

Crime Analyst's Research Digest

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Hot-Spot Policing

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Introduction

Dear IACA members,

Welcome to the first edition of the Crime Analyst's Research Digest! Our hope with this quarterly publication is to provide a source of useful information to crime analysts on relevant scholarly research. The general format will feature one-page summaries of research papers reviewed by researchers and practitioners who are knowledgeable in the field. The goal is to provide busy professionals with a quick glimpse of relevant research articles without having to spend valuable time and effort locating and reviewing them individually.

What you will find in this first issue is a compilation of research article summaries that focus on hot-spot policing, a topic that periodically generates a variety of comments and perspectives on the IACA listserv. Hot-spot policing is a relatively recent, but proven strategy for focusing police efforts on places with the highest amount of crime reports or calls for service. Hot-spot mapping has become one of the more fundamental methods of crime analysis and can provide a quick overview of where problems are occurring and where police resources are needed. Several of the summaries included in this issue reference major hot-spot studies such as the Minneapolis Hot-Spots Patrol Program, the Philadelphia Foot Patrol Experiment, and the Kansas City Gun Experiment. These and other research studies helped shape the basic foundations of hot-spot policing as we currently know it.

Despite its seemingly straightforward utility, the complexities of hot-spot policing are not without some questions. For example, Braga found that directed hot-spot patrols generally reduced crime but it is unknown how that would have compared to traditional policing tactics. Variations in the type of crime may also affect the outcome of hot-spot policing strategies, as Sherman and Weisburd discovered in their research. They found that "soft" crime decreased, but "hard" crime increased or remained the same. We hope that by providing a variety of perspectives, you will develop a better understanding of hot-spot policing.

To this end, each quarterly digest will alternate between a specific topic (such as hot-spot policing) and general crime analysis articles. A sampling of the summaries in this issue include:

- The Effects of Hot-Spot Policing on Crime
- Police Enforcement Strategies to Prevent Crime in Hot Spot Areas
- The Crime Reduction Effects of Foot Patrol in Violent Crime Hot Spots
- Just Enough Police Presence: Reducing Crime and Disorderly Behavior by Optimizing Patrol Time in Crime Hot Spots

This effort involved a lot of work by the reviewers, as well as by the other members of the IACA Publications Committee: Noah Fritz, Samantha Gwinn, and Julie Wartell.

We hope you enjoy the result of our first effort and find it useful. We'd love to get feedback for future digests. If you are interested in serving as a reviewer, have recommendations on relevant articles, or have any comments or suggestions for improvement please, send them to us at publications@iaca.net.

Tom Scholten
Editor, Crime Analyst's Research Digest
IACA Publications Committee

The Effects of Hot Spots Policing on Crime

Anthony A. Braga

Summary by Tamara Madensen, University of Nevada, Las Vegas

Summary

This study reviews existing literature on police patrol in crime hot spots. A systematic assessment of the preventative value of police enforcement interventions at high-crime locations is presented.

Data and Methods

Systematic searches of online databases, narrative and empirical literature reviews, and research article bibliographies were used, in conjunction with contacts with leading researchers, to identify the nine studies included in this review. To be considered, studies had to meeting the following criteria:

- used an experimental or quasi-experimental design with a no-treatment control group involving before and after measures;
- the interventions were focused on specific hot spots, meaning places smaller than a neighborhood, community, or police beat;
- the interventions were limited to police enforcement efforts (e.g., directed patrol, traffic enforcement, aggressive disorder enforcement, problem-oriented policing interventions primarily involving police); and
- the effects of police intervention were measured using officially recorded levels of crime at places (e.g., incident reports, calls for service, arrest records).

Findings

This study produced three major findings.

1. Seven of the nine studies reported significant reductions in crime and disorder.
2. The two studies that did not find crime reductions suffered from noteworthy methodological problems.
3. Five of the nine studies examined potential displacement effects. None reported substantial immediate spatial crime displacement. Four found possible evidence of a benefits diffusion effect, with crime and disorder decreasing in surrounding areas.

In general, this study finds that directed police efforts in hot spots can reduce crime. There are two general limitations of this study. First, the analyses do not reveal which types of police strategies are most effective in preventing crime or under what types of conditions. Second, the analyses do not show the degree to which the traditional police tactics used in the selected studies are more or less effective than other types of broader community problem-solving policing programs.

