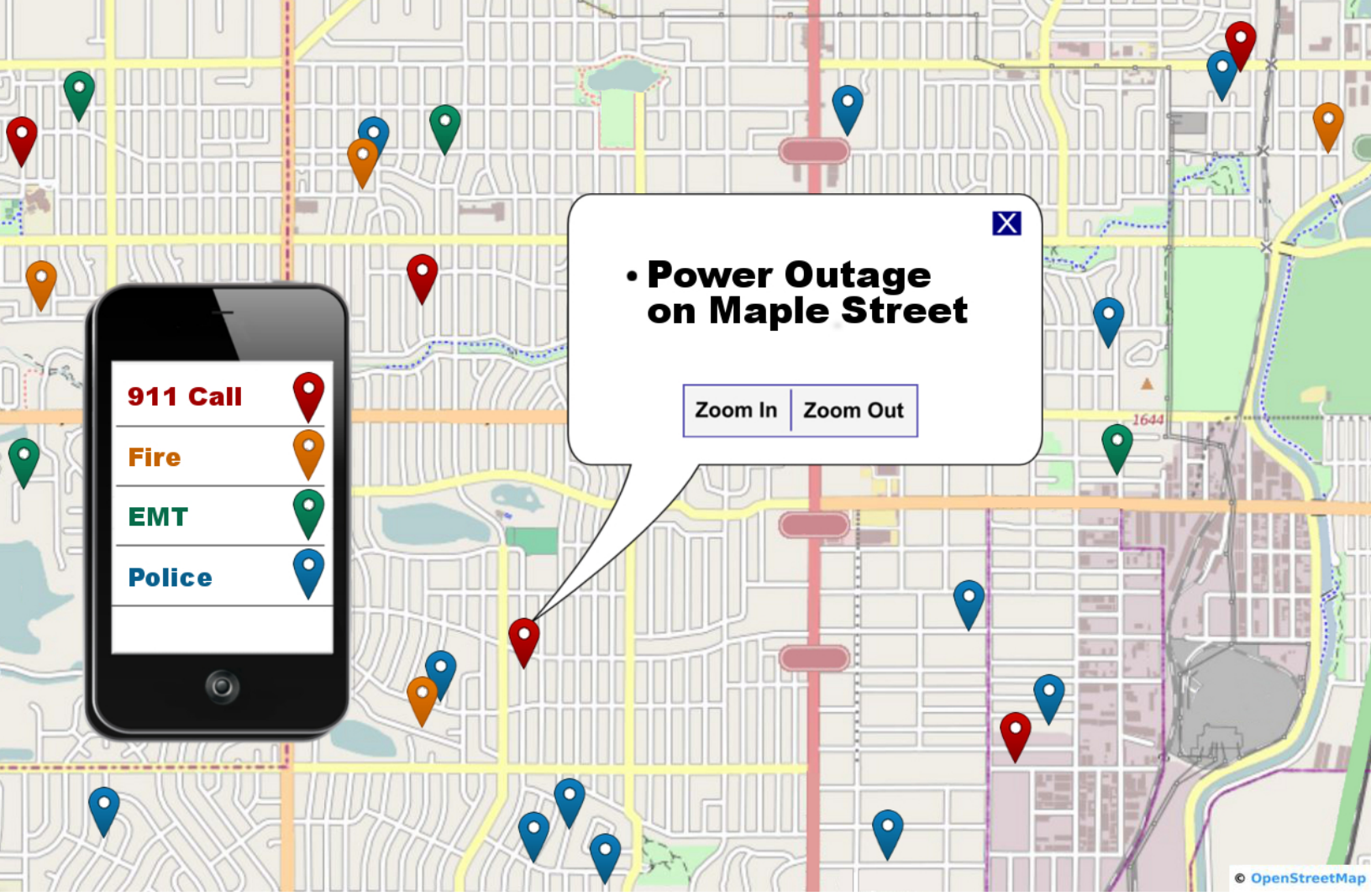

System Assessment and Validation for Emergency Responders (SAVER)

