City of Columbia (SC) Police Department Smart Policing Initiative

Final Report

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Columbia, South Carolina's violent and property crime rates were higher than national averages in 2009 and 2010, and the Columbia Police Department (CPD)—the primary law enforcement agency for the city's roughly 130,000 residents—was understaffed at the time due to budgetary concerns. Faced with the pressure to "do more with less," CPD partnered with researchers from the University South Carolina (USC) and received funding from the Smart Policing Initiative (SPI) for their *Integrated Data Exchange and Analysis* (IDEA) project. The project's initial focus was to help the agency become more "intelligence-led"—that is, to emphasize data collection and analysis in everyday police practices. However, uncertainty at the command staff level of the agency in the early months of the project presented a challenge. This forced the SPI team to focus on specific, more manageable projects that remained consistent with the ultimate goal of influencing organizational change toward intelligence-led policing (ILP).

One of the first steps the SPI team took was distributing a survey to Columbia residents in order to gauge their perceptions of community problems. The results indicated that the biggest concern among citizens was residential burglaries. Official agency data also revealed that residential burglaries were a significant problem, and so the SPI team immediately began searching for evidence-based solutions. Ultimately, the team decided to implement a tiered response to repeat and near-repeat burglaries in the North patrol region (similar to interventions carried out in the UK, Australia, and Baltimore). After an initial burglary, officers contacted victims and: (1) administered a follow-up security survey, (2) provided victims with a pamphlet providing burglary prevention tips, and (3) asked victims to email the serial numbers of their valuable possessions. To address near-repeat burglaries, homes within a one-block radius of an initial burglary received a door-hanger which advised of the recent nearby burglary and provided

burglary-prevention tips. If a residence was burglarized again during the intervention period, officers again conducted a security survey and in some cases, the victim may have qualified for a temporary alarm system. Results of the intervention indicate that there was an overall decline in burglaries in the North Region, as well as declines in both repeat and near-repeat burglaries in the intervention area.

In the fall of 2013, CPD faced enormous pressure from the public to do something about a seemingly increasing gang violence problem (gang-related issues were also identified as a key concern among residents in the community survey). The Gang Unit was understaffed (just three officers) and intelligence at the time was rudimentary. The SPI team decided to leverage the grant in an effort to begin developing a more practical and analyzable gang intelligence database. Specifically, the team used social network analysis (SNA) to better understand relationships between validated and suspected gang members in Columbia. Starting with a list of 184 validated gang members, and another roughly 200 suspected gang members, one of the USC research partners (Dr. Justin Nix) created a social network using IBM Analyst's Notebook which contained 823 individuals and 1,451 ties among them. A number of interesting findings emerged, but more importantly, CPD now has a single database for gang intelligence that is searchable and easy to update (previously, separate PowerPoint files were created for each gang member). This network can easily be used for investigative purposes in the future. Moreover, members of the command staff appeared to see the potential of using SNA as an investigative tool during presentations given by the USC research team. The next step for CPD will be to continue training its Crime Analysis Unit on Analyst's Notebook and emphasize the potential utility of SNA during investigations.

One of the necessary steps in the evaluation of the SPI grant involved an assessment of the degree to which CPD officers became more familiar with ILP and whether their willingness to use such strategies changed throughout the grant period. To do so, the SPI team administered pre- and post-test surveys to all officers at or below the rank of sergeant. In the year between the two surveys, members of the SPI team presented information about ILP, CPD's Crime Analysis Unit (CAU), and SPI grant-related projects (i.e., the burglary project in North region and the gang network analysis) during the agency's monthly recertification training. Post-test survey results indicated that familiarity with ILP increased slightly during the grant period. This is an encouraging finding because it indicates there was some degree of organizational change within the agency. Furthermore, a greater percentage of officers indicated on the post-test that they were aware CPD had a CAU—another indication of change. At the same time, there was a strong feeling among officers that not enough useful intelligence was being provided by CPD's CAU during both surveys. This is particularly problematic because the CAU must be a key player in the department's operations in order for ILP to be fully implemented.

In the end, generating organizational change by way of moving the agency toward an intelligence-led mentality proved a tremendous task in light of the challenges presented by turnover at all levels of the agency. The chief who was in place during the formulation of the SPI grant proposal resigned four months after the project began. CPD then had an interim chief for nearly one year before Chief W. H. "Skip" Holbrook was appointed on April 11, 2014. He immediately formulated goals for the agency—one of which revolves around the development of the CAU and its capabilities. CPD finally has stability at the command staff level which will be crucial moving forward. Chief Holbrook was intrigued by the results of the gang social network analysis and will hopefully continue to build off of the projects that the SPI team conducted in an

effort to implement ILP into CPD's everyday practices. The grant projects have laid the

foundation for the continued integration and sustainability of ILP within the agency.

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List of Abbreviations

CAU .... Crime analysis unit

COP .... Community-oriented policing

CPD .... Columbia Police Department

FBR .... Field-based reporting system

FICs .... Field interview cards

IDEA .... Integrated Data Exchange and Analysis

ILP .... Intelligence-led policing

MDT .... Mobile data terminals

NIM .... British National Intelligence Model

POP .... Problem-oriented policing

RMS .... Records management system

SARA .... Scanning, Analysis, Response, and Assessment

SNA .... Social network analysis

SPI .... Smart policing initiative

STCG .... Strategic Tasking and Coordination Groups

TCG .... Tasking and Coordination Groups

TTCG .... Tactical Tasking and Coordination Groups

USC .... University of South Carolina

CHAPTER 1

TARGETED PROBLEM AND PROJECT OVERVIEW

Project Background

In Columbia, SC, in 2009, the violent crime rate was 86 percent higher than the national average and 48 percent higher for property crimes (UCR Group II cities data). In 2010, 1,306 violent crimes (1,010.2 crimes per 100,000 residents) and 7,898 property crimes were committed (6,109.6 crimes per 100,000 residents). At the time of writing the initial proposal for the Smart Policing Initiative (SPI) grant in 2011, the Columbia Police Department (CPD) was authorized for 384 officers. However, budgetary and other factors caused staffing to remain at 356 sworn officers (or below) while calls for service had increased each year (CPD officers responded to 167,912 emergency calls for service in 2010 alone). CPD's operating budget had increased only 0.61% from FY 2010 to FY 2011. In short, CPD was typical of many agencies throughout the United States—they were increasingly facing the responsibility of "doing more with less."

In the 10 years prior to the SPI grant, CPD had been proactive in adopting data-driven approaches to guide department operations by using such approaches as problem-oriented policing and COMPSTAT. The agency implemented a Field-Based Reporting System (FBR) that is linked to an automated Records Management System (RMS). Using Mobile Data Terminals (MDTs), officers access the FBR to input information for incident reports, arrest reports, custody reports, supplemental information reports, investigative reports, and field interview cards (FICs) into the RMS. The Department had also developed other data collection resources (e.g., vehicle collision reports, traffic citations, criminal intelligence, civil process, and criminal warrants) as well as databases that monitor narcotics investigations and pawn shop transactions. CPD Crime

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Analysis Unit (CAU) was producing various intelligence products from the data stored in the RMS (e.g., reports, maps, briefings, and presentations) regarding crime patterns, which it shared with command staff during COMPSTAT meetings.

However, the RMS system could not retrieve or correlate information from disparate databases. In addition, because of budget constraints, CPD had been able to offer only minimal training on the proper use of available data sources and report writing. Essentially, CPD was lacking the processes, tools, and training to fully integrate the data-driven efforts of the CAU into the day-to-day strategic- and tactical-level decisions by department personnel. Realizing it must increase its efficiency in the face of increasing crime and virtually static budgets, CPD began looking at ways to better use and integrate crime data and other information it had. The goal was to become a comprehensive intelligence-led agency.

Initial Intelligence-Led Plan

The Assistant Chief of CPD at the time approached the lead member of the University of South Carolina (USC) research team (Dr. Jeff Rojek) to seek a partnership in developing an initiative to achieve the goal of becoming an intelligence-led agency. Of particular interest to the Assistant Chief was making sure improvements in crime and intelligence analysis would have an impact on the day-to-day operations of the department. The proposed solution was to implement a version of the British National Intelligence model (NIM) which CPD referred to as the Integrated Data Exchange and Analysis (IDEA) project. The IDEA project became the focus of the SPI proposal which was jointly developed by the USC research team and CPD.

The NIM. The NIM emerged from circumstances similar to those confronting CPD—the need to do more with the same limited resources. A new orientation had emerged within the

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British government which demanded greater efficiency and effectiveness from law enforcement agencies without increasing their resources (Ratcliffe, 2008; Carter & Carter, 2009a). British government reports argued that the key to improving law enforcement operations was to establish intelligence analysis as a central component within the organizations (Audit Commission, 1993; Her Majesty's Inspectorate of Constabulary, 1997). This push for ILP culminated in the establishment of the NIM.

The NIM is a comprehensive framework that articulates the structure, process, resources, and analytic efforts needed to implement an intelligence-led policing (ILP) philosophy in every British police department (National Centre for Policing Excellence, 2005). The framework calls for the institutionalization of data collection and analysis into everyday policing practices. The goal of this effort is to produce timely intelligence on criminal activity that can be used to guide personnel on tactical operations and aid agency leaders in strategic decision making. The NIM focuses on a "tasking and coordination" process that separates agencies into mutually dependent strategic and tactical spheres which are linked by the intelligence products produced (and further described below). The purpose of the new ILP paradigm is to manage risk and rationalize the use of scarce resources.