For more information see Braga, Anthony A. (2001). The Effects of Hot Spots Policing on Crime. *Annals of the American Academy of Political and Social Science*, 578(1), 104-125.

General Deterrent Effects of Police Patrol in Crime Hot Spots: A Randomized, Controlled Trial

Lawrence W. Sherman and David Weisburd

Summary by Tamara Madensen, University of Nevada, Las Vegas

Summary

This study examines the relationship between levels of uniformed police patrol and crime in hot spots. It was designed to improve upon the research design used in the Kansas City Patrol experiment by focusing on smaller units of analysis: hot spots of crime rather than police patrol beats. This design allowed more precise measures of police patrol levels at specific locations and increased the potential sample size to more accurately assess the impact of police presence on crime.

Data and Methods

In Minneapolis, 110 address clusters that generated 20 or more significant calls for police service in a one-year period were selected for the study. Of these clusters, 55 (n = 832 individual addresses) were randomly selected to receive 3 hours more of police patrol between 1100 hours and 0300 hours. The remaining 55 locations (n = 831 individual addresses) received standard levels of police patrol and served as the control groups. Field observations of police presence and crime were made in the 100 most active hotspots (50 experimental and 50 control) over a 6 ½ month period. Patrol logs and citizen calls for service were also used to measure police presence and crime, respectively.

Findings

The ratio of time spent by police in the experimental hot spots compared to the control hot spots was 2.3 to 1. The researchers find a place-specific “micro-deterrence” effect of increased patrols on crime. Calls for service data show that experimental hot spots experienced significantly less “soft” crime, although “hard” crime levels were statistically the same. Site observations found 25 percent less disorder in the experimental hot spots when compared to the control hotspots. In particular, the largest decreases were found in the categories of person down (on the ground), drug activity, vandalism, solicitation for prostitution, and assault.

The researchers conclude that “These results show clear, if modest, general deterrent effects of substantial increases in police presence in crime hot spots” (p. 645). One major limitation of this study is that it did not examine possible displacement effects.

For more information see Sherman, Lawrence W., & Weisburd, David. (1995). General Deterrent Effects of Police Patrol in Crime Hot Spots: A Randomized, Controlled Trial. *Justice Quarterly*, 12(4), 625-648.

Police Enforcement Strategies to Prevent Crime in Hot Spot Areas

Anthony Braga

Summary by Eric L. Piza, Ph.D. candidate, Rutgers University

Summary

The ways by which crime concentrates in time and space are one of the most well-researched topics in criminology. The concentration of crime in distinct hot spots has practical implications for policing by suggesting that geographically-focused police efforts can yield greater gains than the uniform deployment of personnel throughout a jurisdiction. This paper tests this assumption through a meta-analysis of prior hot-spots policing initiatives.

Data and Methods

This article reviewed all available academic studies evaluating hot spots policing programs. Studies were selected based on specific criteria: 1) the program was limited to police enforcement efforts, 2) the program focused on small areas, such as street corners, homes, apartment buildings, and subway stations, and 3) the evaluation utilized a rigorous design, such as randomized experiments and quasi-experiments. Following this criteria, nine studies were selected for inclusion:

- Minneapolis Repeat Call Address Policing (RECAP) Program (Sherman et al., 1989)
- Minneapolis Hot-Spots Patrol Program (Sherman & Weisburd, 1995)
- Jersey City Drug Markets Analysis Program (DMAP) (Weisburd & Green, 1995)
- Jersey City Problem-Oriented Policing at Violent Places Project (Braga et al., 1999)
- St. Louis Problem-Oriented Policing (POP) in Three Drug Market Locations Study (Hope, 1994)
- Kansas City Gun Project (Sherman & Rogan, 1995a)
- Kansas City Crack House Police Raids Program (Sherman & Rogan, 1995b)
- Houston Targeted Beat Program (Caeti, 1999)
- Bennleigh (Australia) Calls for Service Project (Criminal Justice Commission, 1998)

Findings

Noteworthy crime reductions were reported in seven of the nine selected studies. In the case of the Minneapolis RECAP program, the lack of crime reduction was attributed to an excessive number of addresses being assigned to the program, making officers unable to devote sufficient time to each target area. The Jersey City POP at Violent Places study and the Kansas City Gun Project reported the strongest crime control benefits. Five of the studies examined crime displacement and diffusion of crime control benefits. None of the five studies report significant spatial displacement of crime with four suggesting possible diffusion of benefits effects. The results of this meta-analysis support the use of hot-spot policing.

