quite expensive. Other departments have assumed this responsibility and, for a more reasonable expense, organized a small, short-term phone bank of community residents, senior volunteers, or college students trained to conduct the interviews.

A third option to consider is face-to-face interviews. In this format, an interviewer would contact the potential respondent and interview them in person. Most often this would involve going to the resident's home. In many cases this can produce very high response rates, on the other hand some residents are hesitant to talk to someone who comes to their house. This approach has been used successfully by some departments who have had community residents conduct interviews in their neighborhood. In using either a phone survey or a personal contact interview, it is important that significant time be devoted to training of the interviewers.

Telephone surveys and face-to-face interviews require greater investments in organization and training, but improved response rates and quality of information make the investments worthwhile.

Selecting Survey Respondents

Careful thought must be given to selecting survey respondents. Unfortunately, in many cases, survey respondents are selected in a nonsystematic or haphazard way. Distributing surveys at community meetings, malls, or on the street might appear to increase the number of potential respondents; however, such unsystematic approaches have several implications. For example, the population and the actual number of surveys distributed are uncertain, and some individuals might receive multiple surveys whereas others are excluded.

Random sampling is based on the assumption that every potential respondent has an equal chance of being selected and thus will produce the most representative sample. The difference between random sampling and unsystematically surveying mall shoppers is that everyone does not have an equal chance of going to the mall at the particular time of survey distribution. In random sampling, all potential respondents are assigned a number and chosen through selected intervals or a common computer random number selection program. See *A Police Guide To Surveying Citizens and Their Environment* (Bureau of Justice Assistance, 1993) for further discussion of sampling issues such as sample size.

In some cases individuals might be selected for participation based on their particular knowledge, position, or responsibilities. For example, you may want to target block

watch leaders or business owners. This is known as a *purposive sample* and it is highly useful for ensuring that input is obtained from certain individuals. In presenting results, the source of the information must be documented to show it is not a representative group.

Many departments hire trained individuals or obtain assistance from a local university to help select survey respondents. Student interns may volunteer to gain university credit for the assistance they provide. In these instances, be aware of and acknowledge potential methodological biases when selecting respondents.

Survey Design

Many issues must be considered in designing a survey; many books have been written solely on this topic. A few of the most important issues to consider and some helpful hints are discussed in the following sections. For additional information on survey design, see *Survey Questions: Handcrafting the Standardized Questionnaire* (Converse and Presser, 1986) and *Improving Survey Questions: Design and Evaluation* (Fowler, 1995).

Keep it simple. Surveys should be straightforward and simple. Complex surveys confuse respondents and often lead to unintended responses. Complicated skip patterns (e.g. If the answer to number 3 is "no," skip to question number 10), may contribute to poor quality and quantity of responses. If such skip patterns must be used, then arrows on the survey itself can be used to guide the respondent.

Clear instructions for completing and returning the survey should be provided. Simple boxes to check off answers can be very helpful for respondents completing the survey.

Similar questions both in substance and in style should be grouped together. For example, questions regarding neighborhood appearance should not be grouped with citizen perceptions of police, nor should true-false questions be mixed with questions requiring strongly agree-strongly disagree answers.

Clearly explain the purpose of the survey. A short introductory section that clearly and briefly explains the purpose of the survey and how the survey results will be used will encourage individuals to respond. A cover letter of support from a relevant sponsor is also often helpful. In some cases a letter from the police department may be helpful, while in other communities this may lead to biased responses.

Keep it to a reasonable length. The length of time required to complete a survey is one of the biggest deterrents to survey return. Each question added to the survey increases the potential that the survey will not be returned. Mail surveys are most vulnerable to this problem. Although there are no hard and fast rules regarding length, keep surveys as short as possible but still ask for the critical information. Surveys with the highest response rate are usually confined to a few pages and focus on something the respondents care about. Crime related to respondents or in their community is a more likely time investment than a more general survey.