The core of NIM consists of a platform that incorporates departmental personnel, equipment, and data into a process that moves from data collection to analysis to decision-making to action (National Centre for Policing Excellence, 2005). This process contains seven key components that unfold in a sequential manner:

1. Information Sources—the raw data that an agency gathers on a routine and direct basis, such as crime reports, field interviews, informant statements, and citizen tips.

2. Intelligence Recording—the processing of gathered data in a uniform manner into IT systems that allow for efficient retrieval for analytical purposes.

3. Research and Development—the primary analytical component of the process, which involves agency analysts utilizing the above information sources, along with information from other evidence-driven publications, to produce intelligence products.

4. Intelligence Products—the outcome of analyses intended to inform strategic and tactical planning and action. Products can include analysis of crime trends (i.e., strategic assessments), problem or tactical assessments (i.e., hot spots or gang violence), or offender and victim profiles.

5. Strategic and Tactical Tasking and Coordination Groups —the primary decision hub for integrating knowledge produced by analysts. The strategic TCG focuses on the agency-wide review of issues confronting the community which includes the prioritization of issues to be addressed and the resulting allocation of resources needed for their resolution. The tactical TCG focuses on the development of response plans to the problems prioritized by the strategic TCG and incorporates the knowledge produced by intelligence products to determine the allocation of specific personnel and tactics for response. At both levels the response plans may include resources from outside the department including other criminal justice and governmental agencies, businesses, and community organizations.

6.   Tactical Resolution—the actions taken to carry out the tactical response plan of

prioritized problems. The personnel responsible for carrying out these efforts shift based

on the issue being addressed and may include partners from outside the agency.

7.   Operational Review—the feedback mechanism for evaluation of the tactical response.

This effort includes impact and process evaluations carried out by personnel involved in

the response. This step also allows the agency to determine if continued or additional

action is required.

Perhaps the most important element of this process is the connection between the

intelligence produced by analysts and the actions of other agency units and partners. The goal of

the process is to avoid an outcome where intelligence produced either does not reach the

personnel who are responding to a problem or is ignored when planning actions. The strategic

and tactical TCGs are the primary means for bridging this gap. Among the key members of the

TCGs are department leaders and managers who have the authority to allocate personnel and

resources to address issues identified in the intelligence products. This includes the authority to

direct personnel to incorporate into their response plans the analysis provided by the intelligence

products. In sum, the leadership in the TCGs serves as an accountability mechanism for

connecting intelligence analysis with department actions.

CPD IDEA. The goal of IDEA was to institutionalize NIM components into CPD in an

effort to create a department-wide, data-driven process that would be sustainable beyond the life

of the requested funding. To implement IDEA, directives outlining protocols, procedures, and

responsibilities associated with the new evidence-based model were intended to be established.

CPD personnel would be trained on the intelligence model concept and the importance of collecting quality data, such as including more accurate addresses and information on incident reports for the purpose of crime mapping. IDEA would also bolster CPD's current information sources and include external sources of information (e.g., city business license information, municipal court databases, parking violations, local jail records, census and utility data, and/or comparative crime data from other jurisdictions) in strategic-level analysis. Software was to be purchased to connect CPD's disparate databases and the external data sources to allow for a single query interface capable of simultaneous searching. Additionally, a secure website would be created to provide real-time information that could be accessed via officers' MDTs.

The CAU would work with the USC research partners to develop intelligence products (such as crime trends, offender/victim profiles, or problem assessments—such as criminal hot spots) and response options that involve linking crime analysis to evidence-based policing practices. The CAU would evaluate the impact of the preventive and enforcement efforts by examining crime reports, calls for service, and CPD/community observations. The CAU would also conduct frequent operational reviews of the IDEA project. To shift to a crime *and intelligence* analysis function and enable the CAU to handle the increase in strategic and tactical analysis efforts associated with the implementation of the IDEA Project, CPD also received budgetary approval to hire a second crime intelligence analyst.

The implementation process would also include the creation of a permanent Strategic Tasking and Coordination Group (STCG) and a permanent Tactical Tasking and Coordination Group (TTCG). These groups would ensure that the intelligence products would reach personnel responsible for the planning and response to problems. Leadership personnel in these groups

were intended to serve as the accountability mechanism for connecting data-driven efforts with department actions.

The STCG was to be composed of the Assistant Chief of Police, the Deputy Chiefs of Administration and Operations, and the Crime and Intelligence Analysts. Additional staff would be asked to join STCG meetings occasionally to aid in specific decision-making efforts. Because some members already met on a monthly basis for a pre-COMPSTAT meeting, the STCG meeting would be folded into this monthly meeting. The STCG would review strategic intelligence products, make decisions regarding the allocation of resources in relation to these assessments, prioritize community problems, assign specific problems to the TTCG, and receive updates regarding ongoing tactical resolutions developed by the TTCG.

The TTCG would be composed of permanent and ad hoc members. The permanent members were to include the Deputy Chief of Operations, the Captain overseeing the Criminal Investigations Division, the Captain overseeing the Special Operations Division, and the Crime and Intelligence Analysts. The ad hoc members would include supervisory personnel from various patrol, investigative, and specialized units that have been given responsibility for the tactical resolutions to specific problems. The TTCG would meet on a biweekly basis and could include non-CPD members who would be valuable partners in carrying out tactical resolutions (e.g., other criminal justice agencies, other government agencies, or business/community organizations). The TTCG could request the CAU to conduct specific assessments of problems prioritized by the STCG. The TTCG would be responsible for developing response plans to the tasked problems based on the assessments, identify the personnel and departmental units responsible for carrying out the tactical resolution of the plan (e.g., preventive and enforcement

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efforts), and monitor other ongoing tactical resolutions. The TTCG would also examine operational review assessments of tactical resolutions and decide whether additional actions are needed.

The USC research partners were intended to play an active role in the implementation of the IDEA Project by helping develop new analysis strategies, products, and operational reviews. The research partners would assist with the creation and delivery of training on the IDEA Project to CPD staff, enhance data collection efforts by officers, and carry out evaluations of the implementation process and project outcomes. Additionally, the research partners would be responsible for collecting data to document the performance measures of the IDEA Project.

Adjusted Intelligence-Led Plan

Upon being awarded the SPI grant the initial intelligence-led plan was met with critical challenges. The awarding of the subcontract to the USC research partners took approximately 6 months after the grant was awarded to clear approval from the City of Columbia and Bureau of Justice Assistance (BJA; this was adjusted for by asking for an extension on the back end of the grant period). However, a number of key leadership changes occurred prior to, during, and shortly after this subcontract approval period which ultimately lead to a shift away from the initial intelligence-led plan. The Deputy Chief of Administration, who was identified as a key figure in the initial proposal plan, had left the department a few months prior to the grant being awarded. The position went unfilled for an extended period and the Assistant Chief and the Deputy Chief of Operations took over the administrative responsibilities for this position. However, by the time the subcontract with the USC research partners was in the final stages of approval in January 2013, the Deputy Chief of Operations had been detailed to the Federal

Bureau of Investigation's National Academy until March. Further, during the subcontracting period the Assistant Chief was advised that he could not be involved in the subcontract decision-making process on guidance from BJA (he had taught as an adjunct instructor at USC and there was concern regarding a conflict of interest). Consequently, the Chief decided that the Assistant Chief should not be directly involved with the project after the subcontract was awarded.

As a result of these personnel changes, the key leadership figures who were intended to develop a detailed plan for implementation, play key roles as members of the STCG, and provide leadership in moving the department toward adopting this new intelligence-led philosophy were no longer involved in the project (or at least not in the early formation in the case of the Deputy Chief of Operations). A notable loss was the removal of the Assistant Chief (Leslie Wiser) since he was the primary champion of the project and the lead department figure in the drafting of the proposal. In response, the Chief (Randy Scott) had become the lead figure of the project. However, there was little grant-related activity until the subcontract was near completion and the research partners and crime analysts were able to begin coordinating meetings to start project implementation.

The initial meeting for the project involved the department crime and intelligence analysts, three management-level personnel from the department, and the USC research team. Unfortunately, the department management personnel tasked to this meeting were unaware of the SPI grant and were under the impression that the meeting was about *pursuing* a grant (as opposed to working on one that had been awarded to the department). The research team provided a review of the SPI and the proposal that was submitted. Given that this was the first time these management personnel had heard mention of the grant, the decision was made to

schedule a meeting in a couple weeks to discuss how to move forward. At the second meeting, the group came to the conclusion that moving forward at this point with the full model of organizational change proposed under the IDEA project would be problematic given the current absence from the working group of the Assistant Chief and Deputy Chief of Operations. The research team raised two potential solutions: (1) wait until the Deputy Chief returns from the National Academy and then establish routine working group meetings to design the implementation of the full proposed model, or (2) develop a pilot project that resembled elements of the proposal and reflected a data-driven operational exercise that was not concerned with implementation of the model across the entire agency. The idea was to work through the data-driven process on a small scale and transition to an actionable operation which could serve as a model when moving toward full implementation of ILP within CPD.

