



Crime Analysis for Non-Criminal Justice Researchers

How to find and utilize data to inform community public safety initiatives

Have you done research, analysis, and evaluation before, but never related to crime? Have you evaluated a criminal justice program, but not are not familiar with the wide variety of official data on calls, crimes, and arrests? If so, then this guide is for you.

Because BCJI brings together diverse partners such as law enforcement, researchers, community groups, and residents, it is useful for local partners to have an understanding of the wide variety of official crime data that can support their work, as well as reports based on this information. This paper will help anyone become familiar with crime analysis and how it can help a BCJI coalition examine problems, assess evidence-based solutions, and monitor progress.

Development of Crime Analysis

Although the term, “crime analysis” was not introduced in policing literature until the 1960s, the techniques associated with it have been in use since the 19th century. According to *Crime Analysis with Crime Mapping* by Rachel Boba Santos, crime analysis is “the systematic study of crime and disorder problems as well as other police-related issues—including sociodemographic, spatial, and temporal factors—to assist the police in criminal apprehension, crime and disorder reduction, crime prevention, and evaluation.”

Typically, the term crime analysis brings to mind police statistics and maps. While this is not wrong, it is only a partial view of the work of a crime analyst. Per the International Association of Crime Analysts, there are four primary types of crime analysis:

Tactical crime analysis of police data helps develop short-term law enforcement patrol and investigative priorities and resource deployment. It focuses on immediate patterns and series, with the goal of devising quick tactics to deter or apprehend an offender.

Strategic crime analysis of data develops and evaluates long-term strategies, policies, and prevention techniques. This analysis focuses on trends, problems, and their causes.

The BCJI Approach

These powerful themes run through all BCJI projects.

DATA-DRIVEN

BCJI targets crime hot spots – often streets, properties or public spaces in communities that have struggled with crime for years. Researchers are engaged in the day-to-day work, helping partners examine problems, assess evidence-based solutions, and monitor progress.

COMMUNITY-ORIENTED:

BCJI champions active roles for residents in identifying problems, selecting strategies and creating safe and healthy environments.

SPURS REVITALIZATION:

BCJI tackles problem properties, unsafe streets and parks, unemployment, transit barriers and service gaps related to crime.

BUILDS PARTNERSHIPS:

BCJI taps the resources of public, nonprofit and community leaders to bring more resources and different approaches to bear on longstanding crime challenges for lasting change.

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Administrative crime analysis (also known as operations analysis) is directed towards the administrative needs of the police agency, its government, and its community, studying the police's operations and policies—including allocation of personnel, money, equipment, and other resources—to determine what has the greatest impact on crime and disorder.

Crime intelligence analysis of data is about people involved in crimes, particularly repeat offenders, repeat victims, and criminal organizations and networks. Intelligence analysts hunt for leads on the structure and hierarchy of criminal groups, the flow of money and goods, relationships and contacts, current activities and plans, and personal information about the participants.

When you need access to data about crime, the first step should be to a crime analyst in the local police or sheriff's department. Whether you need actual data (pulled from police databases) or summary data (presented as statistics or maps), a crime analyst is the go-to person. Most medium to large agencies have at least one crime analyst, if not an entire team, and even some small police departments have one person assigned to the crime analysis function.

Within a police department, a crime analyst may be a civilian or sworn position. Civilian analysts are more likely to have strong backgrounds in GIS and other analytical computer programs (e.g., SPSS/SAS, Access, SQL). In contrast, sworn analysts typically have spent some portion of their career as a patrol officer or detective and have greater familiarity with the community and crime problems.

You may also find that academic researchers can serve in a modified crime analysis function. In some instances, particularly with small police departments or for projects with special analysis needs, an academic may work in partnership with the police department to fulfill this role.

The Heart of Crime Analysis: Data

Analysis of crime is built on data. Many crime analysts conduct regular reviews of crime report data to identify patterns that indicate specific problems. Alternatively, they may be informed of a potential problem by officers or command, and they will query the various systems to see if that information is supported. The primary sources of police data are:

- Calls for service
- Crime reports
- Arrests

Analysts may also look to field interview (FI) reports, collision data, gang and graffiti databases, or other specialized police data sources.

After an initial review of in-house data, crime analysts can turn to other sources in the criminal justice system to gain more insight into a particular problem, including their local probation and parole departments or prosecutor's offices. They may also ask other law enforcement agencies within the jurisdiction (for example, state or county police, sheriff's departments, and hospital or university police departments), as well as law enforcement partners in the region, or of similar size and demographic characteristics elsewhere.