Ask what you need to know and make each question count. Although adding questions may harm the response rate, asking too few questions will result in the survey missing important information. Each question on the survey should relate back to the issues raised in the analysis questions. Items should not be included in the survey just because it might be interesting to know a particular fact. Survey questions should focus on better understanding the problem and exploring issues related to potential responses.

Ask specific questions. Information gained from specific questions will be more useful than responses to very general questions. For example, asking officers how often they encounter drug dealers on their beat is more helpful than a general question asking if drug dealing occurs on their beat.

Ask only one question at a time. Survey questions such as "Are crime and violence a problem in your neighborhood?" are really two questions in one. If crime is a problem but not violence, the respondent must answer "no" because both crime and violence are not a problem. After the survey is completed, review each question to be certain that the respondent is being asked about only one thing in each item.

Make questions value neutral. Questions should be constructed so that a preferred response is not implied. Asking if the respondent agrees with the police chief's recent statement that drugs are the cause of violence may elicit certain responses simply because the chief of police made the statement.

Ask respondents questions to which they know the answers. Survey questions should ask about the characteristics, experiences, attitudes, and perceptions of the respondents. Questions should be focused on the problem and potential responses. Questions such as "Do you believe drug treatment is effective in reducing recidivism?" are generally beyond the range of the respondent's knowledge. This item might be interesting but will have little relevance for responses.

Provide time period for reference. Surveys often explore the experiences of respondents with questions such as: have you been the victim of a crime, have you been to a community meeting, have you had interaction with the police? These are all questions about activities that happen over time. Without a reference point respondents will respond to whether

these things have ever happened. Most likely, however, the analysis team wants to know if these have happened within a particular time period (e.g. last month, within the last year). Thus, questions should be phrased with an appropriate reference period. If this question will be used for comparison during the assessment phase, the same time period should be used in both surveys (e.g. during the last year). Reference points also help respondents remember exactly when certain events occurred. Surveys in schools could use timeframes such as the beginning of the semester or since the summer break.

Be aware of closed- and open-ended questions. Closed-ended questions provide the respondent with all of the response options. Open-ended questions require the respondent to answer a question in his or her own words. Open-ended questions allow respondents to more fully explain their answers and describe their experiences. Although these questions provide more detail than closed-ended questions, most respondents are reluctant to spend the time required to respond. Open-ended questions create difficulties in the interpretation and coding of the responses, in addition to requiring extra resources for these tasks. Thus, the use of open-ended questions should be limited. Open-ended questions are more appropriate if the principal response options cannot be determined. If some open-ended questions are necessary, place them within a closed-ended survey to ensure that the best results are obtained.

Ask sensitive questions at the end of the survey. Sometimes surveys contain questions, such as income level, that respondents may be hesitant to answer. If these items are at the beginning of the survey some respondents may not complete the survey because of their reaction to these questions. Giving respondents a range of responses to choose from will often

increase response rates; rather than asking respondents to indicate their income, ask them to indicate if it was over or under certain levels or within certain ranges.

Phrase questions appropriately for the responding group. Surveys of high school youth should be worded differently than questions for problem-solving in areas with a large number of senior citizens. This does not mean that different forms of the survey are needed for different types of respondents. If, however, the entire responding group shares certain characteristics, make sure that the survey will translate to their experiences. This point also underscores the difficulty of simply taking a survey that was developed for one population or community and using it in another.

Pilot test the survey. After the survey instrument is designed, test it to obtain feedback on the content and design. Simply having others review it, particularly those similar to the potential respondents, will be helpful. Reviewers should be asked to comment on the clarity, usability, and length of the survey. Individuals providing feedback should have characteristics similar to the targeted respondents but not be in the sample (e.g. a resident outside the targeted neighborhood).

Focus Groups

An increasingly popular technique to obtain information for problem-solving is through focus groups. For detailed information regarding focus group formation, participant selection, and logistical considerations, see *Focus Groups: A Practical Guide for Applied Research* (Krueger, 1994). Focus groups are advantageous because they are easy to organize,

economical, and provide information in a reasonably short period of time. However, the apparent simplicity of the focus group technique has lead to its misuse. In popular usage, many individuals refer to any group meeting or multiple-person interview as a focus group. Rather, the focus group technique has definite procedures and processes that should be followed.