The Chief expressed interest in moving forward despite a nearly non-existent STCG. This resulted in the adoption of the pilot approach and, therefore, the first adjustment in the plan outlined in the proposal. At this point—and to get things moving with the grant—the research partners suggested that the working group should begin by analyzing departmental crime and arrest data to identify areas within the city with concentrated crime problems. The idea was to use a problem-oriented policing (POP) approach in order to begin developing a program to reduce crime and disorder within a defined geographic area. Importantly, this approach was advocated for because it would allow CPD to select specific geographic areas to target in an evidence-based fashion as opposed to relying solely on assumptions and anecdotes about problematic areas. This exercise was as much about working through the data-driven process as a group as it was about selecting target areas. The USC research team worked with the department

crime and intelligence analysts in conducting these analyses, which resulted in the identification of four areas of concentrated crime. USC and the analysts then presented the results of the analyses to the other members of the working group and the Chief. The presentation and related discussion resulted in the identification of the Hyatt Neighborhood as the area for the grant's first operational project. In addition to the analyses presented, the neighborhood was selected because of the persistence of numerous problems in the area and the Captain of the region (who became the Deputy Chief within the year) containing Hyatt was interested in taking a new proactive approach.

Upon selection of the Hyatt Neighborhood, the USC research partners presented the idea of conducting a community survey in the Hyatt Neighborhood, which had two intended purposes. First, the Hyatt Neighborhood had a number of crime and disorder issues that could be the focus of a targeted intervention and the survey would provide the opportunity to receive citizen feedback regarding their perceptions of the most important issues in the community. Accordingly, the survey was developed to capture such sentiments by including questions on self-reported victimization and perceived crime and disorder problems in the neighborhood. Second, the department had little background in conducting systematic surveys of community members. The survey served as a mechanism for community outreach and an avenue for other feedback. For example, in addition to capturing responses on victimization and perceived community problems, the survey incorporated questions related police legitimacy and procedural justice to provide insight on how community members perceived the agency and its officers. In sum, and consistent with a POP approach, the survey provided an additional layer of problem identification and community outreach.

Unfortunately, shortly after this meeting the Chief left the agency on an unexpected leave, and then three weeks later resigned due to stress and related issues. Soon after, the working group lost representation from the initial management personnel. When combined with the sudden departure of the Chief, the dissipation of the working group caused a setback in the implementation of a pilot ILP project. However, the USC research team and members of the CAU moved forward with the community survey. The questionnaire was administered to a random sample of citizens in the Hyatt Neighborhood and three comparison neighborhoods. The survey captured perceptions of community crime and disorder problems, self-reported victimization and reporting to the police, contact with the police, perceptions of collective efficacy, and perceptions of police procedural justice and legitimacy. The results of this survey are discussed in more detail in a subsequent section of this report.

Survey data collection was completed during the summer of 2013 and the results were presented to the Interim Chief (former Deputy Chief of Operations, Ruben Santiago) soon thereafter. One of the primary benefits of the survey and subsequent presentation was that it focused the direction of the Hyatt Neighborhood pilot project. Burglary was rated by residents of Hyatt as the most serious problem in their community relative to other crime and disorder problems. Furthermore, Hyatt respondents had the highest levels of self-reported burglary victimization relative to the three comparison neighborhoods. These findings squared well with the official data regarding crimes reported to the department. Based on these findings, the USC research team and members of the CAU recommended to the Interim Chief that the Hyatt project should focus on reducing burglaries, and the Interim Chief agreed with this focus.

The USC research partners drew on the emerging criminological literature on repeat and near-repeat burglaries to frame an understanding of the burglary project in the Hyatt Neighborhood and to identify potential response solutions. Members of the CAU and USC research team began working with the Captain of the North Region (Melron Kelly)—which encompasses the Hyatt Neighborhood—and his staff in late August 2013 to further analyze the burglary problem and formulate a response approach. The pilot project again faced some delays due to personnel changes: the Captain of the North Region was promoted in fall 2013 to Major and the lead crime and intelligence analyst resigned from the department in February 2014. Nonetheless, Major Kelly continued to be a supporter of the Hyatt project and the new leadership of the North Region continued to be committed to the burglary project, which was officially implemented in the spring of 2014. More detailed discussion of the repeat and near-repeat burglary project in the Hyatt Neighborhood is presented in a later section of this report.

As the Hyatt burglary project began moving toward implementation, the remaining crime and intelligence analyst and the USC research team started to explore other potential projects that could incorporate an intelligence-led approach. There were still vacancies in leadership positions in the department and the CAU (and the Chief was on interim status). As a result, a move back to the original focus on a more holistic organizational shift to ILP outlined in the original proposal still appeared to lack foundation. A second ILP-focused project appeared to be the more pragmatic approach at this point, which the Interim Chief supported.

The focus of the second project was a social network analysis (SNA) of the city's gangs and gang members. Members of the USC research team had worked with the police department in the past on the city's gang problem and one of the key gaps was intelligence on gang members

and gang activity. The department's efforts in this area had improved since this early review. However, the gang unit had only three officers to accomplish intelligence-gathering tasks. The use of SNA to improve data validation, intelligence analysis, and focus response efforts was proposed by the USC research partners as the second evidenced-based project. In the early development of this project the Interim Chief left the department and was replaced by Chief Holbrook (this transition is discussed in more detail later). The Chief was immediately supportive of both projects and the overall SPI grant. As such, the crime and intelligence analyst, related department personnel, and USC research team continued forward with these efforts. More detail on the SNA of Columbia gangs is provided in a later section of this report.

In addition to the pilot projects, the SPI initiative incorporated training of department personnel. The initial training plan in the proposal was to support the IDEA initiative, where every member of the department would receive guidance on the concepts, practices, and policies of this effort. With the movement away from large-scale organizational change, a more focused training regimen that presented the concepts of the ILP, introduced the SPI grant, and explored the capabilities of the CAU was developed for all department personnel. Prior to the SPI grant department personnel had limited exposure to these issues. In addition, there were also more focused training efforts directed at building the skills and capacity of the CAU. The initial proposal called for surveying officers before they received this training and at the conclusion of the SPI grant period to capture receptivity to the IDEA initiative and their engagement in related efforts. As such, the USC research team incorporated pre- and post-test surveys of department personnel to assess this training. These training efforts and related survey results are discussed in more detail later.

In sum, the changes in department leadership and other key department personnel over the grant period created a pragmatic need to adjust the initial project plan. Each of the individuals who were in leadership positions during the grant period were supportive of the department moving toward an intelligence-led approach and the overall SPI grant. As a result, the pilot projects, along with the related analysis and research efforts, became a way to move forward with an intelligence-led approach to set a foundation for later establishment of the IDEA plan once personnel changes stabilized. The new Chief is committed to these efforts which will allow the continued growth of the department's intelligence-led practices beyond the life of the SPI grant period. The remainder of this report provides a more detailed review of the above projects and related efforts. We conclude with a discussion of the department's ILP path ahead.

CHAPTER 2

ANALYSIS AND EVALUATION OF GRANT OUTCOMES

The following sections will explore the various projects, analytic steps, and evaluations that corresponded with the SPI grant. With respect to the specific projects and initiatives that took place, separate sections will be devoted to the (1) community outreach survey and initial problem identification, (2) the repeat and near-repeat burglary intervention project, and (3) the examination of Columbia's gang problem using social network analysis. Next, we will provide an overall program evaluation of the SPI grant that will include (1) an examination of CPD officer awareness of intelligence-led policing and related components and (2) a process evaluation that discusses the technical organizational changes that occurred during the grant, turnover challenges faced during the grant period, and the integration and sustainability of grant activities moving forward. The report will conclude with a summary of the primary outcome and evaluation findings and lessons learned during the grant.

SECTION 1:

Community Outreach Survey and Initial Problem Identification

In the beginning phases of the SPI grant and based on suggestions offered by the USC research partners, command staff at CPD expressed interest in conducting surveys of Columbia residents to gauge their perceptions of community problems. The purpose of such a survey is rooted in community-oriented policing (COP) and POP philosophies that emphasize the importance of communicating with citizens to effectively address crime or disorder problems (Braga, 2014; Reisig, 2010; Skogan & Hartnett, 1997). Ultimately, the goal was to move beyond the official data collected by CPD and its own officers' understanding of the city's crime

problems by determining what issues were most important to the community. The data gleaned

from the survey could be leveraged to help intelligently identify problems that the agency should

target through the SPI initiative. It is also important to note that CPD's willingness to engage in

community outreach in an effort to gather diverse information to guide evidence-based policing

decisions was an early indication of organizational change in action (i.e., this was an early

indication of the agency's desire to move toward ILP). Consistent with the SARA model from

the POP framework, the survey allowed CPD to harness a "smart" method of scanning and

identifying problems to target with evidence-based strategies. Allowing community participation

and voice demonstrated a commitment to improving crime, disorder, and quality-of-life concerns

within Columbia.

Methodology

As discussed earlier, a Strategic Tasking and Coordination Group (STCG) was

established in the early phases of the SPI grant and consisted of members from CPD's command

staff and CAU and the USC research partners (i.e., Drs. Jeff Rojek, Robert Kaminski, Scott

Wolfe, and Justin Nix). The purpose of the group was to provide an executive-level team that

could coordinate discussions centered on problem identification and response options and

delegate responsibility to appropriate units within the agency. Within the first meetings,

preliminary data analysis revealed that high levels of criminal activity (e.g., burglary and gang-

related offenses) were concentrated in several specific locations in Columbia. Top CPD

executives expressed the desire to target such issues with the SPI grant. The research partners

suggested the deployment of a community survey in several of the neighborhood crime hot spots

as a community outreach effort and method for identifying issues that may be hidden with

official data. As indicated above, the command staff supported this strategy.