How Do You Get Data without a Crime Analyst?

There may be an occasion where you need data from the police or sheriff's department and they do not have a crime analyst. Sometimes you will be referred to an IT person and other times to a sworn officer in charge of their records management system (RMS). Don't despair, it just might take a little more work to get exactly what you need. Be sure to spell out exactly what data you're interested in (crimes, arrests, calls for service), what fields (case number, location, call type, date, time, etc.) and in what format (not PDF). Sometimes, because they typically produce standardized reports, these personnel may not be familiar with how to get raw data out of their systems, but usually the IT systems have a way to query and extract it. You may need to be persistent, but eventually you will find the right person for the task.

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Note that all of these law enforcement sources will be reporting data solely from incidents that have been reported to or by the police. Yet the National Crime Victimization Survey (NCVS) estimates that approximately 42 percent of all serious violent victimizations and 60 percent of property crimes are not reported to the police, particularly if the offenses are considered “victimless,” if the victim is also an offender, if the victim is in the country illegally, or in instances of domestic violence. You should be aware of the potential of underreporting in your community and may want to use alternative methods to identify criminal activity that might not be reported to the police—for example, working with local social service providers that might have contacts with victims who are afraid of reporting the offenses.

There is also a wealth of information that a crime analyst can collect from outside the criminal justice system. This could include data from other government agencies, such as code enforcement or the health department. If the analyst is looking into problems involving violent crimes, he might consider contacting local hospitals or urgent care facilities. Community data, particularly collected by business or neighborhood associations, may also be useful, and the U.S. Census provides a vast amount of details about the sociodemographic, economic, educational, and transportation characteristics of communities.

Analysts may also find it necessary to go out and collect their own data, visiting crime sites to conduct physical surveys of the areas, for example, and/or conducting crime prevention through environmental design (CPTED) surveys. Analysts may also develop surveys for individuals in the community, victims of crimes, or offenders to answer specific questions about why crime might be occurring in a specific location and/or to specific victims or targets. For more information on surveying communities, visit the [website](#) of the Center for Evidence-Based Crime Policy.

Another Resource: National Surveys

National Crime Victimization Survey: NCVS is a method of measuring crime rates that draws data from surveys rather than from police agencies, attempting to produce a more accurate picture of total crime, rather than solely what is reported to police. The NCVS surveys 100,000 individuals aged 12 or over and collects data on types of crimes they have experienced, locations, times, physical settings, and characteristics of victims.

Uniform Crime Reporting: UCR is a U.S. standard of classifying and reporting crime that applies uniform categorizations to events and ensures that statistics reported by one jurisdiction are comparable to those reported by another.

National Incident-Based Reporting System: NIBRS is a national data-reporting standard instituted by the FBI that builds on the older UCR program. NIBRS requires agencies that volunteer to participate to submit individual records, with several dozen variables, on certain types of crimes. It allows for more in-depth analysis than UCR data, but is more time-consuming for agencies to collect and transmit.

It is the lucky research project that has no problems with data. Problems that often emerge, typically shortly after a grant has been awarded, include:

- Data is not available for the entire time period under study.
- Data is stored in multiple (potentially non-compatible) systems.
- Investigative reports, FI cards, and other useful resources are not saved in computerized databases.
- Data is not geocoded.
- Data is exported in a format not conducive to analysis (such as multiple lines per record).

In some instances, research projects identify problems with data that law enforcement analysts, officers, and command were unaware of. Officers may not be documenting all the aspects of a situation that are useful or necessary, for example, or computer systems may not allow for the analysis of certain variables. Depending

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on the magnitude of the problem, the project may be required to take a back seat to allow time to fix the data if possible, conduct technical updates to systems, and/or provide training for officers to record particular data. Often, these challenges can be overcome with some extra effort, but this time and work needs to be factored in before doing the analysis.

Analysis Products

The work of crime analysts primarily falls into the following four stages, each of which will create different types of products:

- 1 Identify series, patterns, trends, and hot spots as they happen
- 2 Research and analyze long-term problems
- 3 Provide information on demand
- 4 Develop and link local intelligence

In this list, crime analysts do the day-to-day work to identify the data at the start and to develop the local intelligence at the end. Researching and analyzing long-term problems occurs on an as-needed basis within the department, and providing information on demand may be cyclical (e.g. monthly statistical reports) or truly on demand (e.g. responding to data requests from citizens or members of city government).