For more information see: Braga, A (2008). Police Enforcement Strategies to Prevent Crime in Hot Spot Areas. U.S. Department of Justice Office of Community Oriented Policing Services. Washington D.C.

Offender as Forager? A Direct Test of the Boost Account of Victimization

Shane D. Johnson, Lucia Summers and Ken Pease

Summary by Chelsea Slater, University of Birmingham

Summary

Starting from the adage “in the right place at the right time,” this study looks into the interaction of time and location regarding two types of acquisitive crimes: burglary and theft from motor vehicles (TFMV). A possible explanation of space-time clustering that has been observed in previous studies is the consequence of offenders using efficient foraging strategies. The offender as a forager is balancing an acceptable amount of risks and rewards when choosing where to commit his crime, and there are certain advantages for him in choosing locations close to each other geographically and spatially. This study examines whether foraging behaviors apply to different types of acquisitive crimes.

Data and Methods

The Bournemouth police basic command unit’s records from January 1, 2001, and December 31, 2005, were analyzed. The detection rates for both residential burglary ($N=1,410$) and TFMV ($N=815$) were relatively high compared with previous studies due to the inclusion of crimes that are taken into consideration (TICs). TICs are offenses brought to police attention by an offender when he or she is being charged with other offenses. For each crime, the data included the location of the offense (accurate to within 1 meter) and the date of the offense. The method of analysis was a variation of the epidemiology test for disease contagion. Each crime was compared to every other crime to calculate the distance in space in time.

Findings

The data shows that a crime is more likely to occur at a particular location if another crime took place recently and nearby, rather than certain areas being hotspots. There are more crimes that occur near each other in space and time than would be expected if there were no relationship between space and time. Especially significant for burglaries are events that occur within 400 meters and 42 days of each other. TFMV showed a similar pattern but with greater distances between offenses. These spatial and temporal patterns for acquisitive crime are consistent with the theory of the offenders engaging in foraging activities. Both types of crime found that crimes that were close in time and space were linked to the same offender. There was also no support for the thought that the space-time distribution of one type of crime was linked to that of the other. The results of this study have clear implications for the generating of crime forecasts. A crime forecast that considers both time and location of past crimes improves the predictive accuracy relative to standard methods of crime hot-spotting. It is also reasonable to infer that these findings could be used in the linking of undetected crime, in that those that occur close to each other in space and time will possibly be the work of the same offender.

For more information see Johnson, S.D., Summers, L., & Pease, K. (2009). Offender as forager? A direct test of the boost account of victimization. *Journal of Quantitative Criminology*, 25 (2), 181-200.

The Effects of Increased Gun Seizures on Gun Violence in Crime Hot Spots

Lawrence Sherman and Dennis Rogan

Summary by Evan T. Sorg, Center for Security and Crime Science, Temple University

Summary

Gun violence continues to plague American communities. For example, the Philadelphia Police Department reports that from January through June 2011, 674 individuals were the victims of shootings, with 127 victims ultimately succumbing to their wounds. The Kansas City Gun Experiment designed and evaluated by Lawrence Sherman and Dennis Rogan and carried out by the Kansas City Police Department, explored the hypothesis that increasing gun seizures in hot spots of gun violence would reduce the level of gun crimes. The authors theorize that by increasing gun seizures, gun violence could decline as a result of two possible mechanisms: deterrence and incapacitation. Deterrence theory suggests that increasing gun seizures would make illegal gun carriers less likely to possess the gun in public for fear of being caught. Incapacitation, on the other hand, would make it impossible for gun criminals to commit additional gun crimes due to arrest and/or their weapons being seized.

Design and Methods

The Kansas City gun experiment was a quasi-experimental test which compared the impact of increased patrol in one hot spot with “business as usual” in a control hot spot. For 29 weeks, a pair of two-officer cars patrolled from 1900 hours to 0100 hours, seven days per week, with an explicit focus on proactive patrol to recover firearms (they did not answer calls for service). The officers reported spending approximately 3.27 hours per shift patrolling the hot spot. The target area was an 8 by 10 block area with a very high level of gun crime. Specific tactics varied, but firearms were recovered through tactics such as stop-and-frisk and searches incident to arrests. The data were analyzed with various statistical methods, including t-tests, analysis of variance and time series analysis.