Geographic Information Systems and Predictive Policing Application Note

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Science and Technology

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SAVER
System Assessment and Validation for Emergency Responders

Prepared by Space and Naval Warfare Systems Center Atlantic

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FOREWORD

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions. Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective assessments and validations on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL). The SAVER Program mission includes:

- Conducting impartial, practitioner-relevant, operationally oriented assessments and validations of emergency responder equipment; and
- Providing information, in the form of knowledge products, that enables decision-makers and responders to better select, procure, use, and maintain emergency responder equipment.

Information provided by the SAVER Program will be shared nationally with the responder community, providing a life- and cost-saving asset to DHS, as well as to Federal, state, and local responders.

The SAVER Program is supported by a network of Technical Agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

As a SAVER Program Technical Agent, the Space and Naval Warfare Systems Center (SPAWARSYSCEN) Atlantic has been tasked to provide expertise and analysis on key subject areas, including communications, sensors, security, weapon detection, and surveillance, among others. In support of this tasking, SPAWARSYSCEN Atlantic developed this document to provide emergency responders with information on the application of geographic information systems (GIS) to predictive policing solutions. GIS falls under AEL reference 04AP-03-GISS System: Geospatial Information.

Visit the SAVER section of the Responder Knowledge Base (RKB) website at https://www.rkb.us/saver for more information on the SAVER Program or to view additional reports on GIS or other technologies.

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1. INTRODUCTION

Geographic information system (GIS) tools display, store, manage, and analyze geospatial data and related information. These tools are key components in the emerging science of predictive policing, which combines crime mapping, statistical analysis, and law enforcement expertise to provide forecasts of where and when crimes will most likely occur. Given the budgetary constraints of many police departments, predictive policing software solutions may serve to increase police effectiveness and ultimately reduce crime by helping to guide the strategic deployment of officers in the field.

The purpose of this application note is to provide law enforcement agencies with information about the components, functionality, and use of predictive policing products and to assist them in system procurement and deployment.

2. TECHNOLOGY OVERVIEW

Crime analysts have long used GIS mapping software for:

- Plotting and visualizing the locations of unlawful activities;
- Detecting crime patterns; and
- Helping to formulate strategies for identifying suspects, deploying officers, and making arrests.

In recent years, this practice has been augmented by the introduction of a more scientific approach to crime fighting often referred to as predictive policing. The goal of predictive policing is to apply statistical modeling techniques to crime and non-crime data, such as weather and time of day, in order to determine the underlying causes or trends of criminal behavior and use this information in future crime fighting efforts and analysis. With this approach, law enforcement agencies may be able to prevent crime as well as increase efficiencies.

The rise in the development of predictive policing software tools has been the result of work undertaken by both academic researchers and commercial vendors, usually in conjunction with law enforcement agencies or government entities such as the National Institute of Justice (NIJ). Numerous software options, including some freeware, are currently available to practitioners who are considering the implementation of this technology. The key elements of these tools are described below.

2.1 Crime Mapping

The use of GIS tools has greatly facilitated and enhanced the creation of crime maps, which visually pinpoint reported unlawful activities and help analysts detect spatial and temporal crime patterns and trends. Analysts can also use GIS tools to overlay mapped crime data with a variety of non-crime data such as population density, income, and land use (e.g., the location of schools or liquor stores in a neighborhood). These composite map views help law enforcement agencies gain a better understanding of the factors that give rise to crime and devise more effective response or mitigation strategies.

Within predictive policing solutions, the GIS component can be used to geocode data (i.e., to assign geographic coordinates, usually expressed in latitude and longitude values, to data inputs so that the data can be displayed on a map). After geocoding, the GIS component can also be used to visualize raw data, provide a foundation for subsequent analysis and forecasting, and create maps that show the results of analysis and forecasting.