Crime analysts working with a variety of data sets are typically proficient with spreadsheet and/or relational database programs. While small projects may allow an analyst to use Excel to incorporate data from multiple sources, larger projects will require that the data be inputted into a database that has the capacity for multiple tables to be joined and appended for analysis, such as Access or ArcGIS. The benefit of ArcGIS is that the data can then also be projected into a map of the project area, as well as spatially analyzed.

Look for Patterns

Crime analysts review data to identify groupings of crimes that may be related. In a jurisdiction with low crime levels, this could involve reviewing the reports for every crime that occurred. In a jurisdiction with high crime levels, analysts might prioritize their reviews to incidents that are most likely to be part of patterns or trends, such as property crimes, or high profile incidents, such as sexual assaults.

Crime and the 80/20 Rule

In thinking about patterns of crimes, crime analysts are led by the 80/20 rule, which suggests that a small number of people or places can be the source of a large amount of crime—an idea that is supported extensively in the research literature. Crime analysts might be asked to develop and regularly update lists of the offenders most likely to be involved in crime, as well as the places where crimes are most likely to occur or the most frequent type of victim or target. This may be part of a “Top 10” list that officers are tasked with monitoring or be part of a chronic nuisance monitoring program. In whatever format it takes, the primary goal is to identify the few people and places that are contributing to the most crime. Programs and projects are then developed within the agency to work to reduce or eliminate crime in those places or with those people.

Unlike basic crime statistics, crime analysis requires the interpretation of data, typically with recommendations for responses. Interpretations of data are subjective. The best crime analysts will present findings in a variety of ways, so that multiple ideas and options may be considered. For instance, if you are looking at counts of crimes, also look at rates and compare ratios (with an eye towards the proper denominator—such as number of motel rooms, parking spots, or residences, instead of solely population). If you are examining hot spot maps, ask to see maps with different variations on density or search radius as well as the specific problem

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locations. By looking at different sources of data and examining problems in different ways, you will have a greater chance of identifying the source(s) of your crime problem.

Once a pattern of crimes is initially identified, the analyst will conduct a wider search to identify as many cases as possible that are of a similar nature and/or in the same area. The analyst will also work to identify if the pattern can be called a spree (several similar incidents in a short time period, such as a few hours), a series (several similar incidents committed over several days or weeks), or a hot spot/pattern (several incidents in one location or area over a longer time period). The analyst can look for similarities in the incidents, considering temporal, spatial, and offender characteristics.

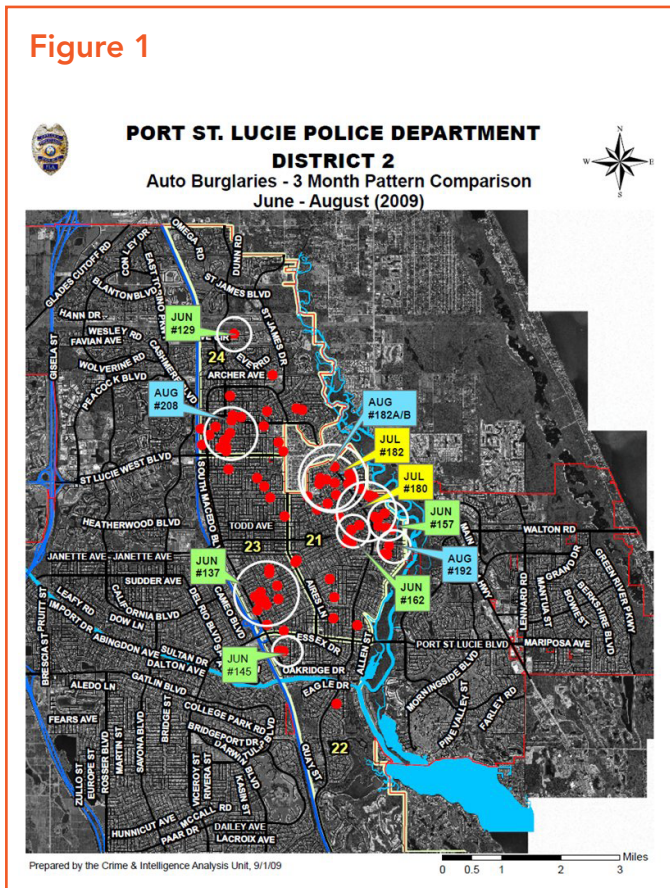


Figure 1 is a map of auto burglaries in Port St. Lucie, FL, for a three-month period in 2009. The fact that the bulk of auto burglaries does not remain in one place from month to month, but is moving throughout the police district, may be useful as a trend that informs the police and community response.