Accordingly, the STCG worked to identify neighborhoods with significant crime

problems as demonstrated by official crime reports and calls for service data. Four

neighborhoods were selected to allow for manageability, cost-efficiency, and

comparability/evaluation. The USC research team and CAU worked together with the goal of

identifying three neighborhoods that closely resembled each other in terms of Part I crime rate

and economic disadvantage (e.g., median household income). From this list, one neighborhood

would be selected to receive some form of law enforcement intervention based on official data

analysis, survey results, and further scanning and analysis consistent with the SARA model. The

remaining two neighborhoods would serve as control locations. On average, these three

neighborhoods experienced 82.8 Part I crimes per 1,000 residents and had a median household

income of $27,700 in the year prior to the study. It is important to note that the neighborhoods

included in this study are situated in the largest patrol regions in the city, have relatively high

levels of disadvantage, property crime, and violent crime, and, therefore, are routinely exposed to

law enforcement presence. Finally, a fourth neighborhood was selected by the STCG to serve as

a contrast to the three economically disadvantaged and crime-ridden communities. This more

affluent neighborhood (median household income ~$51,000) experienced 45.5 Part I crimes per

1,000 residents in the year prior to the study.

Data. With the neighborhoods selected, a random sample of 1,000 households from each

location was selected to take part in the community survey (total $N = 4,000$). A modified Dillman

survey method was used to elicit participation in the survey. An initial round of surveys was

mailed to all households with a cover letter detailing the purpose of the study and importance of participation. Two weeks later a reminder post card was mailed to potential respondents to help encourage those whom had not responded to do so. Finally, two weeks after the post card reminder another full survey and cover letter was mailed to potential respondents. Respondents were also given the option to complete the survey on a secure website (Dillman et al., 2009). A total of 323 surveys were removed from the analysis because they arrived at vacant or otherwise inaccessible addresses. This methodology resulted in 1,681 returned surveys representing a 45.72% response rate (over 95% of respondents completed the mail version of the questionnaire). This is comparable with average response rates generated from other random sample mail surveys (Baruch, 1999).

Respondents ranged in age from 19 to 96 (mean = 57) and about two-thirds of the sample was female. With respect to race, 52% of respondents where White, 41% African American, and about 7% self-identified as some other racial group (i.e., Hispanic or Latino, Asian, multiple races, and "other"). A vast majority of respondents (96%) indicated that they had lived in their current residence for at least six months. Nearly half of the sample reported having at least a college degree. Compared to Census estimates, the sample includes a slightly larger proportion of females and older residents in the sample neighborhoods. However, the sample closely approximates the racial composition of the neighborhoods. Overall, the sample reasonably represents the population from which it was drawn.

The questionnaire. The self-report survey asked respondents questions regarding their perceptions of neighborhood crime, disorder, and social control problems, and their attitudes toward local law enforcement officers. The survey contained questions with a mixture of yes/no

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and Likert-type response categories (e.g., strongly disagree to strongly agree). Neither the hard-copy or web survey collected personal identifying information from the respondents. The web survey did not force respondents to answer any questions (i.e., they could skip questions). Appendix A provides the complete questionnaire.

Results

The first portion of the survey presented respondents with a list of potential neighborhood problems (ranging in seriousness from the presence of garbage/litter along streets to people being robbed) and asked them to report whether each was *not a problem at all*, *somewhat of a problem*, or a *serious problem* in their respective neighborhood. Table 1 provides the results from this section of the questionnaire. The findings suggest that respondents in this sample were most concerned with peoples' homes being burglarized. Roughly two out of every three respondents felt that residential burglary was somewhat of a problem or a serious problem in their neighborhood. After burglary, the next two most prevalent issues in respondents' neighborhoods were traffic problems (54%) and the presence of garbage/litter on or along the streets (46%). Almost 40% of respondents believed that gunshots were a problem in their neighborhood. Finally, 24% of respondents felt that the presence of youth gangs was a problem in their communities.

Table 1. Columbia residents' perceptions of crime and disorder

Problem:	Not a problem	Somewhat of a problem	Serious problem
Garbage/litter	54%	36%	10%
Excessive noise	62%	28%	10%
Vandalism	72%	22%	6%
Drunk drivers	74%	21%	5%
Traffic problems	46%	39%	15%
People drinking in public	79%	15%	6%
People using/selling drugs	68%	20%	12%
Groups of teens or others loitering	68%	23%	9%
Presence of youth gangs	76%	17%	7%
Prostitution	87%	10%	3%
People fighting in public	88%	9%	2%
People arguing in public	80%	16%	4%
Homes being burglarized	36%	44%	20%
People being robbed	77%	18%	5%
Gunshots	62%	26%	12%

Respondents were also presented with three statements pertaining to their fear of crime and asked whether they *strongly disagreed, disagreed, agreed*, or *strongly agreed* with each item. Table 2 presents the percentage of respondents in the sample that either *strongly disagreed/disagreed* or *strongly agreed/agreed* with each statement. Over half of the respondents reported that they were fearful of walking alone at night in their neighborhood (54%). A smaller number of respondents reported that they do not feel safe and secure in their homes (17%) or were prevented from doing something they would have liked in the past month (27%). These results, although not trivial, are consistent with the average levels of fear of crime found in other samples across the United States and internationally (see e.g., Farrall & Gadd, 2004).

Table 2. Columbia residents' fear of crime

Survey item:	Strongly disagree/ Disagree	Strongly agree/ Agree
I generally do not feel safe walking alone at night in my neighborhood.	46%	54%
I generally do not feel safe and secure in my home.	83%	17%
In the past month, fear of crime has prevented me from doing things I would have liked to do.	73%	27%

Note: The first two items are reverse coded from the original wording on the questionnaire to reflect greater fear of crime with strongly agree or agree responses (i.e., "do not feel safe").

The next portion of the survey asked respondents to indicate the number of times in the previous six months they had been the victim of different crimes. Table 3 displays the percentage of respondents who reported being a victim at least once during the six months prior to the survey for each crime. Respondents most frequently reported being the victim of property-related offenses: 10% said their property had been vandalized, 9% said their vehicle had been broken into, and 8% said that their home had been burglarized. About 2% or less of the sample reported having been the victim of an auto theft, assault with or without a weapon, or robbery.

Table 3. Columbia residents' self-reported victimization in previous 6 months

Crime:	% Victimized one or more times
Auto theft	1%
Auto break-in	9%
Vandalism	10%
Burglary	8%
Assault	1%
Assault with a weapon	2%
Robbery	2%

Finally, respondents were asked to indicate whether they *strongly disagreed, disagreed, agreed*, or *strongly agreed* with a series of eleven statements that pertained to their evaluations of CPD. Specifically, the statements dealt with perceived fairness of police officers, perceived legitimacy of CPD, and overall satisfaction with the police. Table 4 reveals the percentage of respondents who either *strongly disagreed/disagreed* or *strongly agreed/agreed* with each statement. The majority of respondents believe that CPD officers treat citizens fairly. For example, 93% of the sample indicated that officers treat citizens with respect. Similarly, 90% of respondents felt that officers take the time to listen to people. A much smaller portion of the sample thought that officers treat citizens differently based on race or wealth—17% and 21%, respectively. When broken down by race (not reported in Table 4), about 9% of white respondents felt that the police treat citizens differently based on race, whereas about 29% of minority respondents felt this way. While important, this is not surprising because a common finding in policing research is that minority citizens feel officers treat them differently than white citizens (Henderson et al., 1997; Hurwitz & Peffley, 2005; Reitzel & Piquero, 2006; Schuck & Rosenbaum, 2005; Tyler & Wakslak, 2004; Weitzer & Tuch, 1999; Weitzer & Tuch, 2004).

In terms of the perceived legitimacy of CPD, roughly three-quarters of respondents agreed that citizens should obey police commands even if they disagree. Similarly, 79% of respondents felt that CPD could be trusted to make decisions that are right for the community. Finally, with respect to satisfaction, 84% of respondents felt that CPD was doing a good job in their neighborhood and 56% agreed that there were enough police in their neighborhood.

Table 4. Columbia citizens' perceptions of CPD

Survey item:	Strongly disagree/ Disagree	Strongly agree/ Agree
Police treat citizens with respect.	7%	93%
Police take time to listen to people.	10%	90%
Police treat people fairly.	8%	92%
Police explain their decisions to the people with whom they deal.	13%	87%
Police give minorities less help because of their race.	83%	17%
Police provide better services to wealthy citizens.	79%	21%
You should accept police decisions even if you think they are wrong.	64%	36%
You should do what the police tell you even if you disagree.	27%	73%
The police can be trusted to make decisions that are right for the community.	21%	79%
The police are doing a good job in my neighborhood.	16%	84%
There are enough police in my neighborhood.	44%	56%

Summary

In sum, Columbia residents appeared to have significant concerns with residential burglary in their communities. Further, the presence of youth gangs and activities typically associated with gangs (e.g., drug sales, gunshots, and loitering groups) emerged as problematic in the eyes of the respondents. Although victimization was relatively rare as would be expected, a sizable portion of the sample reported being the victim of serious crimes such as burglary. Finally, in general, respondents had favorable views of CPD but there was important variation in such attitudes across the sample.[1]

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[1] Several academic journal articles have also resulted from additional analyses of the community survey data. The first manuscript was published in *Crime and Delinquency* (Nix, Wolfe, Rojek, & Kaminski, 2015) and demonstrates that citizens' procedural justice evaluations are a primary source of trust in the police and that perceived collective

Implications

The implications of the community survey are two-fold. First, allowing Columbia residents to voice concerns about problems in their neighborhoods permitted CPD to engage in a simple yet effective community-oriented policing tactic. In short, the survey provided the message to residents that the agency honestly cares about their opinions and concerns. To leverage this outreach, the USC research partners and CPD distributed a press release concerning the community survey and results (see Appendix B). This resulted in media coverage with a story run by the Daily Gamecock (http://www.dailygamecock.com/article/2013/06/in-our-opinion-columbia-police-usc-join-forces-for-good).