Formation of Groups

Effective focus groups engage individuals with a common trait that is believed to be relevant to the topic (e.g. youth, teachers, victims). Too frequently, focus groups are not structured and do not include individuals with common interests and, therefore, are unreliable and ineffective. When obtaining feedback about community problems, it might be necessary to conduct separate focus groups for each population affected by the problem, such as senior citizens, teenagers, young couples, single parents, and business owners. Groups should represent the breadth of interests in the community and include those affected by or dealing with the problem. For example, there might be one focus group of members in a community organization and another group of residents who do not belong to this organization. Although more difficult because they require more care, victim or offender focus groups can also be helpful.

Focus Group Questions

The focus group's emphasis is to obtain perspectives and discover the group's reactions to certain issues. It is often productive to list expected topics for the focus group in a discussion guide. Focus group questions are intended to be a stimulus and, like survey questions, should be nonjudgmental and not lead the response. The questions should be the same

for each population involved in focus group discussions, with possibly some specific follow-up questions designed for each group. Many departments obtain training or hire individuals with experience in facilitating and narrowing discussions to ensure best results from their focus groups.

Starting off with a broad question such as "What are the principal problems in the community?" is often helpful because it gives a broad overview of the participants' familiarity with the problem and often generates many responses. However, many responses will not be relevant to the problem being analyzed (e.g. unemployment). The discussion should then be narrowed through a more specific question about potential problems (e.g. Is drug dealing a problem in your neighborhood?). Specific follow-up questions should be included to clarify what constitutes the problem and what effect it has on focus group participants (e.g. What problems does drug dealing in your neighborhood create for you?).

Logistics of Conducting a Focus Group

Careful planning is necessary to conduct a productive focus group. Ironically, many focus groups lack focus. Group meetings often deteriorate to a freeform group discussion without actually addressing the topics at hand. Therefore, it is helpful to have an experienced group facilitator capable of leading a discussion related to police problem analysis. This individual should be informed of the desired outcomes of the problem analysis discussion, have the ability to keep the group on task, make sure that all individuals have a chance to express their opinions, and ensure that responses are obtained to all important questions.

To facilitate this process and ensure uniformity across all groups, a formal list of questions should be generated for focus group discussion. These questions should flow directly from the analysis questions developed early in the project. An agenda should be developed that lays out the progression of the questions and topics to be discussed.

The group should be kept to a manageable size to ensure that all participants have an opportunity to participate and maintain the focus of the discussion. In most cases, this will be 8 to 10 participants.

Providing participants with participation incentives beyond their general civic interest is often helpful. Similar to surveys, poor response rates or disproportionate participant selection can bias focus group outcomes. If 10 people are invited to participate and only three show up, those who participate are likely to be different from those who do not. Some departments provide a nominal cash incentive (e.g. $25) or a meal to encourage focus group participation.

Be conscious of potential selection bias; do not simply handpick respondents because they are familiar. Having different focus groups representing different interests might reduce this problem. In some cases, a random selection process can be used to select participants for the group. In other situations, a more purposive selection procedure is appropriate because individuals are chosen for their specific knowledge or position.

To ensure that the entire group's concerns and opinions are captured, formal records of the focus group discussion should be kept. Having two individuals with this responsibility would provide a more accurate representation of the group's responses; at the very least one person should be responsible

for taking notes. Although it might require a considerable amount of time and money, another option is to record the session and have it transcribed.

Focus groups should not be used instead of surveys and should not be interpreted as equal to surveys. Focus groups provide an in-depth exploration of the issues and problems but are limited by the number of participants and may not be a representative sample. A combination of focus groups and surveys is more likely to produce information that is representative of the entire population as well as provide detailed information that is particularly useful in crafting meaningful responses.

For a more detailed discussion on the use of focus groups, see *Focus Groups: A Practical Guide for Applied Research*, (Krueger, 1994).