An overview of GIS mapping is included in the SAVER program's *GIS Software Selection Guide*, available at https://www.rkb.us/saver.

2.2 Crime Analysis

The primary objective of crime analysis is to provide a systematic examination of patterns and trends associated with unlawful activities. This aspect of analysis focuses on the following:

- The time and location of crime incidents such as assault, burglary, and car theft;
- The time and location of disorderly incidents such as loitering, noise violations, and panhandling; and
- Incident-related information on offenders, victims, physical targets, such as property and buildings, and the demographic and socioeconomic makeup of an area.

Based on their analyses, law enforcement agencies can formulate resource allocation strategies (e.g., when to deploy officers to particular locations) or help develop initiatives aimed at deterring crime (e.g., neighborhood watch programs and securing vulnerable physical targets such as convenience stores and abandoned buildings). In addition, crime analysis encompasses the processes of evaluating:

- The effectiveness of implemented response tactics and strategies;
- The effectiveness of services provided by police such as safety education and victim assistance; and
- Administrative considerations such as staffing levels and budgetary expenditures.

A number of crime analysis frameworks have been formulated and include models that evaluate a specific geographic region or describe a particular type of crime pattern. Although a detailed survey of analytical frameworks is beyond the scope of this report, a representative sample of different approaches is presented below.

2.2.1 Hot Spot Analysis

Hot spots are localized geographic areas with above average levels of criminal activity. The greater the number of crimes in an area, the 'hotter' it becomes. Hot spots are defined in terms of historical data (i.e., where crimes have occurred during a specified time frame in the past) and can be displayed on maps generated with GIS software tools.

Practitioners can create hot spot maps for specific categories of crime and use a variety of techniques for displaying and analyzing the information. These techniques include displaying individual crimes as points on a map and analyzing their distribution, observing crime levels within administrative areas, such as police beats or census zones, and estimating crime densities within a predefined search radius. Figure 2-1 shows examples of hot spot maps.

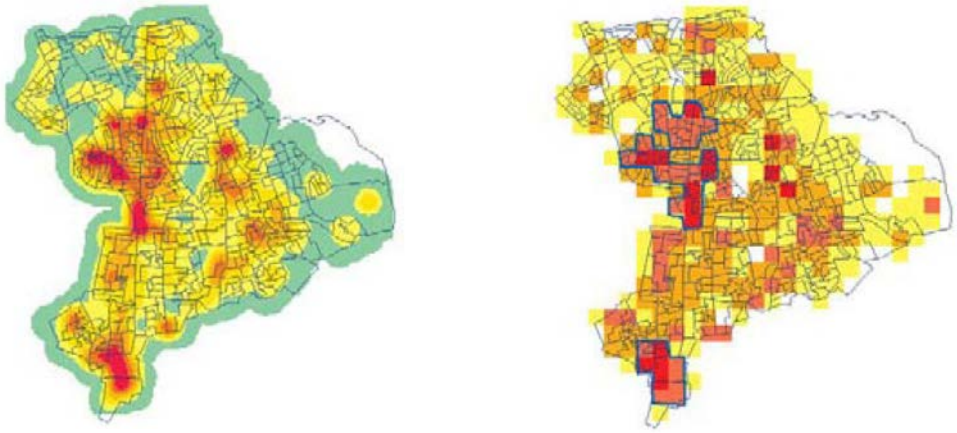

Figure 2-1. Sample Hot Spot Maps[1]

Courtesy of the National Institute of Justice

The existence of hot spots suggests that crime is not random and that it tends to cluster in areas where opportunities for unlawful activities exist. Hot spot mapping and analysis may not capture the temporal dynamics and social and environmental factors that underlie criminal behavior.

2.2.2 Repeat Analysis

Repeat analysis is based on the premise that recently victimized people and physical targets, or those sharing geographic or other similarities, have a higher probability of being victimized in the future. The most common types of this analysis are exact-repeat, near-repeat, and virtual-repeat incidents.