Results

The hot spot officers found a total of 29 guns during the study period, while other units recovered an additional 47 guns within the target hot spot. This level of gun recovery represented an increase of approximately 65 percent when compared to the six month period before the experiment. In contrast, the control beat saw a slight decline in gun seizures. In the target beat, gun crime decreased by 49 percent (83 gun crimes) during the deployment, a decline that was found to be statistically significant. The control beat saw a slight increase in gun crimes; however, this change was not statistically significant. Analyses of change in specific crime categories found that in the targeted beat, drive-by shootings and homicides declined from before to during the patrols, and these declines were statistically significant. The control beat saw no such differences. Although there was a modest increase in gun crime in beats adjacent to the target area, the level of change was not statistically significant. Two of the adjacent beats actually saw a statistically significant decline in gun crime.

For more information see Sherman, L.W. & Rogan, D.P. (1995) Effects of Gun Seizures on Gun Violence: Hot Spots Patrol in Kansas City, *Justice Quarterly*, 12(4): 673-693.

The Crime Reduction Effects of Foot Patrol in Violent Crime Hot Spots

Jerry Ratcliffe, Travis A. Taniguchi, Elizabeth Groff, and Jennifer Wood

Summary by Evan T. Sorg, Center for Security and Crime Science, Temple University

Summary

For some time, policing scholars have held that foot patrol has the ability to improve community perceptions of police and reduce citizen fear of crime, but that it is ineffective in actually reducing crime. This view was cemented as a result of several evaluations published in the 1980s which found no meaningful crime reductions after introducing foot patrols in a number of cities. However, these previous evaluations measured the impact of foot patrol spread across very large geographic units. More recent evaluations have found that problem-oriented policing, vehicle patrols, and other tactics can be effective in reducing crime when strategically focused in relatively small violent crime hot spots. The Philadelphia foot patrol experiment was carried out in an effort to test whether foot patrols, when similarly deployed in violent crime hot spots, could be effective in reducing crime.

Data and Methods

The Philadelphia foot patrol experiment was a randomized, controlled trial which compared the impact of foot patrol in sixty target locations to sixty control locations. In contrast to studies of foot patrol conducted in the 1980s, the target and control locations contained an average of only 1.3 miles of streets and 14.7 street intersections. Two hundred and forty recent police academy graduates patrolled the target beats on foot, in pairs, from Tuesday through Saturday on two shifts (1000—1800 and 1800—0200) for 12-22 weeks during the summer. Upon conclusion of the experiment, Temple researchers used regression models to measure the impact of the deployment on levels of violent crime. They also used the Weighted Displacement Quotient to measure any crime displacement to locations adjacent to the targets beats.

Findings

Results indicated that, relative to the control locations, beats which received foot patrols had levels of crime that were twenty three percent lower than the beats that did not. However, only the most violent beats saw statistically significant reductions in violent crime. In this experiment, beats needed to have at least 6 violent crimes in the three months prior to the experiment in order to see meaningful reductions. The analysis of displacement found that some crime did displace to adjacent locations. However, the amount of crime displaced was far less than the crime that was reduced in the targeted beats. In total, it is estimated that targeted beats experienced 90 fewer violent crimes due to foot patrol; this was offset by an increase of 37 violent crimes in the nearby locations, resulting in a net reduction of 53 violent crimes.

For more information see Ratcliffe, J.H. Taniguchi, T., Groff, E.R. & Wood, J. (2011) The Philadelphia Foot Patrol Experiment: A Randomized Controlled Trial, *Criminology*, 49(3): 795-831. Visit the Temple University Center for Security and Crime Science Website (www.temple.edu/cj/cscs) for updates and further research exploring the Philadelphia foot patrol experiment.

The Concentration of Cash-In-Transit Robbery

Sam Hepenstal and Shane D. Johnson

Summary by Jessica Woodhams, University of Birmingham

Summary

In response to rising cash-in-transit (CIT) robberies in London this study investigated how and why these crimes clustered in space. CIT robberies are defined as incidents during which the custodian or vehicle is targeted with the intent to take property. First, spatial patterns were examined for the whole of London. Following this, the researchers investigated clustering within an identified hotspot.

Data and Methods

CIT robberies that occurred across Greater London in 2007 were sampled from the London Metropolitan Police Service ($N = 599$). Date and time of offense, modus operandi, vehicle and weapon use, and type of target was recorded. Geo-coordinates were available for 550 offenses.