Interviews

Interviews are a valuable problem analysis tool because they allow respondents to provide their perspectives of the problem and allow the interviewer to explore issues in greater detail and clarify responses. This technique is particularly appropriate when seeking information from victims and offenders.

Sample Offender Interview Questions:

- Why were specific houses chosen for burglary?
- Why were particular cars stolen?
- What did the offender find desirable about the physical condition of the offense location?
- Why was the offender in a neighborhood other than his or her own?
- Was the offense planned?

Offender interviews provide the opportunity to explore motivations for the offense and rationale behind target selection. This information can lead to valuable analysis findings and guide response selection. Interview questions should flow from the questions generated in the early stages of the analysis process, complement analysis goals, and ensure analysis-driven response selection.

When planning the offender interviews, expect and plan accordingly for challenges associated with the process. During the planning phase, consider the number of offender interviewees needed, how the offender's position in the judicial process might affect his or her responses, and how the interviewer might affect the outcome of the interviews. For example, it might be difficult to obtain enough interviewees from the same target area, particularly if the interview is conducted after disposition. If offenders are interviewed before disposition, they might be reluctant to talk or there could be legal issues that may inhibit this approach. If post-disposition interviews are conducted, it could be difficult to locate offenders and arrange for an interview.

One option is to interview offenders at a local correctional facility or through the probation office. Another option is to conduct jail interviews with offenders whose motivations and preferred target criteria are less likely to vary across jurisdictions (e.g. drug offenders). It might be less productive to interview individuals on parole, because their physical condition or motivation may have changed while they were in prison. Adding questions to detective's investigation questionnaires might be helpful; however, the effectiveness of this procedure may depend on the interviewees' willingness to speak freely to law enforcement and their place in the disposition process. Consequently, many agencies use non-law enforcement staff, such as students or other volunteers to conduct interviews.

Environmental Surveys

Environmental surveys are often useful problem-solving tools for understanding the "location" side of the crime triangle. There is a growing recognition that certain places have aspects that make them more "crime prone" and contribute to the problem. In addition, offenders use physical characteristics of a neighborhood as indicators of neighborhood organization, community cohesion, and community tolerance. Environmental analysis can reveal physical factors facilitating criminal behavior and provide focal points for the response. Altering the physical structure of a location to inhibit criminal behavior is often referred to as "crime prevention through environmental design" (CPTED).

Environmental surveys help determine what characteristics of the environment contribute to the problem and how such characteristics can be altered to resolve the problem as well as reveal previous changes that may have made a location less vulnerable to, or inhibited, crime. Conducting an environmental survey is straightforward; generally a checklist is developed to measure important characteristics of the area such as types of structures, lighting, access patterns, conditions of buildings and surrounding areas, street configuration, and building use (commercial, residential, etc.). Although environmental surveys are not complex, having someone with CPTED training involved in the construction of the survey document is helpful. For several excellent examples of environmental surveys, *A Police Guide To Surveying Citizens and Their Environment*, (Bureau of Justice Assistance, 1993) and *Crime Prevention Through Environmental Design*, (Crowe, 2000).

Examples of environmental survey findings include discovering a relationship between poor lighting, overgrown shrubbery, and abandoned vehicles that facilitate drug dealing. Similarly, apartment buildings with multiple access points may be more vulnerable for burglary given the easy ways in and out of these structures. Or the physical structure of an area may make the location particularly attractive for loitering. Using CPTED expertise to understand how and why the physical structure of an area contributes to a problem is a valuable tool for problem-resolution as well as prevention. This expertise can be used for engineering and landscaping buildings to ensure that the original design does not facilitate criminal behavior.

In addition to environmental surveys, before and after photographs can also capture the environmental conditions. This simple resource also helps demonstrate and prove the effectiveness of a problem-solving effort.

Observations

A number of police departments used observations to understand their problem and aid response development. To present the nature of the drug problem and demonstrate how it changed after the response, residents of one neighborhood organized themselves to record specific activities at specific locations in their community. In one department, residents videotaped activities at several locations. In another department, patrol officers completed surveys of what was taking place during observations at specified times.

