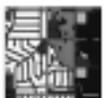


## Chapter 3: Maps That Speak to the Issues

This chapter discusses how map designs can address specific issues and audiences. The underlying assumption that “one map fits all” is inadequate because each audience has its own perspective on crime and how it can be prevented or controlled. Community leaders may have the latest notorious incident on their minds. Policymakers may be concerned about how to trim \$1 million–\$2 million from their budgets while making the community safer. Members of the court and corrections communities may be concerned with overloaded systems, overcrowding, and the ramifications of releasing offenders early. Investigators may need tools to help them organize place-related facts and processes. Police managers often worry about accountability, resource allocation, displacement problems, and the implications of demographic change. On the front lines where patrol and community officers operate, community information is a core resource rarely available in sufficient quantity or quality.

### Patrol officers

Officers who spend time on the street are entitled to the most up-to-date and comprehensive data related to their patrol areas. These data should be easily accessible and user friendly.







## Maps That Speak to the Issues

poorly defined lines will be relatively hard to read (figure 3.4).

## Investigators

The documented applications of mapping as a support tool for investigation suggest several generalizations applicable to the use of maps.

Maps:

- Bring together diverse pieces of information in a coherent way.
- Provide vivid visualizations of case-related data and descriptive patterns that may suggest answers to investigative questions.

- Provide opportunities for spatial analysis with selection and query tools. (See chapter 4.)

- Serve as tools to persuade managers to deploy resources in a specific manner.

A recurring theme is that maps often reveal a whole picture that is greater than the sum of its parts. This happens when many small and seemingly isolated and insignificant pieces of evidence take on critical importance when viewed as part of a pattern.

Without maps, data may be incomprehensible or available only in the form of a list. A list of suspects or pieces of physical evidence means little if key information is

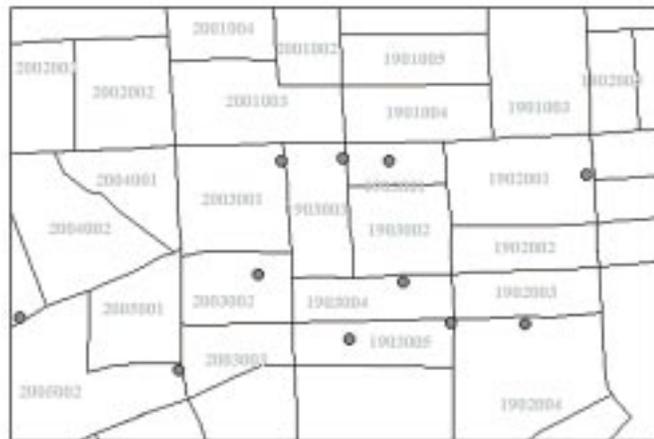
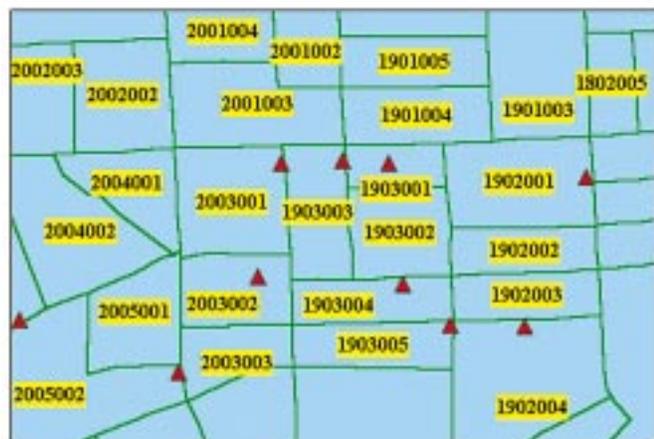


Figure 3.4

Contrasting maps, less legible (top) and more legible (bottom).

Source: Keith Harries.



seen best in graphic form. Even a list of addresses may be hopelessly confusing in a metropolitan area with thousands of streets.

These points are illustrated in several case studies outlined by La Vigne and Wartell (1998). In a McLean County, Illinois, case involving rural burglaries, for example, an inexpensive proprietary mapping program was used to plot incidents on a county map. Almost all incidents occurred close to major highways, suggesting the involvement of traveling criminal groups that specialized in burglaries. The burglaries also seemed to occur close to cemeteries, which were thought to be lookout places. Based on this information, more patrols were placed around cemeteries, leading to the arrest of persons belonging to a group called the Irish Travelers. Although there were no convictions, there was a sharp decline in burglaries in the region, suggesting that the group had been displaced (Wood, 1998).

In a Knoxville, Tennessee, rape case, ex-offenders living near a crime scene were mapped. Within 2 miles of the crime scene, there were 5 sex offenders, 15 parolees, and 2 juvenile habitual offenders. When additional offenses occurred, victims were able to identify the offender from the suspect group selected according to geographic proximity. The interpretation noted that “without the spatial analysis of the offender databases layered on top of the crime scene map, the offender information would not have been readily known” (Hubbs, 1998).

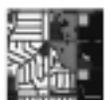
In Aurora, Colorado, the time and day of occurrence, location type, method of

break-in, and property characteristics of several burglaries were used to determine that the burglaries were geographically clustered. The events had taken place in the afternoon in single-family dwellings, and similar entry points and crime scene behaviors (including damaging property in the home) were evident. This information was distributed to the police department’s burglary unit and patrol bureau, which immediately identified and eventually apprehended a suspect whose home address was at the center of the observed cluster (Brown et al., 1998).

Other relevant case studies involved preparing murder trial evidence in St. Petersburg, Florida (see chapter 5); employing an autodialing system in Baltimore County, Maryland (see chapter 5); predicting serial crime in Los Angeles, California; and mapping evidence left by a murderer in Lowell, Massachusetts (see La Vigne and Wartell, 1998, for details of these and other cases).

## Police managers

Police managers are confronted with many challenges. Not only must they be aware of crime problems, but they also must be able to address problems involving labor relations, public relations, and political influences. The following are typical issues affecting police managers, which can be addressed by using mapping as a management tool. The five issues are analyzing calls for service (CFS), hot spot mapping, crime displacement, the implications of demographic change, and accountability as exemplified by the CompStat process in New York.



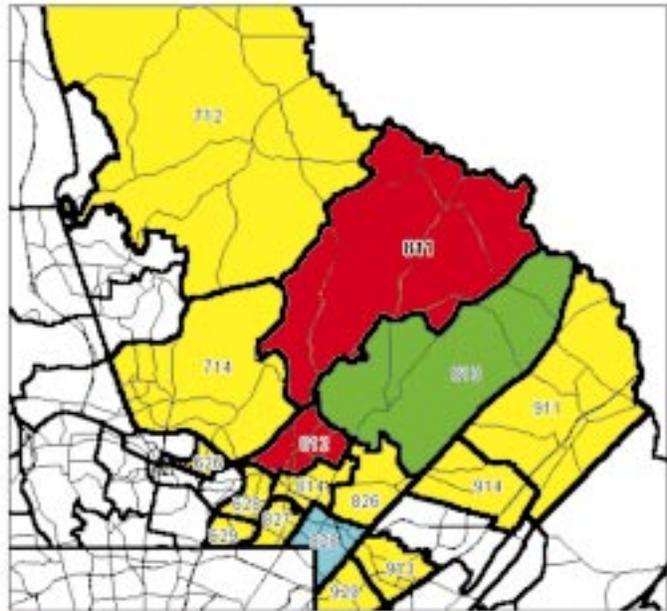
**Management issue 1:  
Mapping calls for service  
to assist resource allocation**

CFS are generally accepted as a crude index of the demand for police services. As such, they can be mapped. This process uses either point symbols (each symbol represents one or more calls) or choropleth form (calls are assigned to specific geographic or reporting areas). Although patrol officers find CFS maps help indicate “where the action is,” maps with greater detail are more useful.