Figure 2

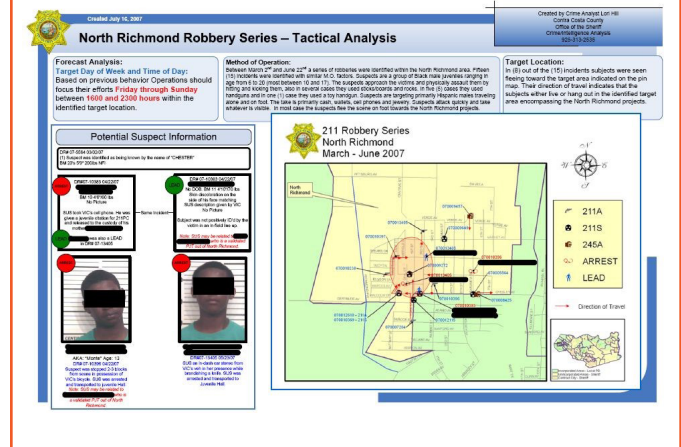


Figure 2 is a tactical bulletin highlighting the details related to a robbery series in a community in Contra Costa County, CA. The bulletin provides an extensive discussion of the crimes that have been linked to the series, including M.O., spatial information, and information about a potential suspect. It also provides a forecast for when future events might occur, based on previous incidents. The amount of details that are provided in an analytical product will be limited to available documentation, such as incident reports and victim and witness statements.

Analyze Long-term Problems

Some crime analysts may also be asked to participate in problem-solving projects that examine problems that have been an issue in the community for several years. These analyses often involve documenting the magnitude of the problem, as well as a review of any changes in rates over time and, potentially, in space.

Figure 3

2008 Annual Crime Report

Theft of GPS Devices from Cars

For the second year in a row, GPS devices are our lead story. We thought the thefts were very high in 2007, but we didn't know what "high" was. 2008 brought almost twice the number of GPS thefts that we had in 2007.

We were not the only agency to have such a problem. Similar reports have come in from agencies all across the country. From Maine to California, the existence of unattended GPS devices led to increases of 10% to 50% in the theft from vehicle category. Danvers's 42% increase in thefts from vehicles in 2008 is almost entirely explained by GPS devices.

GPSes are popular for a simple reason: they are CRAVED. This acronym, invented by criminologist Ronald Clarke, stands for Concealable, Removable, Available, Valuable, Enjoyable, and Disposable. Cash and credit cards, two of the most popular theft targets, meet almost all these criteria. Big-screen televisions, on the other hand, are rarely stolen despite their value and enjoyability because they are not very concealable or removable.

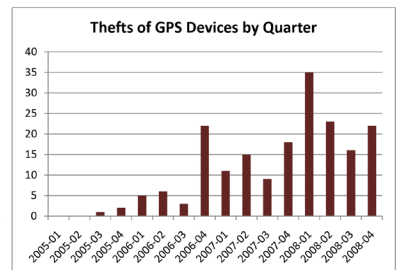
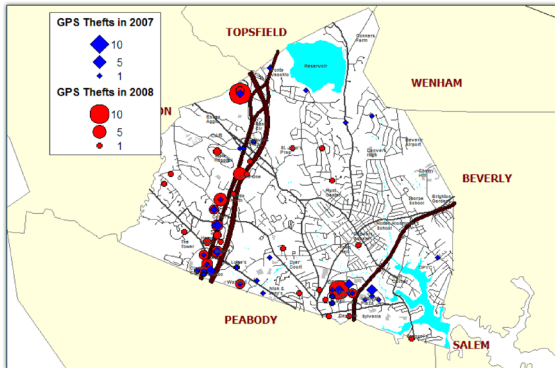


Figure 3, *continued*

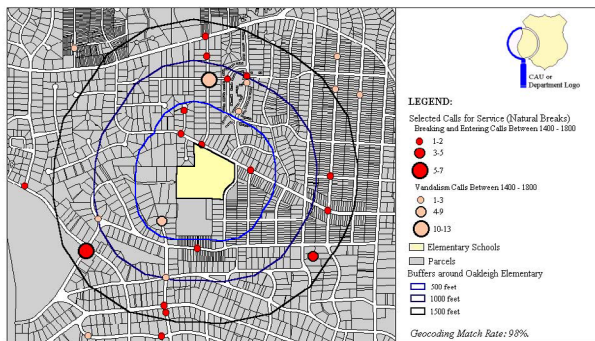


⁷ Ronald Clarke, *Hot Products: Understanding, Anticipating, and Reducing the Demand for Stolen Goods* (London: Home Office, 1999).