Just like the other analysis tools, observations must be systematic to avoid biased and unreliable data. Two aspects of every observation must be carefully structured: when observations take place and what is observed. Observations

must be conducted at specific times to document how the nature of the problem changes. Observations should be done at different times of the day and days of the week so location activity is completely represented. In addition, a data collection form should be created to facilitate structure and make sure all observers appropriately document activity. Without this structure, one individual may pick up on different things than other observers even if there is no difference in activity. The form should specify the important aspects of the observation, such as the number of individuals, their appearance, their perceived ages, and a description of their activities. If other activities should be documented, such as traffic patterns, the procedure for this should be explained.

As is the case with all analysis techniques, the key to making observations productive is that they be done systematically. Haphazard observations will produce biased and unreliable information.

Mapping

Police department use of computer mapping continues to grow. In many departments, it has become a fixture around which crime analysis and problem-solving activities are organized. The use of computer mapping typically follows a progression of stages. For many years law enforcement agencies generated pin maps to indicate and track the location of crime incidents. Many agencies begin at this stage, using maps to display the location of incidents within certain time periods. These maps are often posted on briefing room walls as computer generated pin maps. A second stage involves using crime maps for dissemination of information to community groups; these maps could also have limited operational uses. Departments in this stage may produce maps to point out hotspots that may influence deployment. The

third stage consists of using crime mapping as an analytical tool that is integrated with problem identification but also with problem-solving. Once a pattern is observed through mapping, questions are asked (as in problem-solving) about how this pattern can be explained. Additional maps are then generated indicating the relationship of other factors with the crime location data. This third stage is the ideal use of computer mapping and involves integrating crime mapping with both strategic and tactical police operations.

Although mapping can be a powerful tool, the simplistic nature of mapping frequently leads to poor quality maps with little utility. Despite this drawback, mapping allows for spatial representation that may not be apparent though raw data. Similarly, mapping may reveal patterns in those areas crossing district boundaries that would not be apparent from analyzing a single district. Although the display of incidents on a map may create a nice picture, the thinking that goes into the analysis that the map represents is what counts.

Medical researchers often investigate the variation in rates of disease or illness across different jurisdictions (e.g. countries, states, cities, etc.). When comparatively high or low rates are found, they ask, "What is it about the lifestyle, environment, or other conditions that cause or contribute to this high or low rate?" This is exactly the problem-solving process to follow in policing. After the scanning phase, in which the problem is identified (high or low rate), analysis questions are posed to discover what is producing this rate. That is, once a map helps us identify the problem, how do we explain why this particular area has this level of criminal incidents?

Applications of Mapping

The applications of mapping are limited only by imagination. From simple maps of drug hotspots, burglary locations, and other crime locations, many agencies began constructing and using maps for problem-solving that depict relationships among various locations. Maps can be constructed to show how drug hotspots change over time. Other agencies use maps to show the residences of drug dealers compared with where they are arrested. In a very creative approach, some agencies have plotted the location of recovered stolen vehicles and the addresses of those on probation for auto theft. Other departments have mapped the location of street lighting and burglary locations. Home ownership and burglary have also been mapped. A number of departments use mapping to depict drug arrests and school locations. Nuisance abatement actions have been mapped along with drug arrests. Other examples of creative mapping include the addresses of sex offenders and school locations, non-owner-occupied housing and calls for service, and substandard housing and calls for service. Each of these examples demonstrates an explicit analysis and question that the map was designed to address. (For a comprehensive discussion of mapping and mapping applications, see *Mapping Crime: Principle and Practice*, Keith Harries, National Institute of Justice, 1999).

Issues To Consider

Data availability and accuracy. Data problems and inaccuracies can hinder effective problem identification and analysis. Before mapping data, reviewing sources for completeness and accuracy is essential. See *Geocoding in Law Enforcement, Final Report*, The Crime Mapping Laboratory, (Police Foundation, August 2000).