CFS maps are most useful as a tool to help managers allocate resources. In Baltimore County, Maryland, for example, descriptive

data on the number of calls that various patrol units respond to are mapped (figure 3.5). This same police department then analyzes and “weights” the calls for service to designate or modify police “posts” or patrol areas. “Weight” in this context means that CFS involving more serious crimes are assigned higher values than CFS regarding less serious incidents. The weighted values are then totaled to indicate each post’s workload. As needed, post boundaries are drawn (or redrawn) to equalize the workload (figure 3.6). This is done using a MapInfo® redistricting routine, which was originally intended to help redraw political districts following each census. The objective of political

**GIS & Management:  
Resource Allocation**



**Figure 3.5**

A map showing descriptive data on patrol responses to calls for service.

*Source: Philip Canter, Baltimore County, Maryland, Police Department. Reproduced by permission.*

26.8% of all calls in Post 811 were handled by car 811. An additional 21.8% of Post 811 calls were handled by car 812, while car 813 handled 18.7% of Post 811. These 3 cars travel, on average, 4.2 miles to respond to calls in post 811. The average travel distance for all responding vehicles is 5.8 miles. \*\* Data for 1/1/98 - 2/13/98

**Legend**  
Number of Times Police Unit Responded to a call in post 811.  
Red: 97-128  
Green: 65-96  
Blue: 33-64  
Yellow: 1-37



redistricting is to maintain an equal number of residents in each political area to maintain the “one person, one vote” principle—a process analogous to equalizing incidents or workload per officer in the

police context (Canter, 1997). (See chapter 5 for another application of this method.)

Another example with implications for resource allocation is shown in figure 3.7,

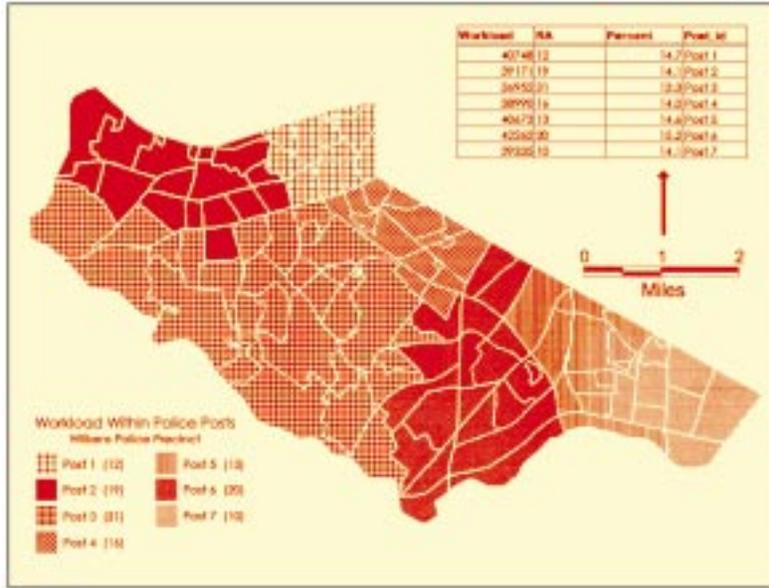


Figure 3.6

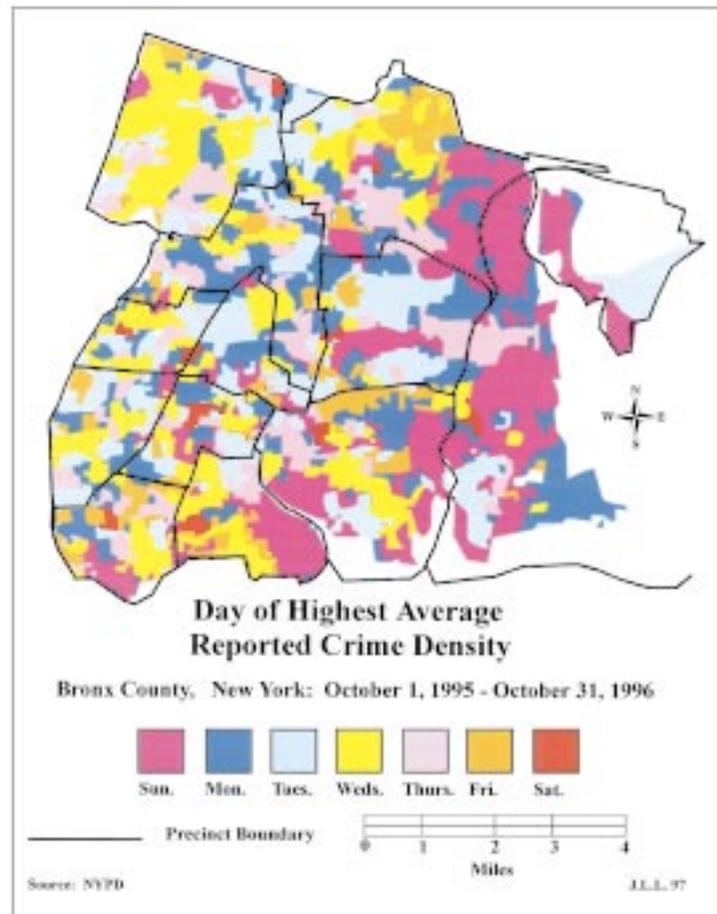
A map showing police posts based on workload assignments by reporting area.

Source: Canter, 1997, figure 4, p. 173.

Figure 3.7

A map showing the day with the highest average reported crime density, Bronx County, New York, October 1, 1995, to October 31, 1996.

Sources: Map by J. LeBeau, Southern Illinois University, with data from the New York City Police Department. Reproduced by permission.



## Maps That Speak to the Issues

which illustrates the day of the highest average reported crime density. In this case, point data were aggregated into more than 950 census block groups, and the number of crimes per day, per square mile for each block group, was calculated.

### Management issue 2: An approach to hot spot mapping

Hot spots are discussed in more detail in chapter 4. Here, we describe an application designed to identify specific locations for increased law enforcement activity and to help law enforcement managers solve problems. This method, developed by Eck, Gersh, and Taylor (in press), is called *repeat address mapping* (RAM). It defines a hot

spot as “a single place with many crimes.” The term “many crimes” is defined using *minimum plotting density*—meaning simply that a minimum number of events must occur in a specific place for it to qualify as a hot spot.

The hot spot designation procedure is illustrated in figure 3.8. The steps include:

- Sort places according to the number of crimes so that the place with the most crimes is at the bottom of the list and the place with the fewest is at the top.
- Divide the list into 10 equal sections, with the top group containing the fewest crimes.