Second, and most importantly for the purposes of the grant, the information gleaned from the survey served as a detailed analytic step in the overall POP strategy that was being adopted by CPD as part of the SPI. The research partners analyzed the survey data and presented the results to Interim Chief Ruben Santiago at an executive-level meeting.[2] Consistent with Goldstein's (1979; see also Braga, 2014) recommendations regarding POP, the survey data was used as an additional layer of analysis in the identification of priority issues for the agency (i.e., the "Analysis" phase of the SARA model). In combination with additional, advanced analytic efforts (see burglary and gang social network statistical analyses discussed below) and command staff meetings, this led to the development of tactical operational interventions aimed at addressing the issues of residential burglary and gang violence. While multiple problems could

efficacy is associated with trust after accounting for procedural justice (http://cad.sagepub.com/content/61/4/610). The second article is forthcoming in the *Journal of Quantitative Criminology* (Wolfe, Nix, Kaminski, & Rojek, 2015) and reveals that procedural justice has a largely invariant effect on measures of police legitimacy.
[2] Ruben Santiago assumed Interim Chief duties at CPD after the resignation of Chief Randy Scott who was the Chief during the beginning phases of the SPI. Santiago was later replaced when William "Skip" Holbrook was hired as the permanent Chief of Police for CPD.

have been targeted by CPD, these two issues were selected for several reasons. First, anecdotal evidence within the agency based on prior experiences and community meetings identified residential burglary as a persistent problem within Columbia for many years. Additionally, research and analysis conducted by the research partners concerning possible burglary interventions was presented to command staff at the STCG meetings. This information allowed CPD command staff the opportunity to visualize actionable strategies to combat burglary which is a crime that has traditionally been viewed as difficult for law enforcement to control. Finally, gang violence in the Columbia area had been a law enforcement and public concern for a number of years leading up to the community survey. Lack of resources—staffing shortages and rudimentary gang intelligence and data collection abilities—had long plagued the agency and its capacity for smartly intervening in the gang problem. This was coupled with a highly publicized tragedy where a USC college student was paralyzed by a stray bullet fired from a known gang member while she was waiting for a cab in an entertainment district in Columbia (near USC's campus). This event occurred shortly after the administration of the community survey and created significant public and political pressure on CPD to "do something" about the gang problem. In short, the conditions were appropriate for CPD to leverage the SPI grant and ILP to delve deeper into the gang problem. In the next section, we turn to the first project that originated from the POP strategies discussed above—the Columbia Repeat and Near-Repeat Burglary Intervention Project.

SECTION 2:

The Columbia Repeat and Near-Repeat Burglary Intervention Project

This section will present the results of the repeat and near-repeat burglary intervention project. As discussed earlier (see pp. 10-13 and Chapter 2, section 1 of this report), burglary was identified as a key problem within Columbia using both official CPD data and citizen surveys. Additionally, anecdotal officer accounts verified that residential burglary has been a reoccurring problem within the jurisdiction for many years. Following the identification of the neighborhood to receive a targeted burglary intervention—Hyatt Park—the USC research partners conducted more nuanced analyses of the issue. A review of the policing literature demonstrated that repeat and near-repeat burglaries are a common phenomenon. Additionally, the literature identified strategies that have successfully impacted such residential burglary issues. As part of a POP strategy, our additional analyses of the burglary problem in Hyatt Park (and North Region more generally) focused on whether a similar pattern existed in this area. The following section describes these additional analyses.

Analysis of North Region and Hyatt Park Study-Area Residential Burglaries and Attempted Burglaries, January 1, 2012 – October 31, 2014

This section presents an analysis of the temporal and spatial patterning of residential burglaries and attempts that occurred January 1, 2012 – October 31, 2014, including repeats and near-repeats, in CPD's North Region as well as the Hyatt Park study area. Basic descriptive statistics are presented, followed by analyses of temporal patterns of repeat burglaries that show the time periods of greatest risk for a second event. Next, mapping software is employed to

display burglary hot spots and to identify repeat-burglary locations in which residences were burglarized two or more times. Ratcliffe's (2009) Near-repeat Calculator is then used to test statistically whether or not an initial (or source) burglary significantly increases the risk of one or more subsequent burglaries at the same location ('repeats') as well as at nearby residential locations ('near-repeats'). The final analysis provides a statistical test of whether or not CPD's burglary reduction intervention project was associated with a significant reduction in the number of burglaries in the Hyatt Park study area. As part of this evaluation, we also include a control area that did not receive the intervention for comparative purposes.

Descriptive statistics

Geocoded residential burglary address locations (including attempts) were generated citywide by CPD's crime analysis unit. Of 2,990 incidents reported, 2,941 were successfully matched to an address producing a 98.4% hit rate. As indicated in Table 5, there were 1,056 and 222 burglaries or attempts in the North Region and Hyatt Park study area (hereafter *Hyatt*), respectively. In the North Region, 841 locations were burglarized an average of 1.26 times, while in Hyatt, 183 locations were burglarized an average of 1.21 times over the study period.

Table 5. Basic statistics for North Region and Hyatt study area burglaries, 1/1/12 – 10/31/14

	North Region	Hyatt Study Area
Total Burglaries*	1,056	222
Total Locations	841	183
Mean Number per Location	1.26	1.21

*Includes completed and attempted burglaries.

Table 6 presents descriptive statistics for burglaries geocoded to all address locations and separately for locations burglarized two or more times (repeats only) for the North Region (Panel A) and Hyatt (Panel B). The number of days, weeks, and months between first and second burglaries are also shown for each area.

In the North Region, 841 locations accounted for a total of 1,056 burglaries, while 135 repeat locations accounted for 350 burglaries (burglary counts not shown in table). Thus, repeat burglary locations accounted for 16.1% of all burglary *locations* (135/841), and repeat burglaries accounted for 33.1% of all *burglaries* in the North Region (350/1,056). The percentages for Hyatt are similar. Specifically, 183 locations accounted for 222 burglaries, while 31 repeat locations accounted for 70 burglaries. In Hyatt, therefore, repeat burglary locations accounted for 17.0% of all burglary *locations* (31/183) and repeat burglaries accounted for 31.5% of all *burglaries* (70/222).

The number of burglaries per location in the North Region overall ranged from 1 to 24 while in Hyatt the range was 1 to 3. The time interval between first and second burglaries was shorter in Hyatt than in the North Region. For example, in the North Region the average number of days between the first and second burglary was 238.6, whereas it was 182.1 days in Hyatt. Similar patterns are observed for weeks and months (Note that the extreme value of 24 burglaries is due to the use of a single address to report incidents that occurred at Latimer Manor Apartments, an apartment complex located at 100 Lorick Circle. Additional information regarding high repeat locations will be addressed later).

Table 6. Descriptive statistics for burglary locations, North Region and Hyatt Park, 12/01/12 – 10/30/14

Panel A. North Region

Statistic	All Burglary Locations	Repeat Burglary Locations	Days between 1st & 2nd burglary	Weeks between 1st & 2nd burglary	Months between 1st & 2nd burglary
Mean	1.26	2.59	238.55	34.17	7.49
Minimum	1	2	1	0	0
Maximum	24	24	894	145	33
Totals	841	135	135	135	135

Panel B. Hyatt Study Area

Statistic	All Burglary Locations	Repeat Burglary Locations	Days between 1st & 2nd burglary	Weeks between 1st & 2nd burglary	Months between 1st & 2nd burglary
Mean	1.21	2.26	182.10	25.55	5.58
Minimum	1	2	1	0	0
Maximum	3	3	696	99	22
Totals	183	31	31	31	31

Notes: Data include both completed and attempted burglaries; zero values include locations burglarized one or times within the specified time interval. In the North Region, 10 locations were burglarized more than once within a week and 24 within one month. In the Hyatt study area, four locations were burglarized more than once within a week and 12 within one month. No locations were burglarized more than once within a day.

Table 7 presents frequency distributions and other statistics for address locations burglarized one or more times (Panel A) and those burglarized two or more times (Panel B) in the North Region. Based on the data in Panel A, we see that 706 (83.9%) of addresses were burglarized once and 135 (16.1%) were burglarized more than once during the observation period. Table 3 also reveals that the 706 single burglary *locations* accounted for 66.9% of all *burglaries* (706/1056), while the 135 repeat locations accounted for 350 or 33.1% of all burglaries (350/1056). Thus, repeat burglaries accounted for a substantial proportion of all burglaries in the North Region.