Type of map. The two most frequently used maps for criminal justice applications are the point map and the area map. The point map depicts the specific location of crime events, or other items of interest (e.g. schools, pay phones, liquor licenses). At times, however, this level of detail may be unnecessary and even overwhelming. Maps used for planning or administrative purposes rarely require that events be presented at the address level. Instead, area maps showing the numbers of incidents in particular areas (e.g. beats, districts, neighborhoods, and census tracts) would be more beneficial.

Map elements. The elements of the map (e.g. title, scale, and orientation) should be contingent on the targeted audience and intended use of the map. Most importantly, each map should include a legend that interprets the symbols and colors on the map.

Simplicity is best. Maps should be used to clarify, not confuse. A map's representation of the data should jump off the page, not require a lot of effort to understand what is being displayed. Too much information on one map will be confusing, and too many colors will be distracting. Similarly, having too many data points on the map will make it less meaningful. Too large a scale or area being depicted can also be confusing. Thus, it is important to consider how the size of a scale and the size of the area might distort the meaning of the data.

Categories for mapping. Maps should present analysis data in a meaningful and accurate way so that information is not distorted. The time period, the category range of values, and the area size are all critical issues of map presentation. Each of these factors will influence the number of points to be presented on the map. For example, given the large number of incidents, mapping the location of drug arrests in a city for the past 10 years would likely produce a meaningless map.

Other Data Sources

The previous sections discuss a considerable number of problem-solving tools involving many different data sources. Each particular problem requires individual analysis and will determine the most suitable data sources. All too often we rely on easily obtainable police department data and forget about other potentially relevant data sources. Other data that have often proven valuable for problem-solving include data from tax records, housing agencies, probation records, parole records, public heath records, hospital records, school data, and treatment program records. Although the mainstays of analysis will always be crime-focused data, these other sources should be explored when applicable because they can help explain factors related to the problem.

Other Issues to Consider in Analysis

There are other analysis issues to consider in addition to generating useful questions, determining the order of analysis activities, and identifying tools for analysis. The following section discusses the role of the community partner in analysis, reporting analysis results, and the transition from analysis into response.

Role of Community Partners in Analysis

Problem-solving programs have the greatest potential for success if those who are directly affected by the problem have an active role in the problem-solving process. The need and role of community partners will vary according to the problem and the community. It is important, however, to ensure that the community partners approach each task for which they are involved objectively.

When identifying community partners and roles, the first task is to determine the affected community. For many problems the affected community is the entire neighborhood. However, in some cases it may include only a subset of a community, such as youth. In other situations, the principally affected community may be business owners or managers. For a domestic violence problem, the community may consist of domestic violence victims and service providers. The affected community in an auto theft problem could be insurance companies. In a juvenile loitering problem, the affected community may include neighborhood residents, business owners, and the youth themselves. In every case, the point is to identify the relevant community and stakeholders and get them involved in the analysis process early in the project.

The community should be involved in each stage of the problem-solving process, including the analysis, unless involvement might jeopardize the objectivity and productivity of the problem-solving project. However, as with the police, community residents and other stakeholders have difficulty understanding why analysis is important. Many individuals feel that, because they are confronted with these problems daily, they are quite familiar with them, there is no need for further study, and it's time to go directly to responses. There can be resistance to conducting a community survey for similar reasons. This reluctance to conduct analysis, however, can be overcome by working with a small group of the affected community members to develop a mutual understanding of the importance of the analysis process.

Members of the affected community can participate in the analysis in a number of ways. In many situations it can be helpful to have community members participate in the development of analysis questions, gather data, conduct surveys (either on the phone or in person) and conduct observations of activities in the neighborhood that are related to the problem. At the conclusion of analysis, community members can also help interpret the findings to see what they mean for their community.

Despite the importance of these relationships, partnering with community members also can impede analysis and problem-solving. Partnerships are often challenged by unclear roles among participants, internal or external organizational conflicts, competing priorities, political pressures, and limited resources. Involving the right partner *at the right time* can reduce such challenges. The most effective partnerships are those that are properly planned and managed.