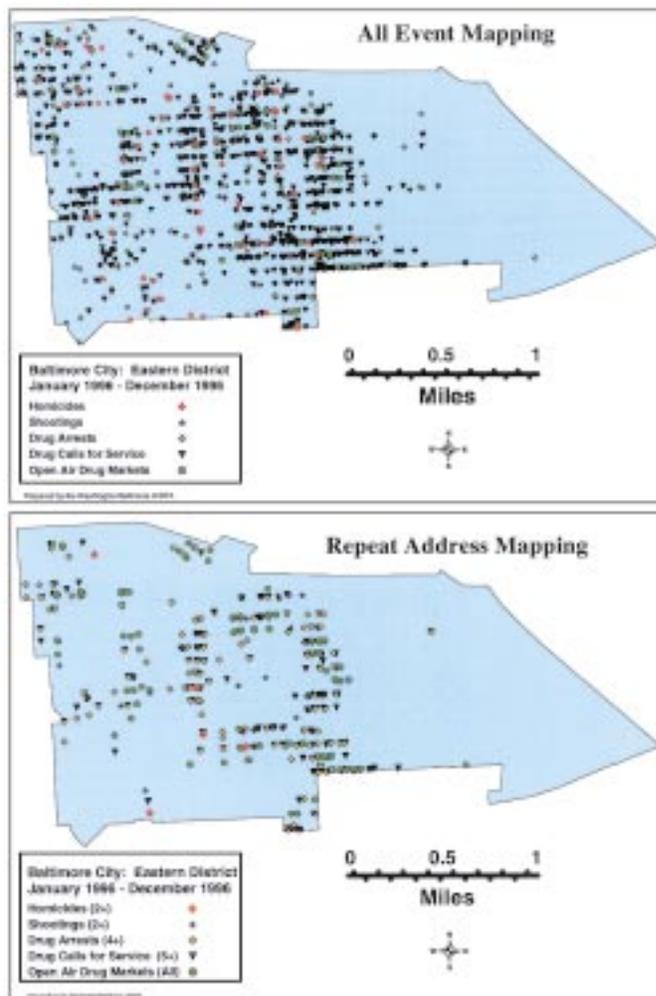


Figure 3.8

A map showing the RAM method applied to data for East Baltimore, Maryland. Note the distinctive difference between the pattern for “all event mapping” and the pattern for “repeat address mapping.”

Source: Eck, Gersh, and Taylor, in press. Reproduced by permission.



- Designate addresses within the bottom group as hot spots.

### Management issue 3: Mapping displacement

In general terms, displacement occurs when criminal behavior is replaced by some other behavior or moved from one place to another. *Spatial displacement* occurs when offenders move from one area to another in response to a law enforcement effort. A fundamental problem in the analysis of displacement is the natural and inherent conflict between the local and general benefits of crime prevention. For example, a crime hot spot is identified and a prevention program is put in place. This has the effect of chasing offenders out of the area, only to move them across the city, county, or State line. Thus the local problem has been solved (at least temporarily), but the net general gain is zero—and could be negative if the offenders are displaced to an area that is more vulnerable because of weaker law enforcement. Taking this line of reasoning to its logical conclusion, it could be said that preventing crime in one place causes crime in another!

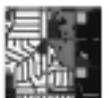
Barnes (1995) noted that the literature has identified six kinds of crime displacement:

- **Temporal.** Offenders perpetrate crimes at times seen as less risky.
- **Target.** Difficult targets are given up in favor of those easier to hit.
- **Spatial.** Offenders move from areas that may be targets of crime prevention programs to less protected areas.
- **Tactical.** Tactics are changed to get around security measures.
- **Perpetrator.** New offenders take the place of those who move, quit, or are apprehended.
- **Type of crime.** Offenders take up another type of crime if one type becomes too difficult to commit.

In theory, if perfect data were available, all six of these displacement types could be mapped. In practice, this is highly unlikely, and from the perspective of spatial analysis, spatial displacement is the prime candidate for mapping.

But mapping even spatial displacement alone is difficult due to measurement problems. Although it may seem simple enough to establish a law enforcement effort target area and a surrounding displacement area, measuring displacement there is, in reality, far more complex. The ability to measure displacement is also affected by the impact of the enforcement program, as well as the size of both the target area and the displacement zone and their existing crime levels.

For example, if the displacement area already has a high level of crime, the effects of the enforcement program could be indistinguishable from the normal variations in criminal incidents in the displacement zone. As shown in figure 3.9, the existing crime rate is a key factor in isolating crime displacement. Displacement would be difficult to identify in the top map. However, in an area with little existing crime, displacement may be obvious—or at least appear to be obvious (bottom map).



## Maps That Speak to the Issues

To suggest that spatial displacement analysis is too difficult to be viable is an exaggeration; managers and analysts should assess viability on a case-by-case basis. However, spatial displacement analysis is harder than one might think, and even a well-designed displacement study may need to hedge its conclusions (see Weisburd and Green, 1995; Reppetto, 1974; Hakim and Rengert, 1981; and Barr and Pease, 1990).

### Management issue 4: Demographic change and its implications for managers

A key fact affecting police department mapping is that some 26.3 million immigrants, about three times as many as in 1970, now live in the United States (Escobar, 1999). This 10 percent of the population is critically important to law enforcement, whose primary function requires interaction with the public. Although many communities may feel

**Figure 3.9**

Maps illustrating displacement. The dense pattern in the top map makes it difficult to detect displacement. There is no such problem in the bottom map.

*Source: Keith Harries.*



little effect (particularly those that are more isolated and rural), major metropolitan areas with many immigrants have experienced profound social change.

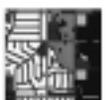
It is in such places that community policing takes on special significance. Not only are “traditional” minorities (primarily African-Americans and Hispanics) voicing their opinions, but relatively new groups, such as Bosnians, Dominicans, Russians, Koreans, and Vietnamese, are becoming more visible and politically articulate. Matters are further complicated by the fact that a specific national group, such as the Vietnamese, may not necessarily constitute an ethnic group. Vietnam, for example, has 53 ethnic groups, leading to potential stresses along ethnic lines.

Each group’s perceptions of what is legal or illegal may differ sharply from local norms. Opportunities for misunderstandings with law enforcement are rife, and community policing officers must understand the cultural values and practices of the groups they encounter. Language barriers mean:

- Citizen reports may be difficult or impossible to understand for officers who are unfamiliar with a language.
- Confusion and frustration over misunderstood reports may result in under-reporting of crime because persons who assume they will not be understood may stop reporting crimes.
- It is unlikely that first-generation immigrants will become police officers.

What does this have to do with crime mapping? Because police agencies need to know what is going on demographically in their communities to react appropriately, mapping demographics and related factors may translate into better community relations. *The Washington Post* published the article “When Fighting Crime Isn’t Enough: Fairfax, Montgomery [Counties] Seek Police Chiefs Adept at Community, Employee Relations” (Shear and Shaver, 1999). Surprisingly, perhaps, what was missing from the discussion about recruiting new chiefs was the crime issue. The debate was peppered with phrases such as “effective management,” “comfortable with changing demographics,” and “diversity.” Traffic generated more interest than burglary!

A basic need is mapping where the minority and immigrant groups are located. Are they scattered throughout the community or clustered in distinct areas? What are their institutions and facilities (e.g., churches and temples, community centers, and schools)? What are the issues of concern to communities and what are their locational attributes? A map such as the one in figure 3.10 shows how census data can be used to locate ethnic groups and determine the overall degree of ethnic diversity. Based on 1990 census data, the figure illustrates the relative evenness in the proportion of five ethnic groups in census tracts. The index varies between 1.0 (equal numbers of all groups, maximum diversity) and 0.0 (only one group in the tract, minimum diversity). The ethnic diversity map could be viewed as a model for achieving the same ethnic distribution



## Maps That Speak to the Issues

in the police departments serving various communities. A department does not match the community if it is less ethnically diverse than the area it serves.

Another possibility is to maintain a geographic inventory of minority and immigrant concerns so that managers can see what and where the issues are. Community leaders could be identified, perhaps by subareas of the larger ethnic community, to ensure that a contact person exists for each neighborhood. Mapping can also be used to show where second-generation minorities are reaching adulthood, enabling targeted police recruiting. The 2000 census will permit this type of analysis on the World Wide Web.

A major problem for demographic mapping is the lack of current population data. Until data from the 2000 census become available, alternative data sources are necessary. Analysts may have to improvise.

