Smart Policing in Los Angeles: Targeting Gun Violence

Introduction

The Los Angeles Police Department (LAPD) and its research partner, Justice & Security Strategies, Inc. (JSS) request funds to enhance its data-driven, evidence-based approach to crime control. Within the Smart Policing Initiative, we focus on reducing gun violence in specific neighborhoods in Los Angeles. Using computer mapping, a variety of location-based data (crimes, census, land use, etc.) and spatial analysis, we will select specific areas for intervention and mitigation. Using Goldstein's problem–oriented policing model, the LAPD and JSS will carefully examine the violence problem in specific areas in Los Angeles, develop responses to the problems, and follow up with a rigorous assessment by JSS.

To conduct this initiative, the LAPD requests funds for a crime/intelligence analyst and GIS software. Through a subcontract to JSS, funds will be provided for Dr. Craig D. Uchida to analyze data, develop crime reduction strategies, and write analytic reports that link problem solving, criminological theory and spatial analysis. The LAPD will provide in-kind support for the Project Director, Lt. Sean Malinowski, Ph.D. and for Police Administrator Maggie Goodrich, who will assist with the integration of GIS into the LAPD system. In addition, office space will be provided to JSS in the LAPD Operations Center at no cost. The project period is two years with a budget of $500,000.

Smart Policing

The Smart Policing Initiative is based on a combination of three components: evidence-based, data-driven, and problem oriented policing. Since Herman Goldstein first advanced problem-oriented policing in 1979 law enforcement has moved forward erratically to implement his strategy. As Goldstein notes, "implementation has been spotty, uneven, and without deep and

lasting roots. Problem-oriented policing remains overshadowed by the dominant, continuing commitment to traditional policing and its heavy dependence on lots of police officers patrolling and making arrests". Moreover, "a major impediment in advancing the concept has been the absence of an analytical capacity within police agencies… when crime analysts are employed, the job is often narrowly limited to tabulating crimes or to identifying the likely offender so that he/she can be apprehended (Goldstein in Clarke and Eck, 2007)."

To overcome these limitations, the Smart Policing Initiative allows for an expansion of the duties of a crime analyst, the collection and analysis of location-based data, the development of rigorous data-driven operations, and an assessment of the effects of the intervention on crime. In essence, Smart Policing encompasses the SARA model (Scanning, Analysis, Response, and Assessment), but with more rigor and outcome measures.

I.   Statement of the Problem

The LAPD is the third largest municipal police agency in the nation. The department serves over four million people with 9,300 officers and 3,000 civilians. When Chief William Bratton was hired as police chief, he initiated the use of real-time information to further reduce crime, target gang violence, and mitigate the threat posed by terrorism. Not only did he re-structure Compstat (computer statistics), he created the Real-time Analysis and Critical Response Division (RACR) to provide a 24-hour response and notification apparatus as well as a means to quickly activate the Department Operations Center (DOC) for emergencies during off hours. After six years, crime in LA has been reduced to historically low levels, with Part I crimes down 33% and homicides down 41%. Figure 1 shows the drop in violent crime. While these numbers are impressive, the Chief recognizes that new methods are needed to maintain and continue the drop in crime in Los Angeles. To do so requires the use of technology, research, and innovation.

The Smart Policing Initiative and the LAPD's Predictive Policing program[1] are methods that will provide the department with additional tools to fight crime.