Pan-London Findings

The most common targets were banks, supermarkets, and other types of shops. Most robberies occurred from 1000 hours – 1800 hours with the majority occurring at lunch time. Inspection of a kernel density estimation hotspot map for the Greater London area showed these events to cluster in space. This was tested statistically through Nearest Neighbor analyses. The first-order nearest neighbor index was statistically significant, indicating that the spatial pattern of CIT robberies was not random. The authors state this is likely due to targets being clustered in specific areas.

Hotspot Methods

Of the twelve hotspots identified in the Greater London area, the hotspot selected covered the largest geographical area and contained the most incidents ($n = 25$). A visual survey of the entire hotspot was conducted whereby any potential CIT target was recorded on an Ordinance Survey map. The locations of the 440 potential targets were digitized using ArcGIS 9.1.

Hotspot Findings

The rate of CIT robbery was 6 crimes per 100 potential targets. Statistical analyses indicated that at-risk targets were closely located to major intersections despite other targets being available at greater distances from intersections. The majority of CIT robberies involved the offender(s) escaping in a vehicle; therefore, targets close to major intersections offer ease of escape. The authors note these findings are in keeping with crime pattern theory, but that they could be explained by the availability of parking spaces. The lack of parking close to major intersections would result in custodians travelling further on foot between vehicle and premise, increasing their vulnerability. Witness statements also indicated that custodians were making multiple deliveries, increasing their visual presence. Several policies were suggested including; the strategic granting of planning permission for new premises, targeted police patrols, and increased surveillance around targets close to busy intersections.

For more information see Hepenstal, S., & Johnson, S.D. (2010). The concentration of cash-in-transit robbery. *Crime Prevention and Community Safety*, 12 (4), 263-282.

Hot Spots of Predatory Crime: Routine Activities and the Criminology of Place

Lawrence Sherman, Patrick Gartin and Michael Buerger

Summary by Eric L. Piza, Ph.D. candidate, Rutgers University

Summary

This article is widely considered as the seminal text on “crime and place.” The article also contributes to the understanding of repeat victimization by focusing on individual addresses as units of analysis. The article illustrates how the focus on micro-places can produce findings more practical to crime prevention than criminology’s typical focus on large areas, such as neighborhoods or communities.

Data and Methods

The study focuses on calls-for-police service occurring in Minneapolis, MN, over a one-year period spanning from December 15, 1985 to December 15, 1986. The methodology analyzes the distribution of 323,979 calls-for-service across 115,000 unique addresses and intersections.

Findings

The findings show that few hot spots produce most calls for police service. Just over 50% of calls occurred at 3% of addresses. Concentration was even more pronounced in respect to predatory offenses. All robberies, rapes, and auto thefts occurred at 2.2%, 1.2%, and 2.7% of addresses, respectively. In respect to repeat victimization, 50% of addresses that generated a call for service did not produce more than one call. Conversely, the top 5% of addresses experienced an average of 24 calls each, or 1 every 2 weeks. These findings suggest that, even in high crime areas, a small number of places generate the majority of crime problems. Thus, an emphasis on these distinct places can generate greater crime prevention gains than focusing on aggregate geographies, such as police beats.

For more information see Sherman, L., Gartin, P., and Buerger, M. (1989). Hot spots of predatory crime: Routine activities and the criminology of place. *Criminology*, 27(1): 27-55.

Just Enough Police Presence: Reducing Crime and Disorderly Behavior by Optimizing Patrol Time in Crime Hot Spots

Paper and summary by Christopher S. Koper

Summary

This study examines the residual deterrence effects of police patrols in hot spots, or small clusters of high-crime addresses. Residual deterrence is an effect of police presence in an area which discourages disorderly and criminal behavior after police depart. This study is based on three concepts suggested by research in this area: (1) that controlling disorderly behavior can reduce fear and more serious crime; (2) that police can reduce disorder and crime by increasing their presence at hot spots where such behavior is concentrated; and (3) that the presence of an officer in a hot spot has the effect of deterring disorderly and criminal behavior even after police depart (for example, by driving troublesome people away from the area). Extrapolating from theory and research on police crackdowns, the study examines whether stronger dosages (i.e., longer instances) of police presence create stronger residual effects on crime and disorder and, if so, whether there is an optimal length for police presences at hot spots (i.e., a point of diminishing returns).