Reporting Analysis Results

Many agencies express difficulty in reporting the meaning of
analysis data as well as collecting the data. Analysis data must
be interpreted into findings; therefore, individuals capable of
making such interpretations must be included in the analysis
team. The findings from analysis must be summarized so they
make sense to both the analysis team and those working on
the problem. This summary should simply tell the story of
the problem and what analysis efforts revealed. It does not
need to be a lengthy report. In addition to revealing findings,
the analysis can help clarify what is related to the problem
as well as provide direction for response selection and
implementation.

The structure of the analysis summary should follow the
analysis questions, further supporting the need for clear,
relevant analysis questions and outlines. The analysis questions
facilitate reporting the analysis findings.

Transition to Response

The transition from analysis to response is perhaps the most
difficult aspect of the problem-solving process because
there is nothing automatic about it. At the conclusion of the
analysis, the problem-solver may be more confused than at
the beginning of the process. This is not necessarily a sign
of a failed analysis but may instead reflect the complexity
of the problem that is being addressed. When transitioning
into response, evaluate the original objectives of the project
and refine the objectives based on analysis findings. A good
analysis will improve the understanding of the problem and
the factors contributing to the problem.

As noted previously, well-structured analysis questions can provide a road map for drawing conclusions from the analysis. In turn, these conclusions should be used when identifying responses. Without a comprehensive set of analysis questions, reaching appropriate conclusions will be much more difficult and the transition to effective responses will be unlikely.

At the conclusion of analysis, a meeting of the project team could be held to discuss what has been learned. Before transitioning into response, the analysis team should be able to report on:

- the most significant findings from the analysis
- what is known now that was not known before
- whether different aspects of the analysis produced contradictory findings
- the principal contributing factors to the problem that have been discovered through the analysis.

After reporting these findings, the project team should discuss which responses are appropriate. This is the discussion that everyone has been waiting for since the project began. Realistically, the development of responses cannot take place exclusively in this meeting, but a range of potential responses can be identified and the beginning of a planning process established. Successful responses result not only from comprehensive analysis but also careful planning and implementation.

Summary and Challenges

The preceding sections of this guide have discussed various aspects of analysis for problem-solving and provided many suggestions about the technical aspects of conducting analysis. The principal theme of this guide is that sound analysis needs to be highly structured and conducted systematically. Haphazard data collection and analysis tend to produce haphazard results that will be difficult to interpret and of little use in designing effective responses.

A second theme of this guide is that successful analysis begins with a comprehensive listing of what needs to be known about the problem. Without a good set of analysis questions, the collection of meaningful data will be difficult and the formulation of appropriate conclusions and responses will be less likely. Stated more positively, if you establish a sound foundation for the analysis with a strong set of analysis questions, then the tasks of interpreting and summarizing the findings and transitioning to responses will be easier.

Although understanding the technical aspects of analysis is important, analysis is an art as well as a science, and the problem-solver is as much a craftsman as a technician. The craft of problem-solving requires creativity and the much-discussed ability to think outside the box. It means looking at problems and situations in new ways; involving individuals, groups, and organizations in a collective effort to analyze and address community problems and using nontraditional approaches to solve these problems. The problem-solver as craftsman uses the raw materials of analysis and collective action to build an effective response.

Thus, in addition to the systematic and comprehensive structure that is important for a sound analysis, it is equally important that effective problem-solvers be creative in their approach to analysis and response. As you will see, and perhaps already have learned, this is easier said than done. But with practice and perseverance you can conduct a meaningful analysis that will contribute to effective responses to problems in your community.

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Krueger, Richard (1994). *Focus Groups: A Practical Guide for Applied Research*. Thousand Oaks (California): Sage Publications.

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Sampson, Rana, and Michael S. Scott (2000). *Tackling Crime and Other Public Safety Problems*. Washington, D.C.: United States Department of Justice, Office of Community Oriented Policing Services.

Recommended Reading

Problem-Oriented Policing and Problem-Solving

Assessing Responses to Problems: An Introductory Guide for Police Problem Solvers, by John Eck, U.S. Department of Justice, Office of Community Oriented Policing Services (2001). Also available at www.cops.usdoj.gov.