Figure 1. LAPD Violent Crime Rate, 1985-2007
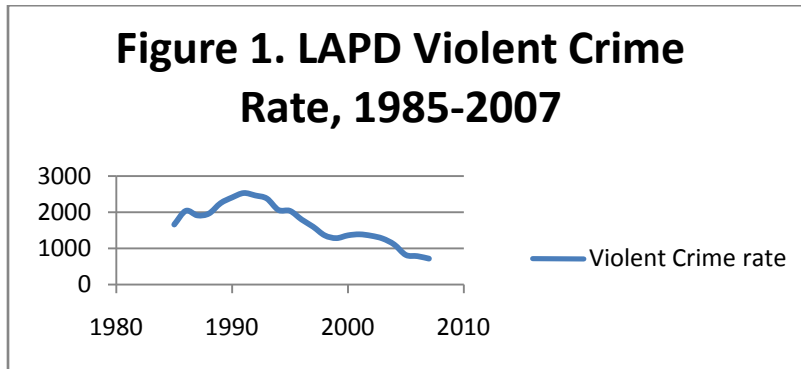
As an example, Smart Policing can assist the LAPD in dealing with reducing gun violence in specific neighborhoods. During the most recent three-year period (2006-2008), the LAPD received 54,000 calls for service for shots fired throughout the city of Los Angeles. These numbers fluctuate by year (Figure 2), but provide an indication that weapons use may be a problem in specific neighborhoods. Under this initiative, we would further analyze these calls using GIS and spatial analysis, determine an appropriate response, and evaluate the results.

Figure 2. Calls for Service: Shots Fired, 2006-08, LAPD

Year	Number of Calls "Shots Fired
2006	17,585
2007	19,917
2008	16,498

II.   Program Design and Implementation

The idea of Smart Policing builds on intelligence-led policing and problem solving. In the LAPD, data are extremely important, as information is used continually for accountability purposes and crime reduction. In the LAPD, Compstat accountability meetings have enabled

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[1] Predictive Policing refers to a law enforcement strategy that brings together technological tools, management practices, real-time data analysis, problem-solving, and intelligence-led policing that ultimately lead to *results* -- crime reduction, more efficiently-run police agencies, and modern and innovative policing. Predictive policing encourages the use of business intelligence software that "data mines" and discovers hidden patterns and relationships.

executives to focus on crime hot spots and respond to crime problems faster and more thoroughly than was previously possible, but the depth of information and the breadth of analysis have been limited. Through the Smart Policing initiative, LAPD can utilize GIS and statistical analysis to not only determine locations of hot spots, but examine the nature of the relationship between and among the people, places and things associated with crime.

We identify three goals and five objectives for this project, including:

Goals:
1. Reduce crime by improving the use of analytic tools
2. Improve neighborhood safety by using problem solving methods
3. Increase efficiency of police officers and investigators by using new and innovative technology

Objectives:

1. Use problem-oriented policing to reduce crime
2. Use a robust GIS-based data system to target locations of crime and identify patterns of criminality
3. Use new techniques for data analysis and predicting crime for tactical and strategic purposes
4. Use appropriate criminological theories in crime prevention and crime control to guide strategies and the use of data
5. Develop appropriate law enforcement strategies to prevent/control crime

Problem-Oriented Policing

Goldstein's problem-oriented policing model involves scanning, analysis, response, and assessment. During the scanning phase a problem is identified using data from multiple sources. In Los Angeles gun violence has been a continuing problem and will be one of the problem solving projects under this initiative. Analysis will be undertaken during the second phase and we will construct a database 1) using "hot spots"; 2) using 'time'; and 3) using neighborhoods and activities. We will also use data mining software to assist in the analysis.

Using Hot Spots. Our methodology will identify stable hot spots based on five years of crime data. The relationship between events committed in those locations (the hot spot

locations) would allow for the selection of data from which data mining would occur.[2] The advantage is that any relationship between offenders and some predictive variable would be for those crimes committed in the hot spot. This will help structure the analysis and assist the LAPD develop targeted strategies.

Using 'time.' Crime has a very definite periodicity, showing hourly, weekly, monthly, and seasonal variations. By focusing on some of the temporal dimensions (e.g., crimes committed on Fridays and Saturdays), the analysis becomes more organized. This will assist analysts to drill down into the data and provide LAPD with guidelines for deployment and crime prevention.

Using Neighborhoods and Activities. Initially, we will focus on crimes committed in certain neighborhoods and also around specific activities. The hot spot analysis coupled with overlays of demographic, socioeconomic, and public health information will allow us to distinguish neighborhoods from each other. We will begin to look at gun violence activities within the areas – e.g., shots fired, assaults, robberies, and homicides – to assist in deployment strategies.

By conducting hot spot analysis, temporal analysis, spatial analysis, and activity analysis we will organize the problem solving process to be efficient, focused and adaptable to LAPD policing practices.