Field mapping may need to be done and communities delineated on the basis of visual checks, perhaps with the aid of a global positioning system (GPS). Other possible data sources include those on school enrollments, utility hookups, and building permits and inspections. Although not yet fully operational, another promising resource is the American Community Survey (visit Web site <http://www.census.gov>).

### Management issue 5: Accountability and New York's ComStat process<sup>1</sup>

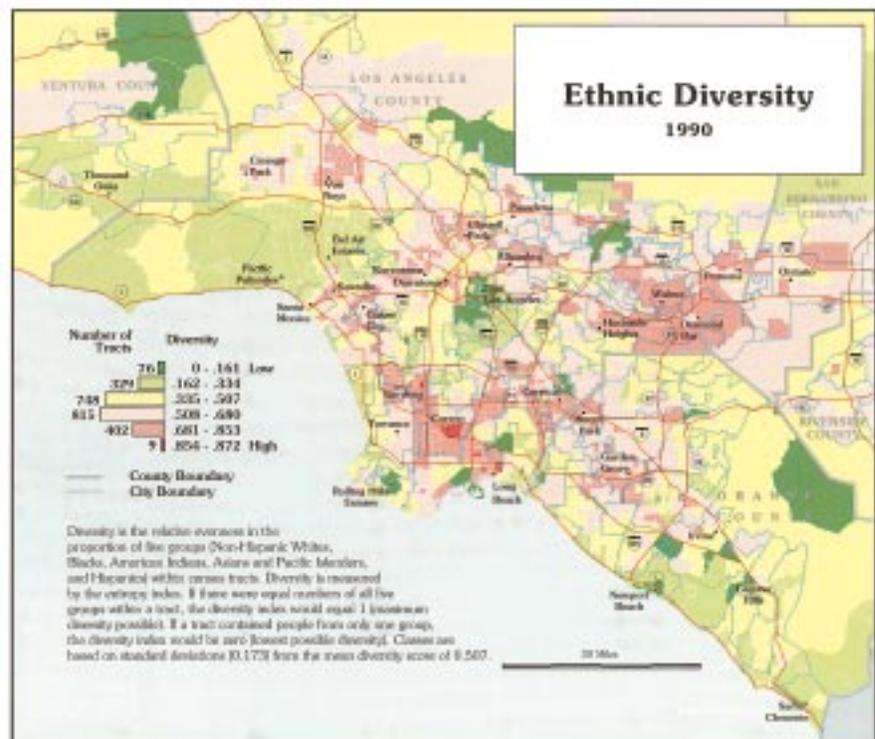
New York City's Computerized Statistics (ComStat) process was initiated in 1994 in the form of crime control strategy meetings. As a result of sharp declines in the city's crime, the system is now widely imitated. According to the police department, ComStat's objective is "to increase the flow of information between the agency's executives and the commanders

**Figure 3.10**

A map showing ethnic diversity in 1990, Los Angeles, California.

*Source: Allen and Turner, 1997.*

*Reproduced by permission.*



of operational units, with particular emphasis on the flow of crime and quality-of-life enforcement information.” Crime strategy meetings, held from 7 to 10 a.m. twice a week, are part of an “interactive management strategy” intended to improve accountability “while providing local commanders with considerable discretion and the resources necessary to properly manage their commands.” Precinct commanders present at the meetings twice a month.

The process format requires that precinct commanders appear before the ComStat meeting prepared to discuss crime and policing in their areas. A big-screen computer map shows the precinct under review. For example, a string of robberies with similar circumstances might lead to questions about known habits of robbery parolees living in the vicinity. As this conversation develops, a map showing relevant parolee addresses illustrates the discussion.

The crime reduction principles embodied in the ComStat process are:

- **Accurate and timely intelligence.** Information describing how and where crimes are committed, as well as who criminals are, must be available at all levels of policing.
- **Effective tactics.** Tactics are designed to respond directly to facts discovered during the intelligence gathering process. Tactics must be “comprehensive, flexible, and adaptable to the shifting crime trends we identify and monitor.”

- **Rapid deployment of personnel and resources.** Some problems may involve only patrol personnel, but “the most effective plans require that personnel from several units and enforcement functions work together as a team.”

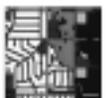
- **Relentless followup and assessment.** To ensure that appropriate outcomes occur, rigorous followup is necessary.

Underpinning ComStat crime reduction efforts are eight explicit police strategies:

- Getting guns off the streets.
- Curbing youth violence in schools and on the streets.
- Driving drug dealers out of the city.
- Breaking the cycle of domestic violence.
- Reclaiming public spaces.
- Reducing automobile-related crime.
- Rooting out corruption and building organizational integrity in the New York City Police Department.
- Reclaiming the streets of New York.

How does crime mapping fit in? The police department explains it like this:

Among the command and control center’s high-tech capabilities are computerized pin mapping and the capacity to display crime, arrest, and quality-of-life data in many formats, including comparative



## Maps That Speak to the Issues

charts, graphs, and tables. By using MapInfo software and other computer technology, the ComStat database can be used to create a precinct map depicting almost any combination of crime and/or arrest locations, crime hot spots, and other relevant information. These visual presentations are a highly effective complement to the ComStat report, since they permit precinct commanders and executive staff members to instantly identify and explore trends, patterns, and possible solutions for crime and quality-of-life problems.

A problem often overlooked in other police departments—crime patterns that overlap precincts—is addressed through an expectation that precinct commanders cooperate with other commanders to address issues of mutual concern. Typical ComStat

process maps are shown in figures 3.11–3.15.

## Maps in support of community oriented policing and problem oriented policing

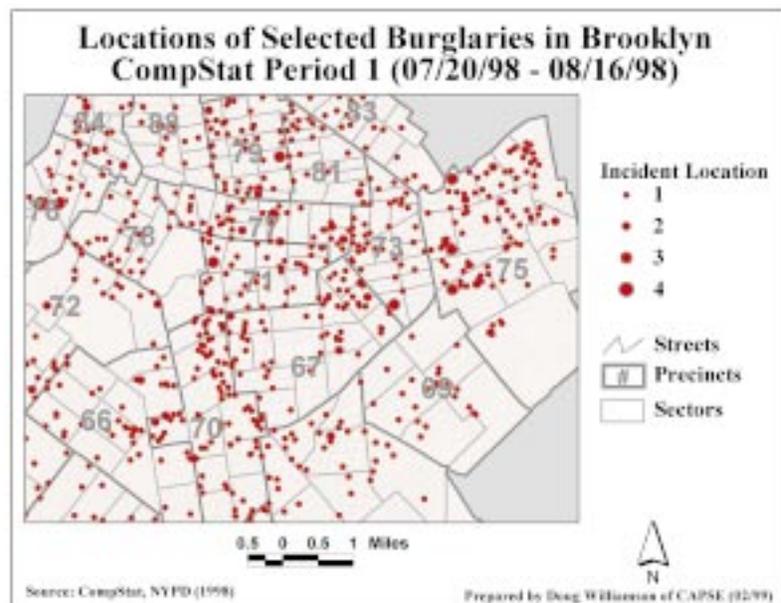
Three broad categories of maps can be used in support of community oriented policing (COP) and problem oriented policing (POP):

- **Crime and offender information.** This includes information about the times, locations, and types of offenses, repeated offenses, methods of offenders, property taken, points of entry, linking evidence, types of vehicles

**Figure 3.11**

A CompStat map showing locations of selected burglaries in Brooklyn, New York.