Excellence in Problem-Oriented Policing: The 1999 Herman Goldstein Award Winners, National Institute of Justice, (2000). Also available at www.ojp.usdoj.gov/nij.

Problem-Oriented Policing, by Herman Goldstein, McGraw-Hill (1990), and Temple University Press (1990).

Problem-Oriented Policing: Reflections on the First 20 Years, by Michael S. Scott, U.S. Department of Justice, Office of Community Oriented Policing Services, (2001). Also available at www.cops.usdoj.gov.

Problem-Oriented Guides for Police Series, by U.S. Department of Justice, Office of Community Oriented Policing Services (2001). Also available at www.cops.usdoj.gov.

Problem-Solving Tips: A Guide to Reducing Crime and Disorder Through Problem-Solving Partnerships, by U.S. Department of Justice, Office of Community Oriented Policing Services (1998). Also available at www.cops.usdoj.gov.

Tackling Crime and Other Public-Safety Problems: Case Studies in Problem-Solving, by Rana Sampson and Michael S. Scott, U.S. Department of Justice, Office of Community Oriented Policing Services (2000). Also available at www.cops.usdoj.gov.

Information on Survey Development, Administration, and Design

Improving Survey Questions: Design and Evaluation, by Floyd Fowler, Sage Publications (1995).

A Police Guide to Surveying Citizens and Their Environment, by Bureau of Justice Assistance, Government Printing Office (1993).

Survey Questions: Handcrafting the Standardized Questionnaire, by Jean Converse and Stanley Presser (1986).

Focus Groups

Focus Groups: A Practical Guide for Applied Research, by Richard A. Krueger (1994).

Crime Prevention Through Environmental Design (CPTED)

Crime Prevention Through Environmental Design, by Timothy Crowe, National Crime Prevention Council (2000).

Designing Safer Communities: A Crime Prevention Through Environmental Design Handbook, National Crime Prevention Council (1997).

A Police Guide to Surveying Citizens and Their Environment, Bureau of Justice Assistance (1993).

Information on Mapping

Geocoding in Law Enforcement, Final Report, Police Foundation
(August, 2000). Available at www.policefoundation.org and
www.cops.usdoj.gov.

**Information Systems Technology Enhancement Project
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available at www.cops.usdoj.gov.

Mapping Crime: Principle and Practice, by Keith Harries,
National Institute of Justice (1999).

Crime Analysis

Beyond Bean Counting: New Approaches for Managing Crime
Data, by William Spelman (1987), Police Executive Research
Forum (1987).

Using Research: A Primer for Law Enforcement Managers, by
John Eck and Nancy LaVigne, Police Research Executive
Forum (1994).

For a bibliography of crime analysis resources see
www.iaca.net/resources.

Building and Sustaining Partnerships

A Citizen Guide to Community Policing, by National Crime
Prevention Council, Bureau of Justice Assistance (1998).

Helping Communities Mobilize Against Crime, Drugs, and Other
Problems, by National Crime Prevention Council, Bureau of
Justice Assistance (1992).

How Communities Can Bring Up Youth Free From Fear and Violence, by National Crime Prevention Council, Bureau of Justice Assistance (1995).

Uniting Communities Through Crime Prevention, by National Crime Prevention Council, Bureau of Justice Assistance (1994).

About the Author

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Timothy S. Bynum is a Professor in the School of Criminal Justice at Michigan State University and was formerly an Associate Director of the Institute for Public Policy and Social Research at Michigan State. Dr. Bynum is also the Director of the Michigan Justice Statistics Center. 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 a wide variety of national, state, and local research and evaluation projects. He has conducted research on gangs and gang enforcement, narcotics enforcement, firearms violence, and community policing. He has recently concluded a visiting fellowship with the Office of Community Oriented Policing that was the basis of this monograph. Further, he was a member of the research team for the national evaluation of the Youth Firearms Violence Initiative and the national evaluation of Weed and Seed. He was also a principal member of the Integrated System Technology Enhancement Project from the COPS Office. Dr. Bynum is currently the research partner for the Detroit Strategic Approaches to Community Safety Initiative (SACSI).

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