Figure 3 is an excerpt from an annual report that provides information about the ongoing issue of thefts of GPS devices from vehicles in the community when this was a growing problem for many jurisdictions. It depicts both the increase in thefts over time and in space and also provides a discussion of the incidents.

Figure 4

Selected Calls for Service within 1500 feet of Oakleigh Elementary
September 1, 2000 - May 31, 2001



Map prepared by the Crime Analysis Unit on [Date].

Figure 4 documents calls for service surrounding an elementary school, documenting an issue of vandalism and breaking and entering that is believed to be linked to the students attending the school. The map identifies where the incidents are occurring, potentially linking the incidents to the primary pathways that students take to and from the school.

Provide Information

Crime analysts are also asked to provide information about crime. These requests may take a variety of forms, but likely include standing requests from city/town councils for periodic crime statistics and requests from citizens for data about specific crime concerns. The products developed in response to these requests typically focus on providing data in the form of tables and charts.

Figure 5

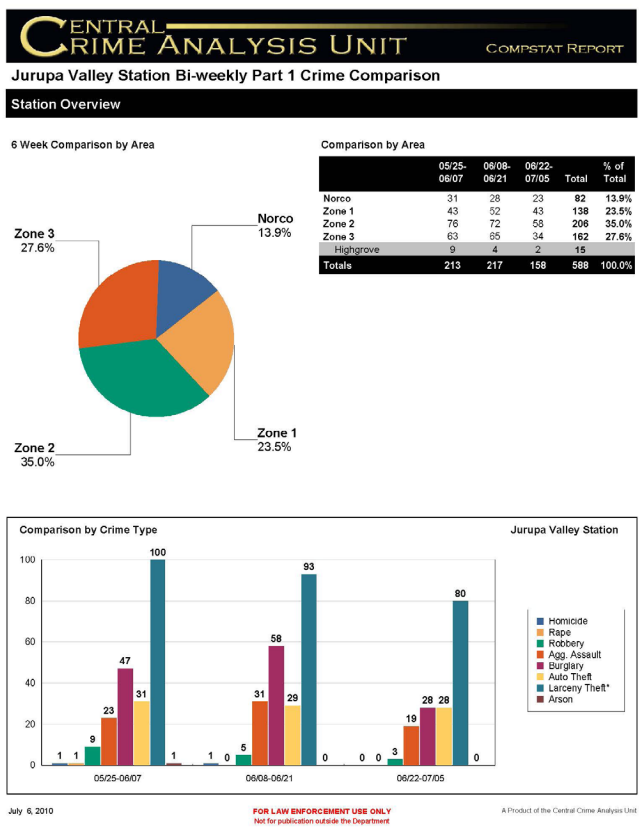


Figure 5 shows a bi-weekly statistical report for Part 1 crimes, defined by the FBI for the Uniform Crime Report, including murder, rape, robbery, aggravated assault, burglary, larceny-theft, and vehicle theft. The information is presented with a table, pie chart, and bar chart, comparing several weeks of data from across four different areas, allowing the reader to consider the data in a variety of different ways.

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Crime Analysis: Key Words and Phrases

Like for any profession, crime analysts have their own terminology for their work. Below is a brief listing of definitions often used in crime analysis that may be useful to know as you partner on projects with these professionals, adapted from the International Association of Crime Analysts' *Exploring Crime Analysis: Readings on Essential Skills* (2nd Ed).

Analysis: 1) The element of reasoning that involves breaking down a problem into parts and studying the parts; 2) A process that transforms raw data into useful information.

Call for service: A term that, depending on the agency, can mean: 1) a request for police response from a member of the community; 2) any incident to which a police officer responds, including those that are initiated by the police officer; or 3) a computerized record of such responses.

Computer-aided dispatch (CAD): A computer application, or series of applications, that facilitates the reception, dispatching, and recording of calls for service. Data stored in CAD systems include call type, date and time received, address, name and number of the person reporting, as well as the times that each responding unit was dispatched, arrived on scene, and cleared the scene. In some agencies, CAD records form the base for more extensive incident records in the **records management system** (RMS).