*Source: D. Williamson, Center for Applied Studies of the Environment, Hunter College, New York, and New York City Police Department. Reproduced by permission.*



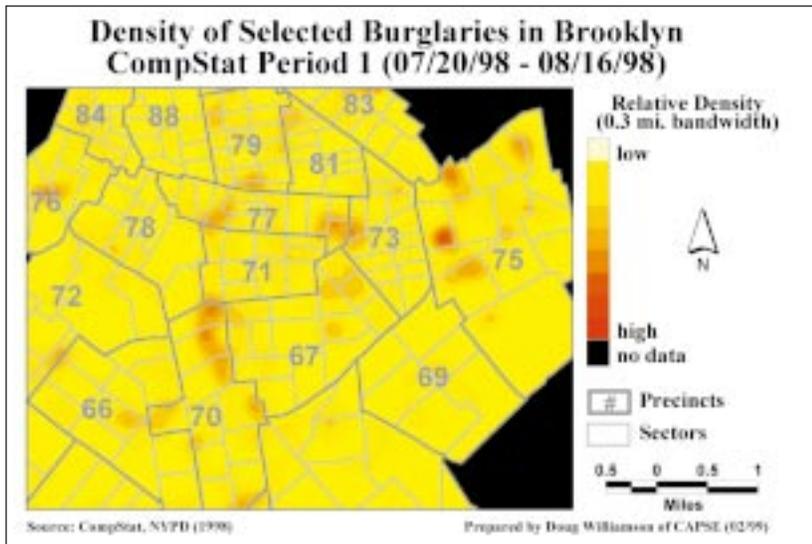


Figure 3.12

A CompStat map showing the density of selected burglaries in Brooklyn, New York.

Source: D. Williamson, Center for Applied Studies of the Environment, Hunter College, New York, and New York City Police Department. Reproduced by permission.

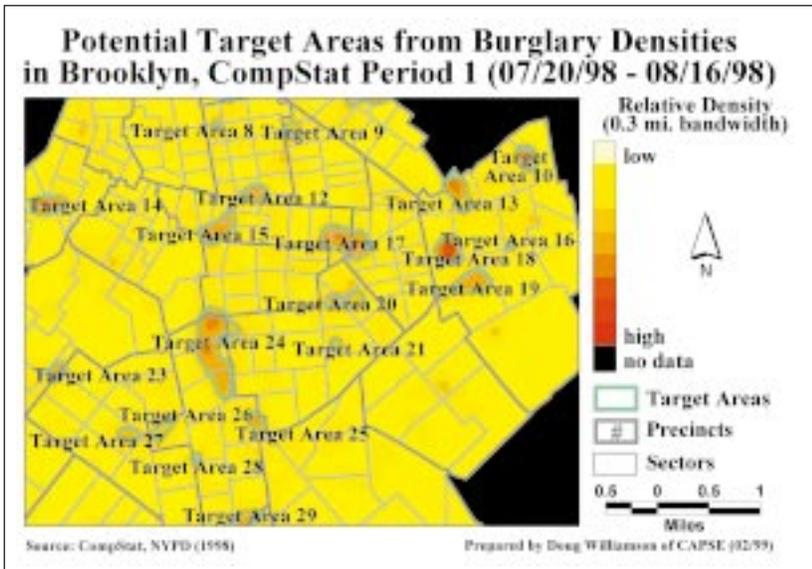


Figure 3.13

A CompStat map showing potential target areas from burglary densities in Brooklyn, New York.

Source: D. Williamson, Center for Applied Studies of the Environment, Hunter College, New York, and New York City Police Department. Reproduced by permission.

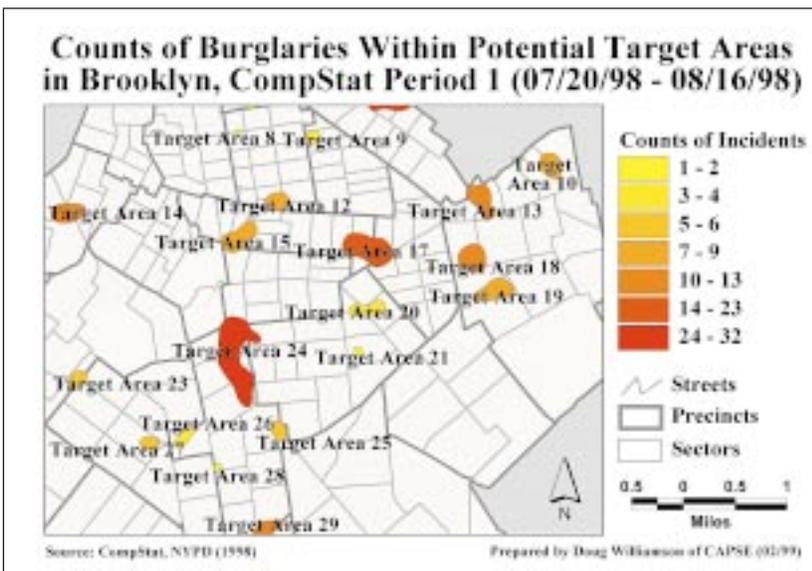


Figure 3.14

A CompStat map showing counts of burglaries within potential target areas in Brooklyn, New York.

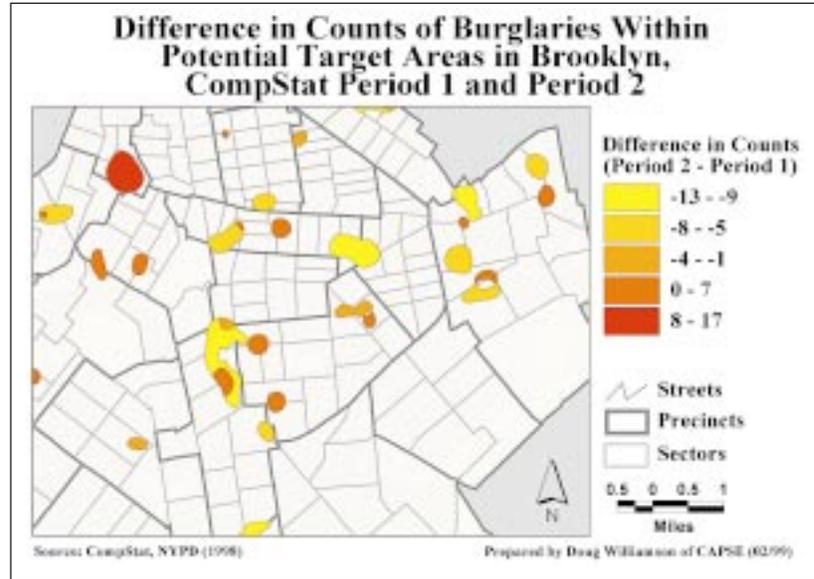
Source: D. Williamson, Center for Applied Studies of the Environment, Hunter College, New York, and New York City Police Department. Reproduced by permission.



**Figure 3.15**

A CompStat map showing differences in counts of burglaries within potential target areas in Brooklyn, New York.

*Source: D. Williamson, Center for Applied Studies of the Environment, Hunter College, New York, and New York City Police Department. Reproduced by permission.*



used, and suspect information, such as personal appearance and case status, which is also an aspect of accountability (figure 3.16).

- **Community and government resources.** These include information about neighborhood watch groups, storefront stations (figure 3.17), parolees, probationers, tax assessment and zoning laws, owner occupancy, utility data, patrol beats, building footprints (planimetrics), alarm customers, alley lighting, playgrounds, walls as barriers, afterschool programs, high social stress areas such as low-income housing, liquor stores, and crime hot spots.
- **Demographics.** These include information about population change, ethnicity, race, socioeconomic status (SES), the percentage of female-headed households with children, the age of housing, and the school-age population.

Extremely broad-based gearchives are very useful in COP and POP applications. Because it is impossible to predict what will be needed at any given moment, a reference-type archive is necessary. The ideal, noted in chapter 4, is an “enterprise” database that crosses departmental lines but remains accessible to all agencies.