Within our program design we will pay close attention to the goals, objectives, and performance measures of the project. These include the following:

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[2] Data mining refers to a process where software, developed by SPSS or other companies, 'churns' through multiple databases seeking commonalities and patterns that assist business marketers and more recently, police agencies. In the last five years, police departments have begun to invest in these products to assist them in analysis of large databases.

Figure 3. Goals, Objectives and Performance Measures

Goals of the Project	Objectives	Performance Measures	Timeline/Milestones
Reduce crime by improving the use of analytic tools	Retain and/or hire a crime/intell analyst, retain JSS as the research partner to collect and analyze data; assist with crime reduction strategies, and write reports that link theory, problem solving, and spatial analysis	Number of arrests using data-driven analysis; number of problem-oriented policing projects	Quarterly report
Improve neighborhood safety by using problem solving methods	Target specific areas of guns violence using GIS and other data to solve crimes and clean up neighborhoods.	Arrests and convictions of violent predators leads to crime reduction, safer streets and communities	Quarterly report
Increase efficiency of police officers and investigators by using new and innovative technology	Continuously collect data and analyze info; create maps; develop strategies to prevent/control crime.	Analysis of calls for service and arrests and non-traditional data every quarter; computer generated maps will assist police with their investigations.	Ongoing throughout the two-year grant period; quarterly report

Data Structure and Data Sources

A central component of this project is to enhance the LAPD's data infrastructure with a GIS base that can be used as a model for other police agencies. The data infrastructure will not only include crime data, but will also draw upon databases from within the city and county of Los Angeles, the state, and the Federal government, that are pertinent to explaining criminal behavior.

Crime data. In the LAPD, Compstat meetings are held regularly. Data for Compstat include calls for service, incident reports, arrest reports, records management information, and other

data. For the Smart Policing Initiative, we will use address-based data, date, time, type of offense, and other characteristics for more in-depth analysis. At a minimum the following types of crime-related information will be part of the data infrastructure:

- LAPD Calls for Service
- LAPD Incident Reports
- LAPD Traffic citations and accidents
- LAPD Arrest reports
- Los Angeles County Medical Examiner: incident, address-level data for all non-natural deaths (including homicides) and the causes and circumstances of the death.

Variables Measuring Violence in Neighborhoods. To obtain a fuller picture of crime patterns in Los Angeles, additional data will be analyzed. For example, one of the major issues confronting neighborhoods, communities, and law enforcement is violence. We will construct indices of violence as independent variables. The following gives an example of how we might measure violence:

1. Number of homicides
2. Number of aggravated assaults
3. Number of forcible rapes
4. Number of robberies
5. Total number of Part I Violent Crimes
6. Total number of Part I Property Crimes
7. Total number of Part I Crimes
8. Number of drug arrests
9. Number of shots fired
10. Calculated indices:
    a. Percent of all crimes made up of violent crimes
    b. Social Disruption Index: Part I crimes + Motor vehicle crashes
    c. Harm-to-Persons Index: Part I Violence Crimes + Motor Vehicle Crashes Ending in Fatalities or Incapacitating Injuries.

Demographic, land use, and economic data. U.S. Census data from 2000 and socio-demographic information that is projected to 2005 and 2010 will be used. We will purchase data from EASI Demographics (for projections based on mailable US addresses) to provide census block level data concerning the number of families by block, children by block, racial and ethnic

demographics, immigration demographics, population density, and age distribution. These data also provide information on homeownership rates and income and economic activity by census block. In addition, the release date for Census 2010 is projected for mid-2011. We will update all of our systems when these data become available.

III.   Capabilities/Competencies

The Smart Policing Initiative relies on the willingness of a police department to invest in technology, personnel, research analytics, and the problem solving process to control crime. Since his arrival in 2002, Chief William Bratton has emphasized that the LAPD serve as a research laboratory for testing new strategies and techniques and has opened the department to researchers. As such, Dr. Craig Uchida and Justice & Security Strategies were enlisted to serve as the research partner for this project and others associated with Predictive Policing.