Table 7. Frequency distributions for North Region locations burglarized one or more times and two or more times, 12/01/12 – 10/31/14

Panel A. North Region Locations Burglarized One or More Times						
# Times Address Burglarized	Number of Addresses	Percent of Addresses	Cumulative Percent of Addresses	Number of Burglaries	Percent of Burglaries	Cumulative Percent of Burglaries
1	706	83.9	83.9	706	66.9	66.9
2	96	11.4	95.4	192	18.2	85.1
3	27	3.2	98.6	81	7.7	92.8
4	6	0.7	99.3	24	2.3	95.1
5	4	0.5	99.8	20	1.9	97.0
9	1	0.1	99.9	9	0.6	97.6
24	1	0.1	100.0	24	2.3	100.0
Totals	841	100.0	---	1056	100.0	---

Panel B. North Region Locations Burglarized Two or More Times						
2	96	71.1	71.1	192	54.9	54.9
3	27	20.0	91.1	81	23.1	78.0
4	6	4.4	95.6	24	6.9	84.9
5	4	3.0	98.5	20	5.7	90.6
9	1	0.7	99.3	9	2.6	93.2
24	1	0.7	100.0	24	6.9	100.0
Totals	135	100.0	---	350	100.0	---

Notes: Data include both completed and attempted burglaries.

Examining repeats only (Panel B) we see that the majority of repeat locations were burglarized twice (96 or 71.1%) while 27 (20.0%) were burglarized 3 times. Only 12 or 8.9% of the repeat burglary locations were burglarized 4 or more times. Of the 350 repeat location burglaries, 192 (54.9%) involved 2 repeats only and another 81 or 23.1% involved 3 repeats; 77 (22.0%) involved 4 or more burglaries. The table also reveals several locations that account for high numbers of repeats. For example, 4 address locations were burglarized 5 times each and one was burglarized 9 times. These may be high-rise apartments or other multiple-unit locations for which officers report a single address and will be further explored later in the report.

Table 8 presents the results for Hyatt. As indicated in Panel A, 152 (83.1%) addresses were burglarized once during the observation period and 31 (16.9%) were burglarized two to three times. Table 8 also indicates that the 152 single burglary *locations* accounted for 68.5% of all *burglaries* (152/222), while the 31 repeat locations accounted for 31.5% of all burglaries (70/222). These figures largely mirror those of the North Region overall and indicate a substantial number of repeat burglary locations for both areas.

Examining repeats only (Panel B) we see that most locations were burglarized twice (23 or 74.2%) while another 8 (25.8%) were burglarized 3 times. Only 14 (11.2%) of the repeat burglary locations were burglarized 4 or more times. We also see that among the 70 repeat burglaries, 46 (65.7%) represented 2 repeats and another 24 (34.3%) represented 3 repeats.

Table 8. Frequency distributions for Hyatt Park locations burglarized one or more times and two or more times, 12/01/12 – 10/31/14

Panel A. Hyatt Area Locations Burglarized One or More Times

# Times Address Burglarized	Number of Addresses	Percent of Addresses	Cumulative Percent of Addresses	Number of Burglaries	Percent of Burglaries	Cumulative Percent of Burglaries
1	152	83.1	83.1	152	68.5	68.5
2	23	12.6	95.6	46	20.7	79.3
3	8	4.4	100.0	24	10.8	100.0
Totals	183	100.0	---	222	100.0	---

Panel B. Hyatt Area Locations Burglarized Two or More Times

# Times Address Burglarized	Number of Addresses	Percent of Addresses	Cumulative Percent of Addresses	Number of Burglaries	Percent of Burglaries	Cumulative Percent of Burglaries
2	23	74.2	74.2	46	65.7	65.7
3	8	25.8	100.0	24	34.3	100.0
Totals	31	100.0	---	70	100.0	---

Notes: Data include both completed and attempted burglaries.

In summary, in both the North Region and Hyatt between 16 and 17 percent of burglarized residential locations were repeat locations (i.e., they were burglarized two or more times), which is a substantial percentage. Further, of all the burglaries that occurred in each area, approximately one-third consisted of repeats. Thus, regardless of whether overall burglary rates are considered high, low or moderate, repeat burglaries appear to present a significant issue for the Hyatt study area and the North Region overall. Other analyses found that on average the time between first and second burglaries in Hyatt was shorter than in the North Region generally. A more detailed examination of the timing of repeat burglary events is examined next.

Temporal patterns - Time between 1st and 2nd burglaries

Further insight into the temporal patterns of repeat residential burglaries can be gleaned by examination of the amount of time that elapsed between initial or source burglaries and

subsequent ones at the same locations (i.e., repeats). Figures 1 and 2 below present this graphically for the North Region for the number of weeks and months between repeats, respectively. Figures 3 and 4 present the same information for the Hyatt Park study area. Zero values represent repeats that occurred in less than one week and less than one month. Cumulative proportions also are presented to indicate the percentage of repeats that occurred within a certain number of weeks or months.

As shown in Figure 1, 10 repeats occurred in less than a week (corresponding to the zero value on the horizontal axis), another 5 occurred within the first full week, 4 during the second week, 5 during the third week, and so forth. The graph reveals that there is a high risk of a repeat during the few days after a source burglary (10 in less than a week). The cumulative proportions show that the risk declines rapidly thereafter, but remains relatively high through the 13th week, at which point 40% of all repeats occurred. Regarding months, Figure 2 displays a similar pattern in that the period of highest risk is less than one month (24 or 18% of all repeats). Nearly 30% (49) occurred within two months or less, and just over half (50.4%) occurred within 5 months or less.

The patterns for Hyatt tell a similar story, except that repeats tended to occur within a shorter time frame than those in the North Region overall. As shown in Figure 3, while there is greater fluctuation in the counts (because we are dealing with small numbers of repeats in any given week), we see that 45% of all repeats occurred by the 4th week versus 20% for the North Region. Regarding months, Figure 4 reveals that 45% of all repeats occurred within a month or less in Hyatt versus 29% for the North Region.

Figure 1. Weeks between 1st and 2nd North Region burglaries, 1/1/12 - 10/31/14

Note: Zeros represent second burglaries that occurred in less than one week

35
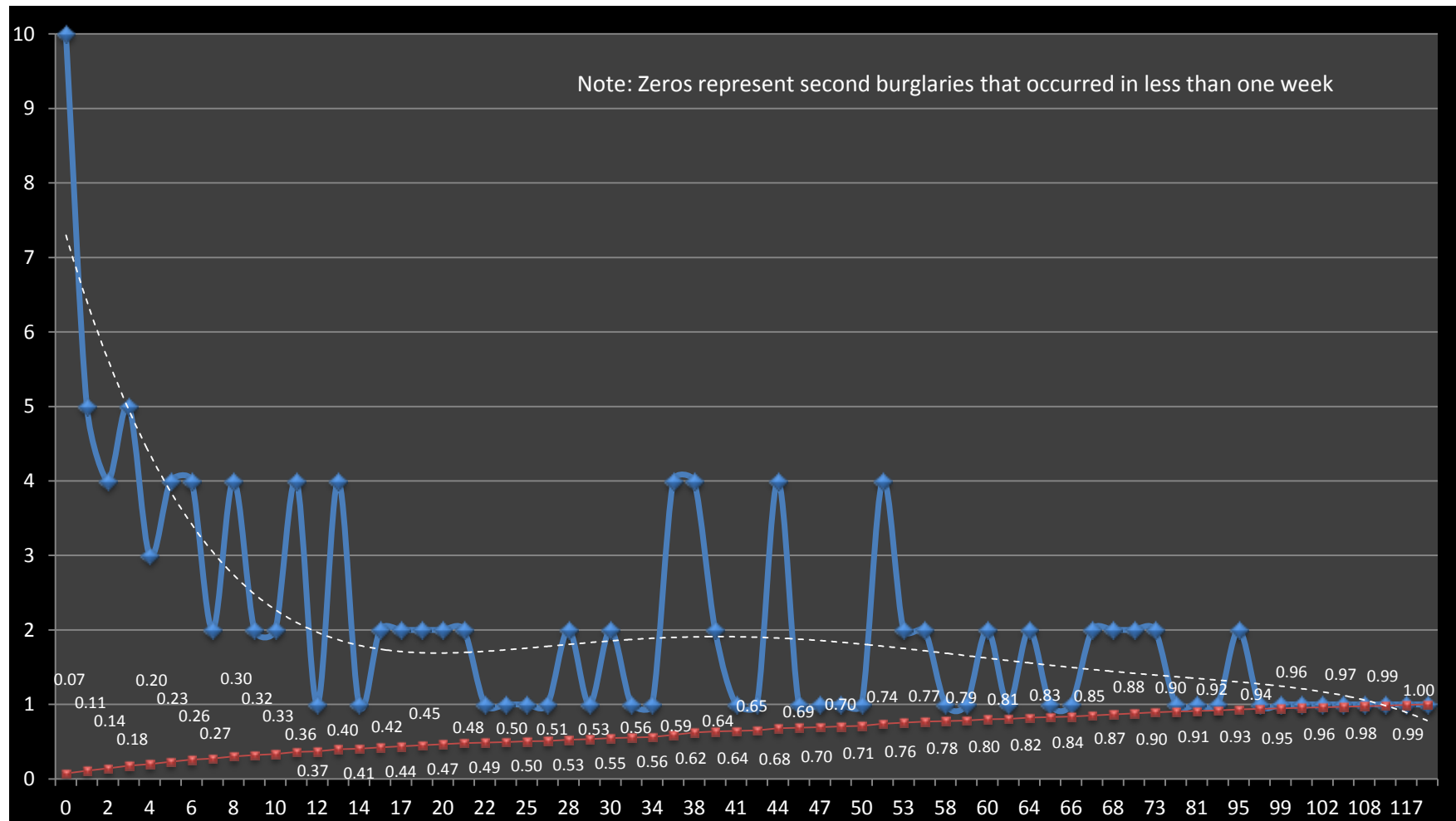
Figure 2. Months between 1st and 2nd North Region burglaries, 01/01/12 - 10/31/14