An exact-repeat incident is a criminal activity that takes place at the same location at different times and therefore involves the same victim or physical target. An example would be a liquor store that is burglarized multiple times in a year.

Near-repeat incidents are crimes that take place in proximity to one another in a given time frame and therefore indicate both a spatial and temporal connection. Examples of near repeats would include multiple burglaries of similar homes in the same neighborhood and retaliatory gang violence in a particular section of a city.

Virtual-repeat incidents take place at different locations and times involving victims or physical targets that are virtually identical in terms of shared characteristics. An example of virtual repeats would be robberies at a city-wide chain of convenience stores that have similar floor plans, surveillance camera locations, and money handling policies. Each of these criminal incident types may have other attributes in common regardless of the type of incident being analyzed.

[1] Chainey, Spencer, "Methods and Techniques for Understanding Crime Hot Spots," *Mapping Crime: Understanding Hot Spots*, Chapter 2, National Institute of Justice, August 2005, https://www.ncjrs.gov/pdffiles1/nij/209393.pdf, accessed May 21, 2013.

By focusing on the element of time, repeat analysis can augment the geographical approach of hot spots by providing more robust explanations of:

- **Crime patterns:** similar crimes committed within a defined area;
- **Crime series:** crimes committed by the same person or persons; and
- **Crime trends:** persistent or recurring patterns of crime.

2.2.3 Analytical Models

To help detect patterns, trends, and interpret hot spot map data, crime analysts have employed a variety of statistical modeling techniques. These techniques range in sophistication from simple to complex and in their potential for being applied across crime categories and regions. The modeling techniques described below exemplify the array of analytical approaches available to practitioners.

Geospatial Analysis: Encompasses a wide range of statistical techniques used to quantify the geographical relationships between past incidents and characterize the spatial and environmental factors associated with them.

Regression Analysis: Seeks to determine a causal relationship between a specific type of crime, such as burglary, and one or more variables, such as time of day and/or weather conditions.

Time-Series Analysis: Leverages historical data on one or more variables to reveal trends and fluctuations in crime and is often used to evaluate the effectiveness of an implemented response strategy.

Journey-to-Crime Analysis: Estimates the residential location of a serial offender based on the assumption that follow-on crimes will be committed at places with the closest proximity and highest potential payoff to where the offender lives.

Correlated Walk Analysis: Analyzes the location of past crimes and the direction and time sequence of an offender's movements to project the likely location of a subsequent incident.

Link Analysis: Detects patterns through data mining of numerous information sources to evaluate connections between people and is often used to analyze social networks relating to potential fraud, gang, or terrorist activities.

Spider Mapping Analysis: Uses a variety of data sources to examine the link between an offender's address and crimes committed in the area; it may also be used to show connections between the offender, the offender's address, and other criminal associates.

Risk Terrain Modeling: Examines various social and environmental conditions of an area and creates maps of individual and composite crime risk factors to determine the likely location of future incidents based on geography, not past events.

Many GIS programs provide toolsets for conducting geospatial analyses of crime and can also work in conjunction with third-party statistical models and algorithms. Moreover, these same components—GIS mapping, crime analysis, and statistical models and algorithms—are at the core of predictive policing technology.

2.3 Predictive Policing

Using analysis to formulate response strategies and mitigate crime has been a common practice within law enforcement for a number of years. For many practitioners, predictive policing is simply an extension of the traditional analytical process. What most distinguishes predictive policing from traditional crime analysis is the sheer volume and variety of data that agencies can now access along with the ability to harness modern-day computing power and software tools to turn that data into actionable intelligence. This capability has enabled practitioners to perform more sophisticated analyses, gain a better understanding of the factors underlying criminal behavior, and provide better forecasts of where and when crimes may occur. Predictive policing combines law enforcement expertise with any policing strategy or tactic that develops and uses information and advanced analysis to inform forward-thinking crime prevention. The goal of predictive policing is to enhance crime prevention.