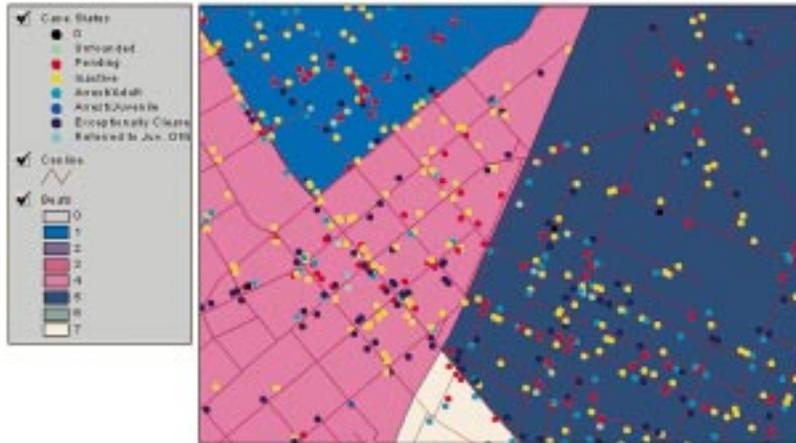
In addition, there is need for versatility and flexibility in map preparation. For example, line maps of streets will probably need to be superimposed over aerial photos, which demands that their coordinate systems match (for more information, see chapter 4).

### Maps and community policing: The city of Redlands, California, approach

Under the leadership of Police Chief James R. Bueermann, the city of Redlands, California, has transformed its current means of addressing neighborhood quality of life by consolidating housing, recre-



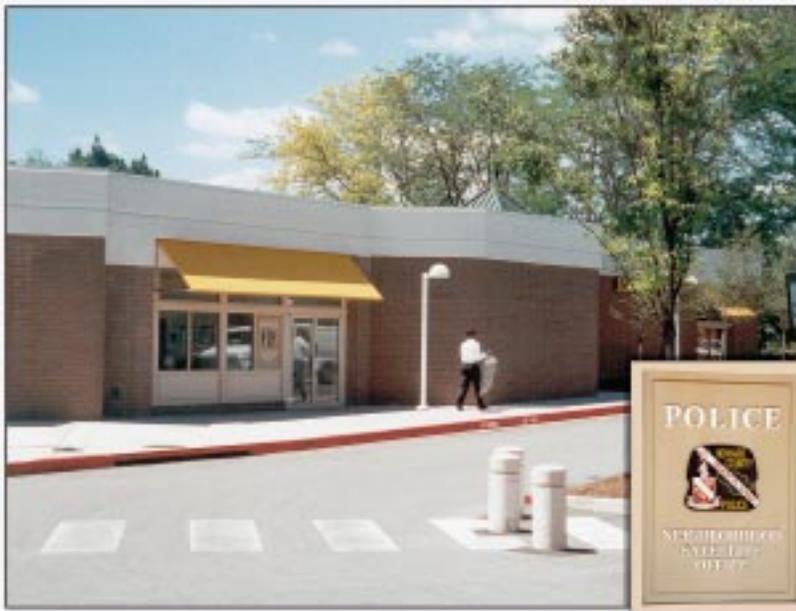
## GIS & Management: **Accountability**



**Figure 3.16**

A case status map, Wilson, North Carolina.

*Source: Jeff Stith and Wilson, North Carolina, Police Department. Reproduced by permission.*



**Figure 3.17**

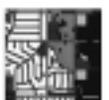
A photograph of a storefront police station, Long Reach Village Center, Columbia, Maryland. Geographic analysis can assist in the process of selecting an appropriate location for neighborhood facilities.

*Source: Keith Harries.*

ation, and senior services into the police department's Risk and Protective-Focused Prevention (RFPF) program—a problem-prevention model developed at the University of Washington. RFPF facilitates understanding of the causes and prevention of adolescent substance abuse, delinquency, violence, dropping out of school, and pregnancy. Further:

By integrating the theoretical concepts of Risk Focused Policing

with the cutting-edge technology of Geographic Information Systems (GIS), Redlands has been able to map community, family, and school and peer group risk and protective factors at the neighborhood level. This enables the police departments and the many community-based organizations that share access to this data to effectively focus their limited resources on the most problematic areas where the greatest



potential for change exists.  
[City of Redlands, 1999; see  
also Hawkins, 1995.]

The key is to mobilize collaborating institutions—schools, government, and community-based organizations—to reduce risk factors and foster “resilient youth.” The seven maps shown in figures 3.18–3.24 provide a sample of the kinds of maps prepared in support of risk focused policing in Redlands.

### Courts and corrections

As in other realms, law enforcement mapping can apply to any situation involving the display or analysis of spatial data. Courts and corrections are unusual in that many of their applications may involve large-scale representations of the type referred to as high-resolution geographic information systems and described in

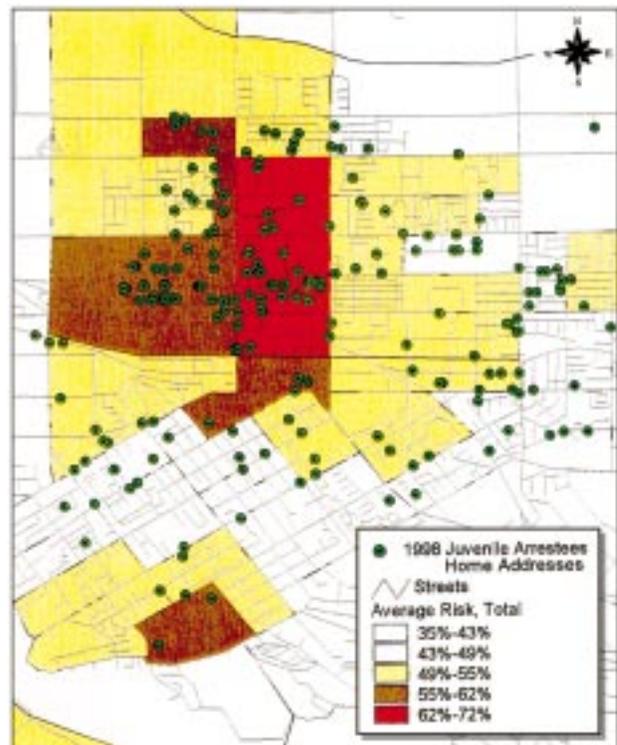
chapter 6. This type of display is also called forensic cartography in courtroom situations. Such large-scale maps are useful for illustrating the location of objects in relation to other objects in a building, a room, or a prison setting where incidents or gang activities have been problems.

Court and law enforcement mapping applications are in their infancy but will develop rapidly. A message on the crimemap listserv in 1999, for example, referred to GIS applications in the Wisconsin Department of Corrections. The message noted that four neighborhood offices had been selected for an enhanced supervision project and they routinely exchanged information with the Madison Police Department about where offenders were located. Other applications included using mapping to reduce the overlap of agents in a three-county region and for a graffiti eradication project (Koster, 1999). In

Figure 3.18

A juvenile arrestees’ home addresses map superimposed on a total average risk map.

Source: *City of Redlands, California, 1999.*  
Reproduced by permission.