Note: Zeros represent second burglaries that occurred in less than one month.
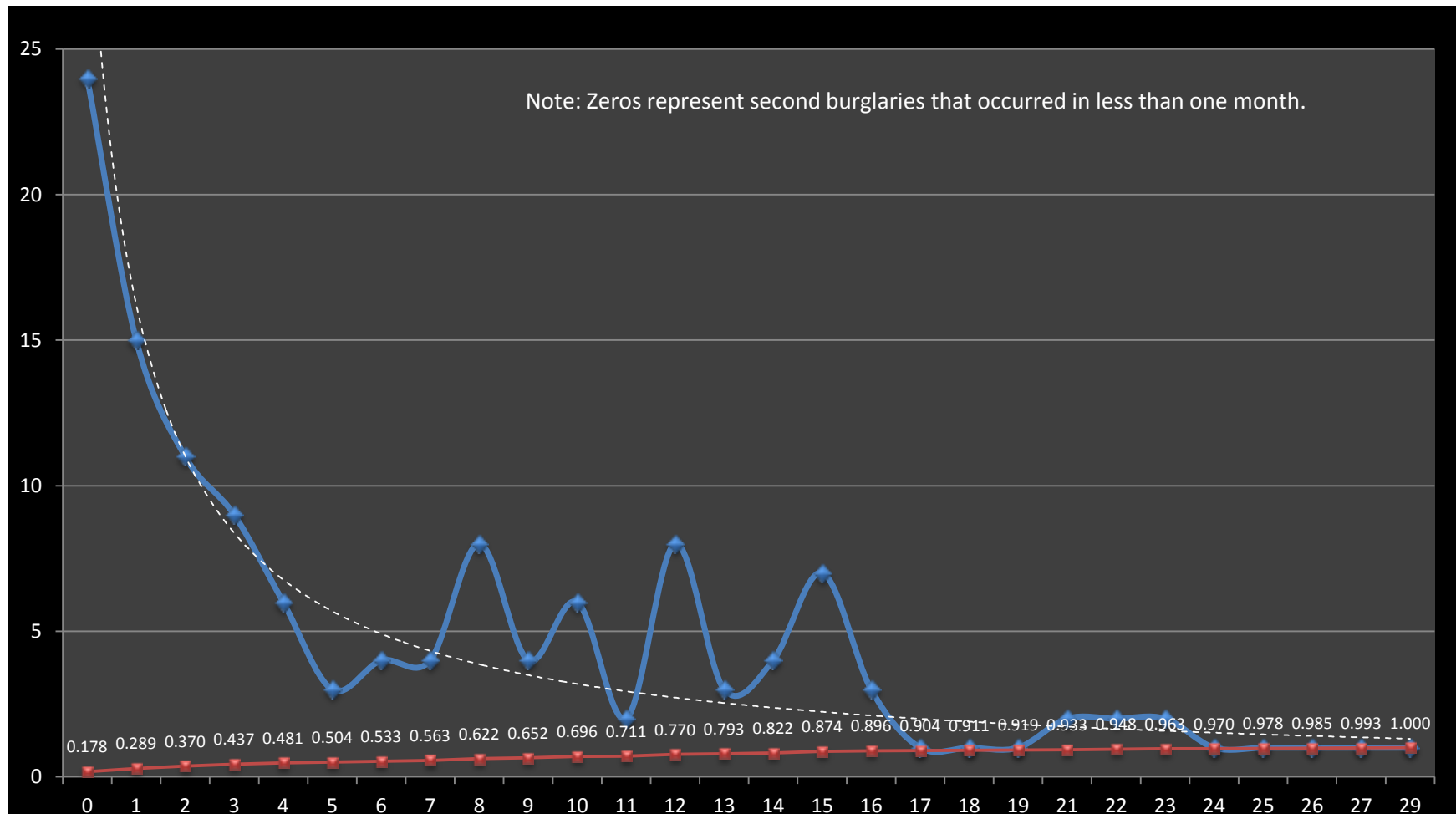
Figure 3. Weeks between 1st and 2nd Hyatt Park burglaries, 1/1/12 - 10/31/14

Note: Zeros represent second burglaries that occurred in less than one week

0.13 0.16 0.26 0.39 0.42 0.45 0.48 0.52 0.55 0.58 0.61 0.68 0.71 0.74 0.81 0.84 0.87 0.90 0.97 1.00
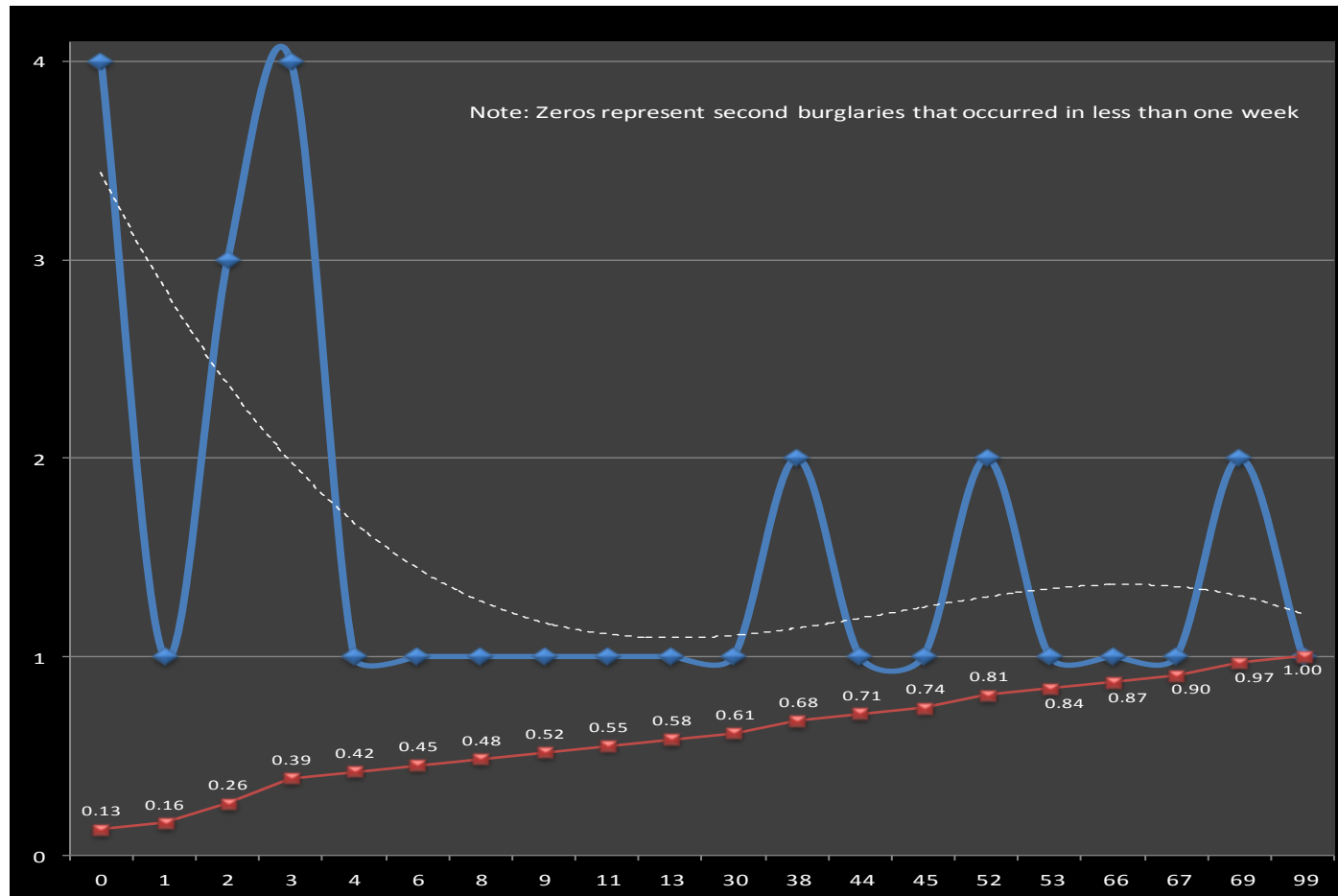
Figure 4. Months between 1st and 2nd Hyatt Park burglaries, 1/1/12 - 10/31/14