Instead of merely reacting to criminal activity, law enforcement professionals are now able to be more proactive in their crime analysis. With the forecasting capabilities of predictive policing software, agencies may be able to deploy personnel more effectively, expand their range of crime prevention strategies, and change the environmental conditions that give rise to crime.

Moreover, proactive approaches to crime reduction sometimes extend beyond law enforcement to include community involvement. With this in mind, criminology experts have emphasized the importance of integrating community-based theories of crime prevention with the data-driven modeling of predictive policing. Examples of crime prevention include the following:

- **Collective Efficacy:** Involves neighbors or members of a community working together to achieve a common goal such as reducing crime.

  Examples: Implementing a jobs program in an identified crime hot spot to encourage legitimate, rather than criminal pursuits, or creating after-school programs for at-risk youths.

- **Crime Prevention Through Environmental Design (CPTED):** Focuses on designing physical environments in ways that deter criminal activity.

  Examples: Creating natural forms of surveillance by designing city streets to promote pedestrian activity, which would discourage burglaries, or by building apartments that have windows overlooking parking lots to discourage car break-ins.

- **Situational Crime Prevention Theory:** Seeks to influence an individual's choice to commit a specific type of crime by controlling environmental factors in ways that reduce the opportunity for the crime to occur.

  Examples: Making car alarms visible or improving street lighting in high-risk areas to discourage auto theft.

2.3.1 Features and Capabilities

Predictive policing software products offer a variety of features and capabilities including the following:

- Predictive analytics and forecasting;
- Pre-configured and/or customized statistical models and algorithms;

- Geospatial mapping;
- Data imports from computer-aided dispatch (CAD) systems, records management systems (RMS), and other sources;
- Data mining for crime pattern recognition;
- Social network analysis;
- Alert capabilities for notifying officers when to deploy to a particular hot spot; and
- Communication tools for creating reports and presentations that have maps, charts, and graphs.

CompStat, a term that evolved from computer statistics, is a structured approach to managing and evaluating police operations and involves collecting and analyzing crime and disorder data, formulating response strategies, deploying personnel, and assessing the effectiveness of a response and the performance of the participants. Some predictive policing products incorporate CompStat into the reporting processes.

In addition, most predictive policing software applications have intuitive graphical user interfaces, which are designed to facilitate the work of both analysts and officers. Among the more common user interface features are drawing tools for demarcating geographical areas, custom filters for sorting data, single-click routine statistical analyses, and dashboard-style displays and widgets that aid in interpreting data and analysis results. Some predictive policing solutions can also deliver geographically relevant crime information to officers in the field on mobile devices including smartphones and tablets.

2.3.2 Data

In the past, analysts relied heavily on local historical crime data such as police reports and arrest records to identify patterns and trends associated with unlawful activities. However, in today's information age, analysts have faster access to an expanded set of data including: traditional crime data sources; Federal, state, and local databases; and even non-crime data all of which is used in the analysis.

Census bureau data can be useful because factors such as income, population density, and the ratio of home rental to owner-occupied housing can show a correlation to crime rates in an area. City planning data on building permits and vacant housing may give analysts insight into property crimes. Truancy data may help to establish a link between a juvenile suspect and crimes within a community. Even weather data can be useful in analyzing crime since a positive correlation between warmer temperatures and higher rates for crimes, such as burglary and auto theft, has been shown to exist in some areas. Conversely, in more temperate climates, weather may be less of a determining factor.

Because the determinants of crime may vary by location, season, and time of day, analysts can benefit from having tools that enable them to examine both crime and non-crime data. Some predictive policing solutions give users the flexibility to geocode, map, and analyze a variety of data inputs, and some vendors will work with agencies to create customized solutions that meet the needs of individual jurisdictions. In this way, analysts can use their GIS tools to overlay crime data with non-crime data and obtain a composite, more holistic view of crime in their jurisdictions. A flexible solution may also be advantageous to analysts because it gives them the

ability to use the predictive policing software as an experimental tool for determining which factors have the greatest impact in their communities.