Crime mapping: The application of a **geographic information system** (GIS) to crime or police data.

Crime report: A record (usually stored in a **records management system**) of a crime that has been reported to the police.

Crime series analysis: The process of reviewing police reports/data with the goal of identifying and analyzing a pattern of crimes that the analyst believes is committed by the same person or persons.

Criminal event perspective: A way of studying crime, rooted in **environmental criminology**, that considers multiple theories of offender, victim, place, and opportunity.

Environmental criminology: The study of crimes as they relate to places and the contexts in which they occur, including how crimes and criminals are influenced by environmental—built and natural—factors. Environmental criminology is also the heading for a variety of context-focused theories of criminology, such as routine activities, crime pattern theory, crime prevention through environmental design, situational crime prevention, and hot spots of crime.

Forecasting: Techniques that attempt to predict future crime based on past crime. Series forecasting tries to identify where and when an offender might strike next, while trend forecasting attempts to predict future volumes of crime.

Geocoding: The process of converting location data into a specific spot on the earth's surface, such as an address, into latitude/longitude. In law enforcement, most references to

geocoding refer to one type of geocoding known as "address matching."

Geographic information system (GIS): A collection of hardware and software that collects, stores, retrieves, manipulates, analyzes, and displays spatial data. The GIS encompasses the computer mapping program itself, the tools available to it, the computers on which it resides, and the data that it accesses.

Hot spot: 1) An area of high crime or 2) events that form a cluster. A hot spot may include spaces ranging from small (address point) to large (neighborhood). Hot spots might be formed by short-term **patterns** or long-term **trends**.

Modus operandi: Literally, "method of operation," the m.o. is a description of how an offender commits a crime. **Modus operandi** variables might include point and means of entry, tools used, violence or force exerted, techniques or skills applied, and means of flight or exit. Studying **modus operandi** allows analysts to link crimes in a series, identify potential offenders, and suggest possible strategies.

Pattern: Two or more incidents related by a common causal factor, usually an offender, location, or target. Patterns are usually, but not always, short-term phenomena. See also **series**, **trend**, and **hot spot**.

Problem: 1) An aggregation of crimes, such as a **pattern**, **series**, **trend**, or **hot spot**; 2) Repeating or chronic environmental or societal factors that cause crime and disorder.

Records management system (RMS): A computerized application in which data about crimes and other incidents, arrests, persons, property, evidence, vehicles, and other data of value to police are entered, stored and queried.

SARA: Scanning, Analysis, Response, and Assessment (SARA) is a problem-solving model for systematically examining crime and disorder problems and developing an effective response.

Series: Two or more related crimes (a **pattern**) committed by the same individual or group of individuals.

Signature: A personalized way of committing a crime that goes beyond **modus operandi**, usually not necessary to the commission of the crime but rather fulfilling a psychological need. An offender's signature links crimes in a **series**.

Temporal analysis: The study of time and how it relates to events.

Trends: Long-term increases, decreases, or changes in crime (or its characteristics).

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Other Resources

There are a number of useful resources that explore the work of crime analysts in depth.

Publications

- *Crime Analysis for Problem Solvers in 60 Small Steps*
Ronald Clarke and John Eck
www.cops.usdoj.gov/pdf/crimeanalysis60steps.pdf
- *Mapping Crime: Understanding Hot Spots*
John Eck, Spencer Chainey, James Cameron,
Michael Leitner, and Ronald Wilson
www.ncjrs.gov/pdffiles1/nij/209393.pdf
- *Exploring Crime Analysis: Readings on Essential Skills*
The International Association of Crime Analysts
www.iaca.net/exploring_crime_analysis.asp
- *Crime Analysis with Crime Mapping*
Rachel Boba Santos
us.sagepub.com/en-us/nam/crime-analysis-with-crime-mapping/book244023

Classes

An increasing number of colleges and universities offer crime analysis-related classes (as distinct from criminology or criminal justice). We recommend an internet search for a college or university in your area or via online.

The IACA offers in-person classes as well as online trainings and webinars on a wide variety of topics. More info can be found at <http://iaca.net/training.asp>.

Internet Resources

- International Association of Crime Analysts
www.iaca.net/
- Center for Problem-Oriented Policing
www.popcenter.org/
- Center for Evidence-Based Crime Policy – Crime and Place
cebcp.org/crime-and-place/
- Center for Evidence Based Crime Policy – Community Surveys
cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/surveying-communities/

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