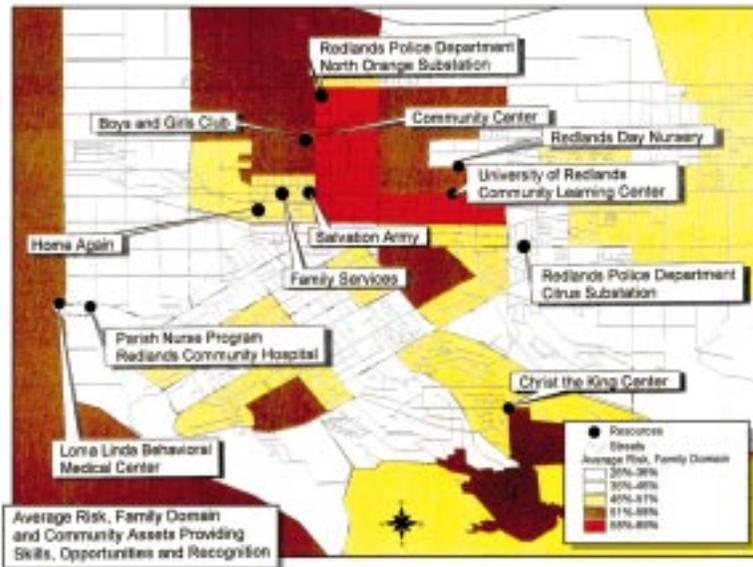


Figure 3.19

A map showing the average risk of family domain superimposed on a map of community assets providing skills, opportunities, and recognition.

Source: City of Redlands, California, 1999. Reproduced by permission.

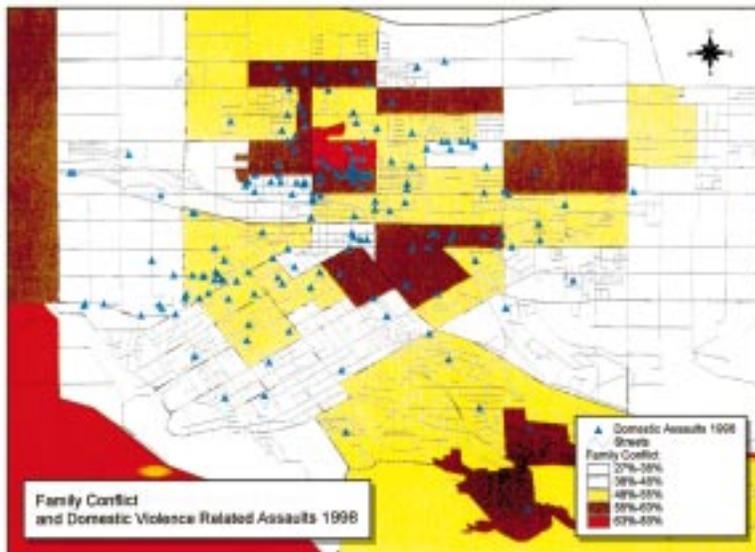


Figure 3.20

A domestic assaults map superimposed on a map showing the family conflict index.

Source: City of Redlands, California, 1999. Reproduced by permission.

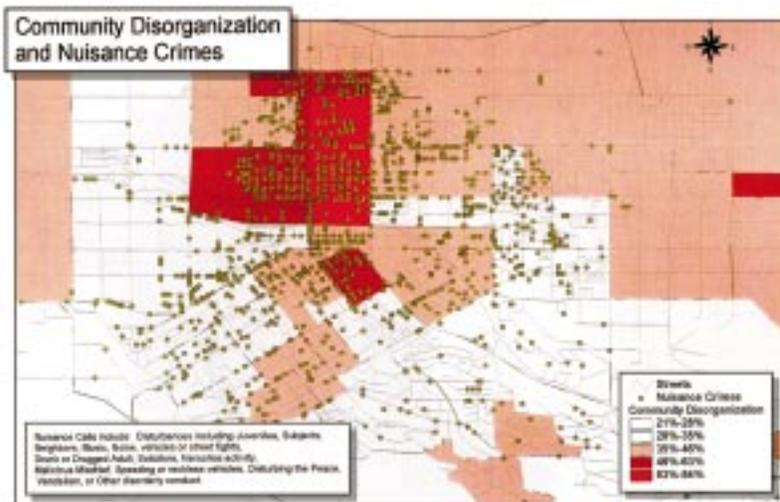
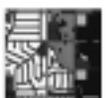


Figure 3.21

A nuisance crimes map superimposed on an index of community disorganization.

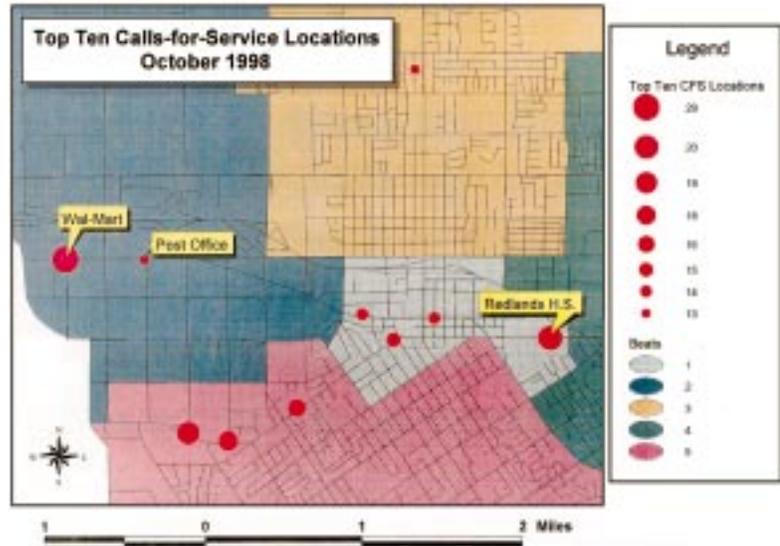
Source: City of Redlands, California, 1999. Reproduced by permission.



**Figure 3.22**

A map showing the location of the top 10 calls for service superimposed on a map of police beats.

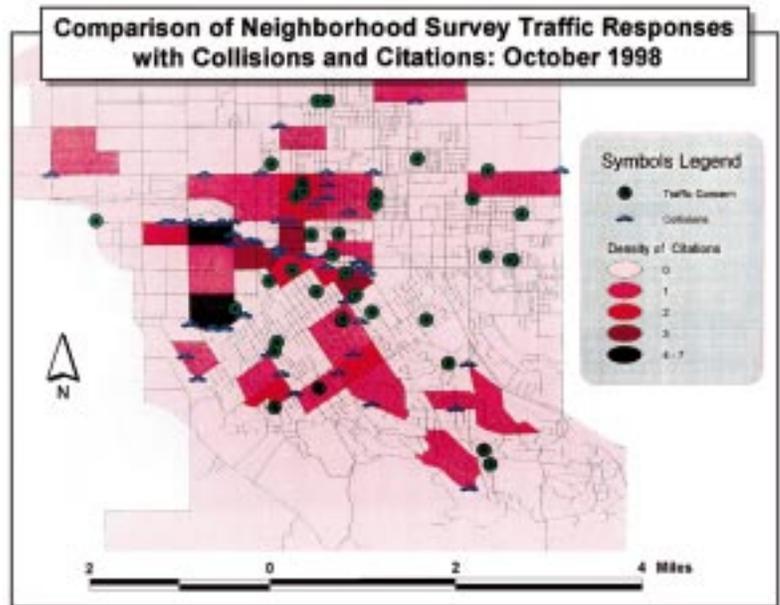
*Source: City of Redlands, California, 1999. Reproduced by permission.*



**Figure 3.23**

A comparison of neighborhood survey traffic responses with collisions and citations.

*Source: City of Redlands, California, 1999. Reproduced by permission.*



**Figure 3.24**

A map of where bats tested positive for rabies.

*Source: City of Redlands, California, 1999. Reproduced by permission.*



### To Massage or Not to Massage Data?

The risks of audience misunderstanding and confusion increase as you stray from raw data by, for example, calculating rates based on the population or other conditions. Saying more, better, has a tradeoff. Is it worth the price? You be the judge.

addition to forensic and intrainstitutional investigative work, GIS has applications in resource allocation, offender tracking and monitoring, and facility location. Some of these are discussed in chapter 5.