When accessing information from multiple sources, agencies must ensure that the input data are reliable, accurate, and consistent. Common data input errors that result in erroneous outputs include:

- Incorrect, incomplete, outdated, or duplicated information;
- Incorrect or mismatched formatting; and
- Incorrect spelling or punctuation.

An agency accessing RMS from another jurisdiction may find that the record data fields are not the same in both databases. This mismatched data must be cleaned, a process that can be both time consuming and expensive, before the data is useable. Software applications or customized computer scripts may be used to clean the data but at some cost to the agency. In order to obtain valid, reliable forecasts, crime analysts must have a thorough understanding of the data they should use and how to integrate it into the analysis.

3. CONSIDERATIONS

A number of factors should be considered before purchasing a predictive policing solution. For some agencies, cost will be an important factor. Agencies should consider not only the initial cost of the product, but also the costs associated with maintaining and updating the system, training to use the software, obtaining access to data sources, and maintaining data integrity.

Agencies should also consider how the predictive policing solution will integrate with their existing technology infrastructure, as well as their routine operations and organizational policies. To be effective, a predictive policing solution requires computer hardware with sufficient capacity to accommodate needs such as data storage and network traffic. It should also integrate with other agency systems, such as CAD and RMS, and be scalable to meet both current and future needs. From an operational standpoint, agencies will need to coordinate the work of analysts and officers to determine hot spot deployments, patrol patterns, and other police services. Moreover, the predictive policing solution should support the management and reporting structure of the agency to facilitate crime analysis and data interpretation followed by response planning, response, and response assessment.

To further enhance the effectiveness of a predictive policing solution, an agency should form partnerships with community groups and other law enforcement agencies within the region. This approach will promote community policing initiatives, such as those discussed above, as well as data sharing among agencies through the use of the same RMS, the development of common data standards, and the creation of a regional data fusion center. An agency may also benefit by learning from the successes and challenges other agencies have had in implementing predictive policing solutions and by determining whether their modeling techniques, processes, and strategic response efforts can be replicated.

4. APPLICATIONS

Predictive policing solutions have been implemented in a number of cities across the country. Examples of successful applications of predictive policing strategies, responses, and results are described below. This information was obtained from Internet research and subject matter expert interviews.

Arlington, Texas

Criminal Activity: Burglary

Data and Analysis: Used residential burglary data to map crime hot spots in the city and then compared the hot spots to locations and infrastructure with reported code violations, which included broken windows, abandoned cars, and even graffiti.

Analysis Findings: A positive correlation existed between residential burglary and physical decay in the city as indicated by code violations; this led to the creation of an analytical methodology for identifying the characteristics of vulnerable neighborhoods.

Response/Results: Initiated a collaborative crime prevention effort between the police and other agencies to employ resources more effectively in vulnerable areas.

Charlotte, North Carolina

Criminal Activity: Burglary

Data and Analysis: Migrated data from sources such as RMS and CAD into a central database and later used predictive analysis tools to detect patterns relating to burglary incidents.

Analysis Findings: The burglaries tended to concentrate in particular neighborhoods during the week from 11:00 a.m. to 3:00 p.m.

Response/Results: An officer supported by a backup team was assigned to the area; after receiving a call about a suspected break-in at a vacant house in the hot spot zone, the officer and backup team were able to respond quickly enough to apprehend five suspects inside the house.

Lancaster, California

Criminal Activity: Property Crime

Data and Analysis: Created a central database that automatically takes in data from sources such as crime reports and emergency response calls and implemented a hybrid mapping and analytical solution to evaluate and present findings on the underlying causes of crime in the area.

Analysis Findings: A number of property crimes were facilitated by people not locking their cars and houses.

Response/Results: Produced a series of public information campaigns designed to urge people to help prevent these types of crimes by properly locking and securing their property.