The Los Angeles Police Department

Lt. Sean Malinowski, Ph.D. will be the Project Director and oversee the implementation of Smart Policing within the Real-time Analysis and Critical Response Division (RACR). Lt. Malinowski received his doctorate in Public Administration from the University of Illinois at Chicago and has a keen appreciation for research and data and understands their importance in police operations. He will devote 25% of his time to this project, which will be an in-kind contribution from the LAPD. He will be responsible for hiring a Crime/Intelligence Analyst under this project. The Crime/Intelligence Analyst will assist in analyzing information and data and work closely with the LAPD's research partner, Justice & Security Strategies, Inc.

Lt. Malinowski has served in the LAPD for 14 years serving as a patrol officer, patrol sergeant and then serving in the Office of the Chief. As Assistant Commander of RACR, Lt Malinowski conducted a thorough needs assessment and developed a detailed strategic plan for the transition of RACR from Special Operations Bureau to Detective Bureau.

Ms. Maggie Goodrich will serve as Senior Advisor for Technology and devote 20% of her time to the project, which will be an in-kind contribution by the LAPD. As Police Administrator III, Ms. Goodrich is the civilian equivalent of a Deputy Chief. She is the Commanding Officer for the Management Systems Reengineering Project established through the Federal Consent Decree. Ms. Goodrich earned her law degree at the University of California, Hastings College of Law and her Bachelor's degree at Chapman University. She is the former Policy Director for the Deputy Mayor of Homeland Security and Public Safety in Los Angeles and in the private sector managed and implemented eCommerce solutions for two companies.

Research Partner: Justice & Security Strategies, Inc.

Dr. Craig D. Uchida at Justice & Security Strategies, Inc. (JSS) will be responsible for assisting the LAPD with the analytic software to identify hotspots and conduct data mining, the analysis and assessment phases of problem solving, the development of crime reduction strategies, and to train the crime/intell analyst. Dr. Uchida is a criminologist who has conducted field research throughout the country (drug enforcement, use of force, community policing, search warrants, problems in schools and gangs), published refereed journal articles, edited two books, managed and administered major grant programs in the US Department of Justice, and currently leads and directs a national criminal justice consulting firm. Dr. Uchida has extensive experience in community policing, problem solving, and police-related data.   His biography and resume are in the Appendix.

IV.   **Impact/Outcomes, Data Collection, and Performance Measures**

Problem-oriented policing requires careful analysis and subsequent assessment or evaluation of the specific response or intervention. RACR and JSS will select discrete areas for interventions based on the analysis. Depending on the hot spot, spatial, and temporal analyses, we will select a number of locations from which to use Smart Policing. Ideally, the area for the

intervention will be relatively small, perhaps an eight to ten square block area. During the analysis phase, RACR, the police division where the hotspots are located, and JSS will carefully study the area. Calls for service will be analyzed to determine day, time of day, and season when criminal activity occurs. The crime/intelligence analyst trained by Dr. Uchida will ride with police officers to assess the physical conditions of the neighborhood. Businesses, residences, other land usage as well as empty lots, vacant buildings, trash, abandoned cars, and other signs of disorder will be accounted for. People in the neighborhood will be observed – what are they doing? Talking to neighbors? Walking? Driving down the street slowly? Playing chess in the park? Or, are they dealing drugs on the street corner or just hanging out? These observations are important for they are indicators of the conditions within the neighborhood that may change as a result of the interventions. The crime/intelligence analyst will observe activity at various times before, during, and after the interventions to determine whether improvements in the physical environment and changes in the behavior of residents are occurring.

For major problem solving projects that takes place, JSS will write a brief report that includes scanning, analysis, response, and the assessment. Appropriate maps and data will be presented.

Performance Measures. In addition to the results of the problem solving efforts, we anticipate that police officers and investigators will make arrests and solve crimes. As such, JSS will keep track of the number of individuals who are arrested as a result of data-driven analysis. Every three months JSS will conduct analyses of calls for service, arrests, and non-traditional data to determine whether changes occur in specific areas. Lastly, the number of officers who use GIS and other technologies will be counted and interviewed to determine whether their investigations were aided by the technologies.