### Policymakers: The medium and the message

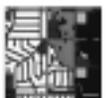
A police department's in-house maps may take on a routine character, as the audience learns what to expect in map format and style. For an external audience, however, presentation needs to be handled differently. For example, how should data be massaged, if at all? Should data be presented as raw frequencies or in the form of a pin map, or should the numbers of incidents be converted into rates adjusted for population? Would other rates or ratios be more informative?

Ultimately, only the analysts and those doing the presenting can answer these questions. The analyst should put herself or himself in the position of the intended audience and ask specific questions. Are audience members likely to understand maps? Will they understand your maps? How can a point be communicated simply and directly? Is the map too complicated? Will this map serve its purpose?

These are extremely important considerations when addressing policymakers and community groups. Such groups are political by nature and will likely attempt to use information presented to them to their own advantage. When information is complex, the room for political maneuvering increases, and the underlying "truth" is more likely to become a casualty. This does not mean that sophisticated mapmaking is taboo. Rather, it suggests that external audiences may need to be educated about the types of maps they can expect to see and the pros and cons of each.

The need for education about map types is only one possible complication. In addition to being confused by different modes of data presentation, external audiences may have little or no appreciation for spatial analysis. This dictates simplicity, at least in the initial stages of using maps to publicly present crime data. Care must be taken to provide a consistent style and format, which includes the consistent use of scale. A minor problem may be perceived as worse than it is if it is presented in large type or vivid colors (figure 3.25).

As noted, another issue to be considered is management of the presentation. How will the map(s) be presented? Using hard copy? As a presentation? (If a presentation, will it use computer software, an



overhead projector, slides, or what?) By fax? In a report? (If a report, will it be printed in color or monochrome?) As an e-mail attachment? As noted in chapter 2, each presentation mode requires different design considerations, including color and scale. The difference between what works in a fax presentation and what works in large-format, color hardcopy is extreme. The latter can accommodate detail and color; the former demands expression in plain, bold, and simple terms.

## Community organizations

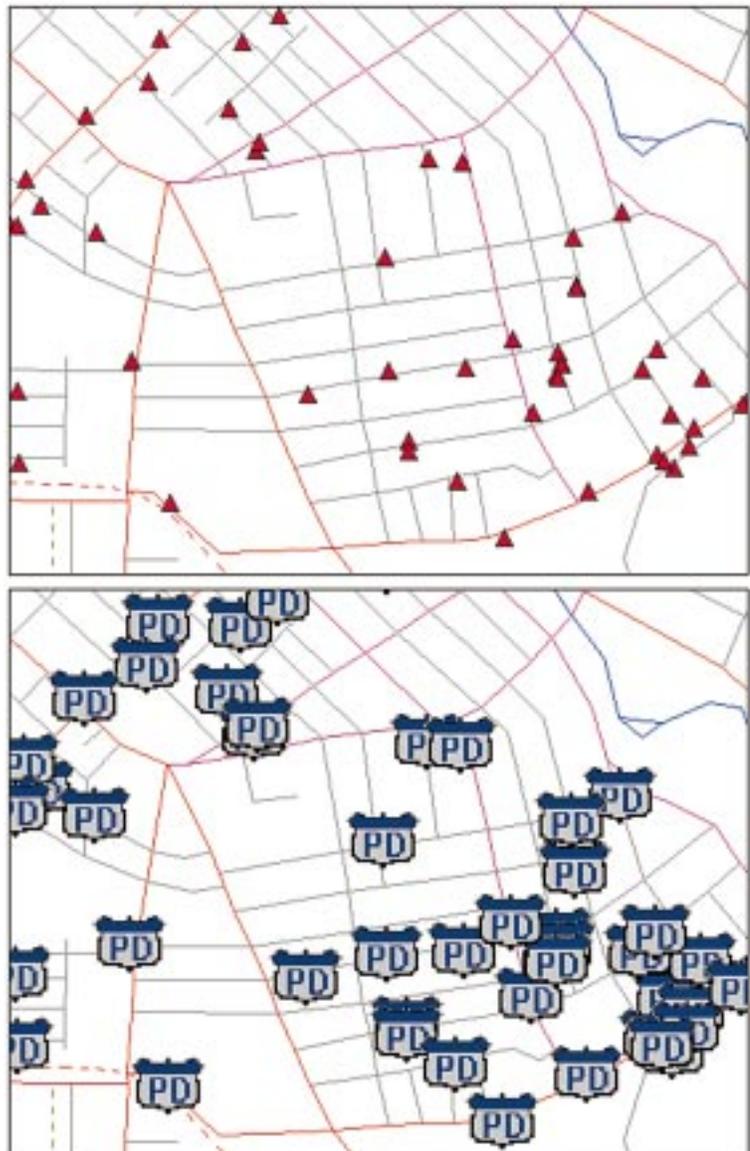
Similar considerations apply to presentations aimed at community organizations. Again, the design and mode of presentation considerations need to be taken into account. For example, community maps could be produced for the following audiences and events:

- Neighborhood watch groups.

Figure 3.25

Two presentations of the same data that may lead to different perceptions, i.e., a “lesser” problem (top) or a “greater” problem (bottom).

Source: Keith Harries.



- Neighborhood patrol groups.
- Public meetings to address specific problems (reactive).
- Public presentations to promote goodwill between the police department and the community (proactive).

In each case, the nature of the audience influences map design, content, and use. For example, neighborhood watch and neighborhood patrol maps may be used in the field. Therefore, their design must be suited to less-than-ideal reading conditions. Public presentations should accommodate the audience's level of sophistication, which is often a reflection of their age and education. If complex street patterns or topography make the mapped area confusing, the analyst may use more icons on maps to "pictorialize" the maps. However, great care is needed

to avoid patronizing audiences or giving the impression that the police department is putting something over on them by using complicated maps. Figure 3.26 shows a map of community resources that can be used as a basis for the formation of constructive alliances.

## Conclusion

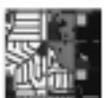
If geographic information is useful in a law enforcement context, ways can often be found to present that information in a map. Geographic crime data alone are not enough to create a meaningful map, as they must be paired with a base map and other data to make the map interesting. Every day, however, the demand for "geographically enabled" data grows as businesses, governments, and organizations begin to appreciate the value of maps and spatial analyses.



Figure 3.26

Community organizations in Detroit mapped as part of an effort to reduce Devil's Night arson.

Source: Martin, Barnes, and Britt, 1998. Reproduced by permission.



### Summary

Chapter 3 has explained:

- How maps can be designed to address specific issues and the needs of special audiences, such as patrol officers, investigators, and police managers.
- How maps can be used in support of COP and POP.
- The importance of the medium and the message in communicating with policymakers.
- How maps can be used in courts and corrections.

### What's Next in Chapter 4?

- The role of GIS in crime mapping.
- How GIS is used in law enforcement agencies.
- How GIS affects what we can do and how we do it.
- Vector and raster formats.
- Geocoding.
- Filtering data.
- Measurement using maps.
- Constructing derivative measures.
- Hot spots.
- Buffering.
- How large databases can be used in mapping and analysis.
- Data warehousing and data mining.
- Factors demanding caution in the mapping process.

### Notes

1. This section draws extensively on an Office of Management, Analysis and Planning (nd) document cited in the references; also see Dussault, 1999.

2. I am indebted to Sgt. Jeff Dean (San Diego, California, Police Department) and

Dr. Richard Lumb (Director, Strategic Planning and Analysis, Charlotte-Mecklenburg, North Carolina, Police Department) for the elements contained in this list. Any misinterpretations are the author's.