Richmond, Virginia

Criminal Activity: Gunfire

Data and Analysis: Evaluated historical data on the time, location, and circumstances surrounding previous gunfire incidents.

Analysis Findings: The gunfire incidents tended to concentrate in specific areas and within an approximate time frame.

Response/Results: Resources were deployed to the hot spot areas at the appropriate times, gunfire was reduced by 47 percent, confiscated weapons increased by 246 percent, and personnel costs were reduced by $15,000.

Santa Cruz, California

Criminal Activity: Auto Theft

Data and Analysis: Used historical crime data and a predictive policing solution with a statistical algorithm to map auto theft hot spots.

Analysis Findings: The program identified the likely time frames and high-risk locations for future auto thefts including a downtown area of approximately one-square block, which contains a parking structure.

Response/Results: Officers were directed to the area, where they apprehended two suspects who were found looking into cars in the parking structure; one suspect had outstanding warrants and the other was in possession of illegal drugs.

5. PREDICTIVE POLICING AND CRIME ANALYSIS RESOURCES

Table 5-1 lists a variety of currently available predictive policing and crime analysis solutions. This information is based on Internet research and has not been verified with vendors.

While the majority of these listings are commercial off-the-shelf (COTS) products providing traditional forms of vendor support, a number of freeware solutions are also available. Most freeware solutions provide detailed guidance or documentation on downloading files and implementing the tools but little or no user support. These solutions may also require a better understanding of GIS software and analytical modeling techniques to be used effectively. Agencies intending to implement a predictive policing solution can consider using a combination of COTS and freeware offerings to meet their specific needs.

Table 5-1. Predictive Policing and Crime Analysis Solutions

Product	Developer/Vendor Website	Description
COTS Solutions		
ATAC Workstation	Bair Analytics http://www.bairanalytics.com/software/atac	Part of a family of products, ATAC is a desktop solution that provides capabilities such as crime mapping, data mining, pattern analysis, predictive analytics, and investigation CompStat reporting.
CrimeView®	The Omega Group http://www.theomegagroup.com/police/crime_mapping_solutions.html	Part of a family of products, CrimeView is a desktop solution that provides capabilities such as hot spot mapping, spatial trend analysis, threshold alerts, repeat calls, and CompStat reporting.

Product	Developer/Vendor Website	Description
Data Detective	Sentient http://www.sentient.nl/?dden	A data mining software product with capabilities such as social network analysis, statistical and predictive modeling, and geographic analysis.
GeoTime®	Oculus http://www.geotime.com/	A data visualization and analysis product with capabilities such as multi-layered mapping, pattern recognition, space-time event and entity tracking, temporal link analysis, cell site (towers and sectors) analysis, and crime series analysis.
HunchLab	Azavea http://www.azavea.com/products/hunchlab	A web-based solution with capabilities such as crime mapping and analysis, data mining and pattern recognition, space-time risk forecasting for crime types within a jurisdiction, and geographic early warning alerts.
IBM SPSS	IBM http://www-01.ibm.com/software/analytics/spss/11/na/cpp/	A family of statistical and predictive analytics tools with capabilities such as data collection and mining, pattern and trend detection, predictive model building, forecasting, and social media analytics.
IMPACT™	Overwatch/Textron Systems http://www.overwatch.com/products/impact.php	A data mining and analysis tool with capabilities such as hot spot mapping, data collection and fusion, pattern recognition, temporal and predictive analysis, link analysis and visualization, and mobile device analysis.
Law Enforcement Analytics	Information Builders http://www.informationbuilders.com/solutions/gov-lea	A customizable product suite that combines a variety of features and capabilities including interactive GIS mapping, data mining, cross-jurisdictional criminal database searches, ad hoc and predictive analytics, and visual crime analysis dashboards.
MapInfo Crime Profiler	Pitney Bowes http://www.pb.com/software/Location-Intelligence/MapInfo-Suite/MapInfo-Crime-Profiler.shtml	A crime mapping and analytics product with capabilities such as hot spot mapping, interactive analytical tools, temporal analysis, and crime proximity analysis based on the location of known offenders or other risk factors.
Maptitude	Caliper http://www.caliper.com/Maptitude/Crime/default.htm	A crime mapping and analysis solution that can also evaluate crime prevention efforts, assist dispatch with routing officers, and disseminate information to the public through web-based maps.