Data and Methods

The study employed observational data collected during the Minneapolis hot spots experiment. Observers visited hot spots at randomly selected times to record police presence, crime, and disorder. The analysis is based on approximately 17,000 observed instances of police presence (blocks of time when at least one officer was present at the hot spot) and 4,000 instances of observed disorderly or criminal behavior. Continuous-time, parametric survival models were employed to determine whether patrol presences of greater duration produced a longer “survival” time — i.e., a longer time without observed criminal or disorderly behavior after the police departed. The analysis focused on drive-bys and stops of up to twenty minutes. The survival time was measured using a follow-up period of up to thirty minutes following each police presence.

Findings

For police stops, each additional minute of police presence increased survival time by 23 percent. The ideal dosage for police presence was 10 to 15 minutes; a threshold dosage of 10 minutes was necessary to generate significantly more residual deterrence than was generated by driving through a hot spot. Residual deterrence effects were greatest for police presences of 14 to 15 minutes; longer presences had diminishing effects.

Implications for Policy Makers

Police can maximize crime and disorder reduction at hot spots by making proactive, 10- to 15-minute stops at these locations on a random, intermittent basis, thus maximizing deterrence and minimizing the amount of unnecessary time spent at hot spots. However, the study did not address the types of activities conducted by officers at hot spots.

For more information see Koper, C. (1995). Just enough police presence: Reducing crime and disorderly behavior by optimizing patrol time in crime hotspots. *Justice Quarterly*, 12(4): 649-672.

<http://gemini.gmu.edu/cebcp/KoperHotSpots.pdf>

Hot Spots of Juvenile Crime: A Longitudinal Study of Arrest Incidents at Street Segments in Seattle, Washington

Paper and summary by David Weisburd, Nancy A. Morris, and Elizabeth R. Groff

Summary

Research related to crime and place has indicated that crime is concentrated in very small geographic areas. This concentration is non-random and suggests some relationship between the routine activities of offenders and the location of crime incidents. Although scholars have had a long-standing interest in the places with concentrated juvenile delinquency (Shaw and McKay, 1942), studies of crime and place have rarely separated juvenile and adult offending populations. Furthermore, routine activities theory suggests that geographic restriction of juvenile activities may yield strong concentration of juvenile crime in places. These “juvenile activity spaces” — malls, schools, community centers, and so on may be important in explaining concentrations of violent juvenile crime and extremely amenable to place-based study. The authors examine the salience of crime and place theory for juvenile offenders by studying incidents of juvenile crime in Seattle, Washington.

Data and Methods

The authors use group-based trajectory analysis of stability and variability of crime at street segments for 14 years of crime incidents in which a juvenile was arrested in Seattle, Washington. The authors used arrest reports to identify all juvenile offenders to measure rates of juvenile crime during this time period and linked these arrest reports to identify crime incidents in which at least one juvenile offender was arrested. Poisson models and a group-based trajectory analysis resulted in the identification eight trajectory groups of juvenile crime.

Findings

The authors found officially recorded juvenile crime is highly concentrated in places, with 83 street segments accounting for 33% of juvenile crime and 3% to 5% of street segments responsible for all incidents during any given year. Although most trajectory groups in Seattle exhibited a general decline in rates of juvenile crime, a small number of trajectories had increasing rates of crime during the study. Trajectory groups where juvenile crime was most concentrated were much more likely to have arrest incidents at schools, malls, restaurants, and other spaces where juveniles congregate and interact without adult supervision. The authors caution that these findings could be impacted both by different police activity in certain areas and by differences in crime frequencies in this study as compared to earlier studies of crime concentrations in place.

Implications

Juvenile crime appears to be more concentrated in places than adult crime, although further research may be necessary before strong conclusions regarding the concentration of juvenile crime in places can be drawn. The concentration of juvenile crime in places may present significant opportunities for crime prevention; potentially, “place managers” could supervise juvenile interactions in activity spaces and significantly reduce rates of juvenile crime.

For more information see Weisburd, D., Morris, N.A., & Groff, E.R. (2009). Hotspots of juvenile crime: A longitudinal study of arrest incidents at street segments in Seattle, Washington. *Journal of Quantitative Criminology*, 25(4): 443-467. http://gemini.gmu.edu/cebcp/HOT_SPOTS_OF_JUVENILE_CRIME.pdf