Product	Developer/Vendor Website	Description
Palantir Law Enforcement	Palantir http://www.palantir.com/solutions/law-enforcement/	A law enforcement solution that enables users to access structured and unstructured data, map and view statistical data and diagrams on the web, analyze intelligence, work collaboratively on investigations, manage cases, create reports, etc.
PredPol®	PredPol http://www.predpol.com/	A predictive policing solution that detects and maps spatial and temporal probabilities of future crime incidents, estimates risks associated with different types of crimes, helps determine deployment patterns, and presents analytical findings to officers and decision-makers.
PROphecy	MobileTec http://www.mobiletec.net/index.php?option=com_content&view=article&id=18&Itemid=52&lang=en	A crime analysis package licensed from ABM, Inc., PROphecy maps event, report, and incident data from MobileTec's InMotion™ products and can be used to perform functions such as incident sequence analysis and predictive analysis.
SAS®	SAS http://www.sas.com	A family of data management, statistical modeling, and analytical tools with capabilities such as data mining, pattern recognition, trend detection, predictive analytics, and social network analysis.
Signature Analyst™	Digital Globe http://www.geoeye.com/products/insight/analytic-professional-services#overview	A predictive analytics tool that helps law enforcement practitioners examine criminal activities geospatially, identify factors influencing crime, detect patterns, and deploy resources.
Freeware Solutions		
CrimeStat®	Ned Levine & Associates http://www.nedlevine.com	Developed with NIJ grants, this Windows®-based spatial statistics program provides a number of tools for analyzing crime incident locations. Available for download at the vendor's website.
GeoDa	Arizona State University https://geodacenter.asu.edu/	A group of software tools that can be used to perform spatial modeling and analysis of crime. Available for download at the vendor's website.

Product	Developer/Vendor Website	Description
Near-Repeat Calculator	Temple University http://www.temple.edu/cj/misc/nr/	Developed with an NIJ grant, this tool uses crime data to determine the risk of near-repeat incidents occurring. Available for download at the vendor's website.
Risk Terrain Modeling	Rutgers University http://www.rutgerscps.org/rtm/	A spatial risk analysis approach that examines various social and environmental conditions of an area and creates maps of individual and composite crime risk factors to determine the likely location of future incidents based on geography, not past events. Free manuals, an audiovisual demonstration, and other resources are available for download at the vendor's website.
SPIDER	South Carolina Research Authority (SCRA) and the University of Kentucky http://www.criminalbehavior.com/SPIDER.html	Developed with an NIJ grant, this Windows-based program performs spatial and temporal analysis and can be used by agencies to help in investigations of a series of linked crimes. Available for download at the vendor's website.

6. CONCLUSION

Predictive policing solutions give law enforcement agencies an array of tools designed to facilitate and enhance the process of performing crime analysis, interpreting data, formulating strategic responses, and evaluating the effectiveness of a response. GIS mapping tools are a key component of these products because they provide stakeholders at all levels within agencies a quick and dynamic means for visualizing where and when crimes have occurred and are likely to occur in the future.

Perhaps the greatest benefit of predictive policing solutions is their capacity for processing the vast amounts of data used by today's crime analysts. By examining crime and non-crime data, analysts can hopefully obtain a more holistic view of unlawful activities in their jurisdictions, make better forecasts, and even help prevent some crimes from happening. Naturally, predictive policing solutions will not eliminate crime, but they can provide a viable means for law enforcement agencies to work more effectively with limited budgets and resources.