Note: Zeros represent second burglaries that occurred in less than one month
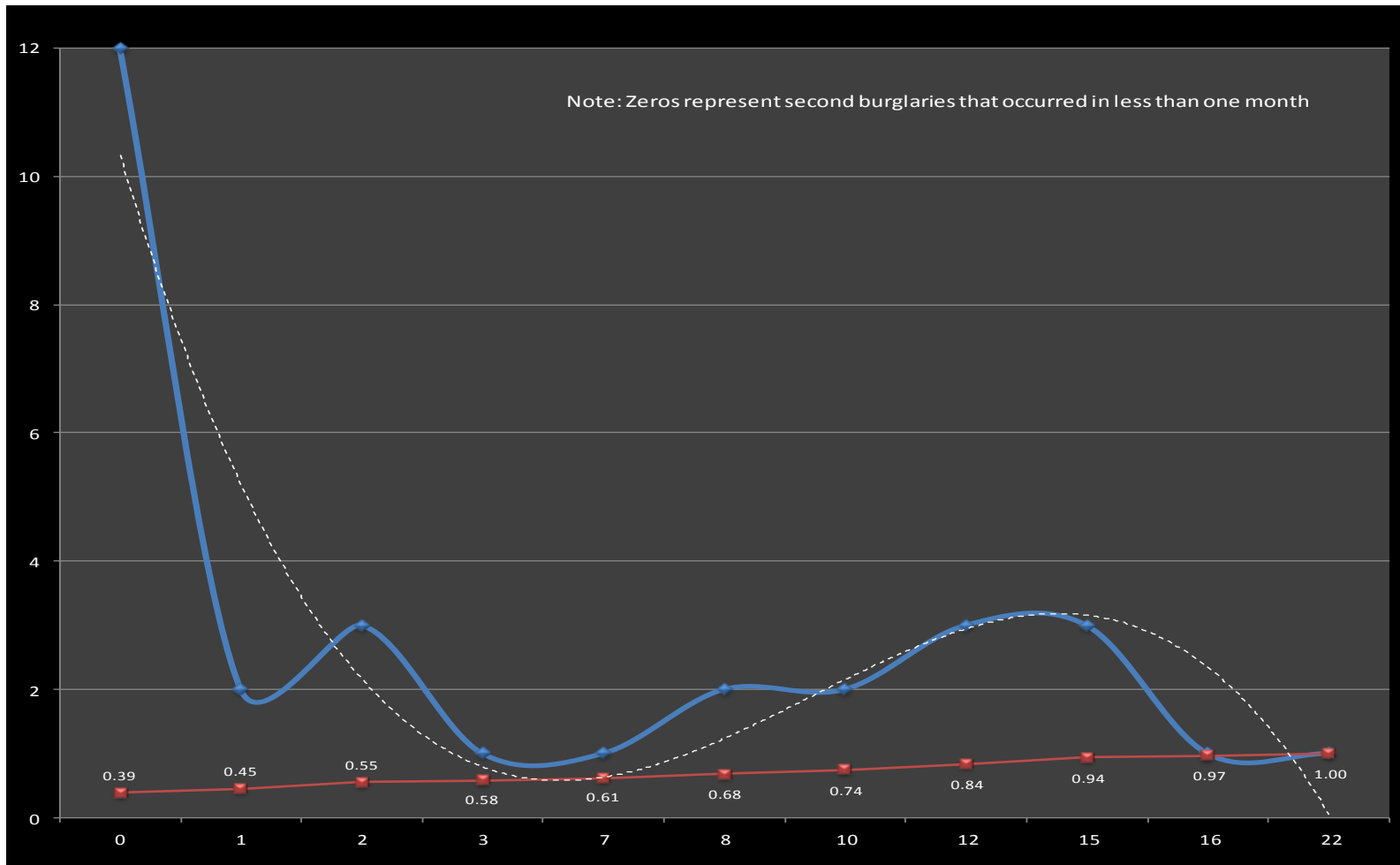
The temporal patterns in both Hyatt and the North Region demonstrate that the risk of a repeat burglary is high shortly following an initial one, but that the time interval between events is shorter in Hyatt. An important implication is that burglary reduction efforts should target initial or source burglary locations within a relatively short period of time of event occurrence to help prevent subsequent victimizations. Also, given the differences in the temporal patterns of repeats observed in the Hyatt study area and the North Region overall, intervention efforts implemented in different geographic areas (and/or different time periods) should check for unique patterns of repeats and tailor intervention efforts accordingly.

North Region and Hyatt Park Hot Spot and Repeat Burglary Descriptive Analyses

So far we presented descriptive statistics regarding the number of burglaries and repeats and the timing of repeat burglaries that occurred the North Region overall and the Hyatt study area. In this section, we present results based on spatial analyses of burglaries. Specifically, we present a series of maps for both areas that display the locations of residential burglaries as well as the locations of repeat burglaries. We also use kernel density estimation[3] to help identify potential burglary 'hotspots.'

North Region Analysis

Figure 5 shows a kernel density hotspot map[4] for the North Region, while Figure 6 shows the same map with geocoded burglary locations displayed. Figure 7 presents a zoomed-in view

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[3] Kernel density estimation is a nonparametric density estimator that uses all the data points (burglaries) to estimate how the density of events varies over the study area; it produces a smoothed density surface in which the density at every location reflects the number of points in the surrounding area. Kernel density maps help identify areas that appear to have a greater than expected number events (versus examining point locations only). For additional information, see:
http://help.arcgis.com/en/arcgisdesktop/10.0/help/index.html#/How_Kernel_Density_works/009z00000011000000/.
[4] The kernel density layer was generated using a search radius of 1,500 feet using square miles as the area unit and an output cell size of 30.

of the four hotspot areas (labeled HS1 to HS4) and the number of burglaries per address (see

Figure 8 for a closer view that includes street names). The two highest density burglary areas

(HS1 and HS2) are located in the northeast and northwest sections of the North Region,

respectively, with Hotspot 1 experiencing the greatest level of activity. Hotspots 3 and 4 are

located more southwest, with Hotspot 4 seemingly determined by a 'hotdot' – a single address

with a reported 24 burglaries.

Figure 5. North Region burglaries, 01/01/12 - 10/31/14: kernel density map
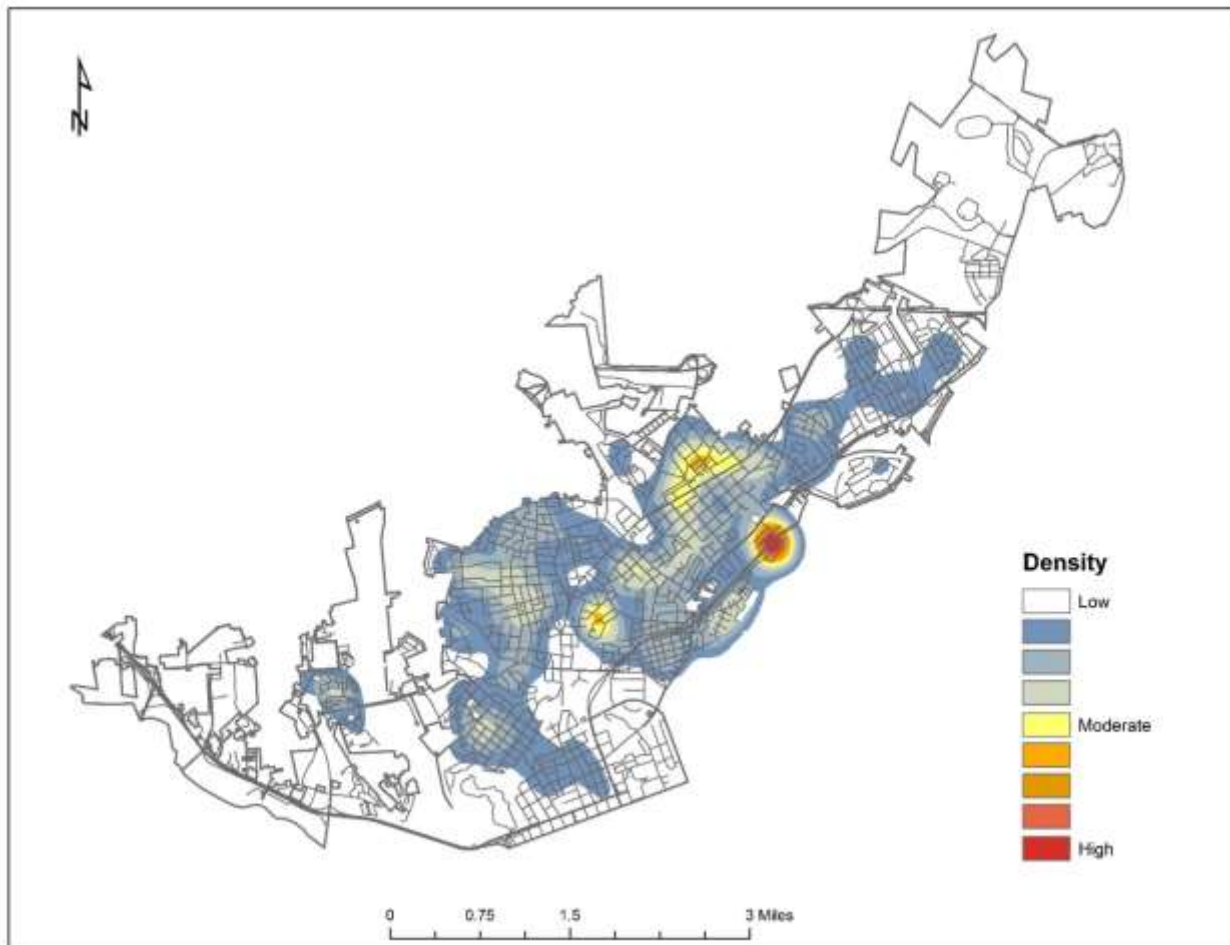
Figure 6. North Region burglary locations, 01/01/12 - 10/31/14: kernel density map
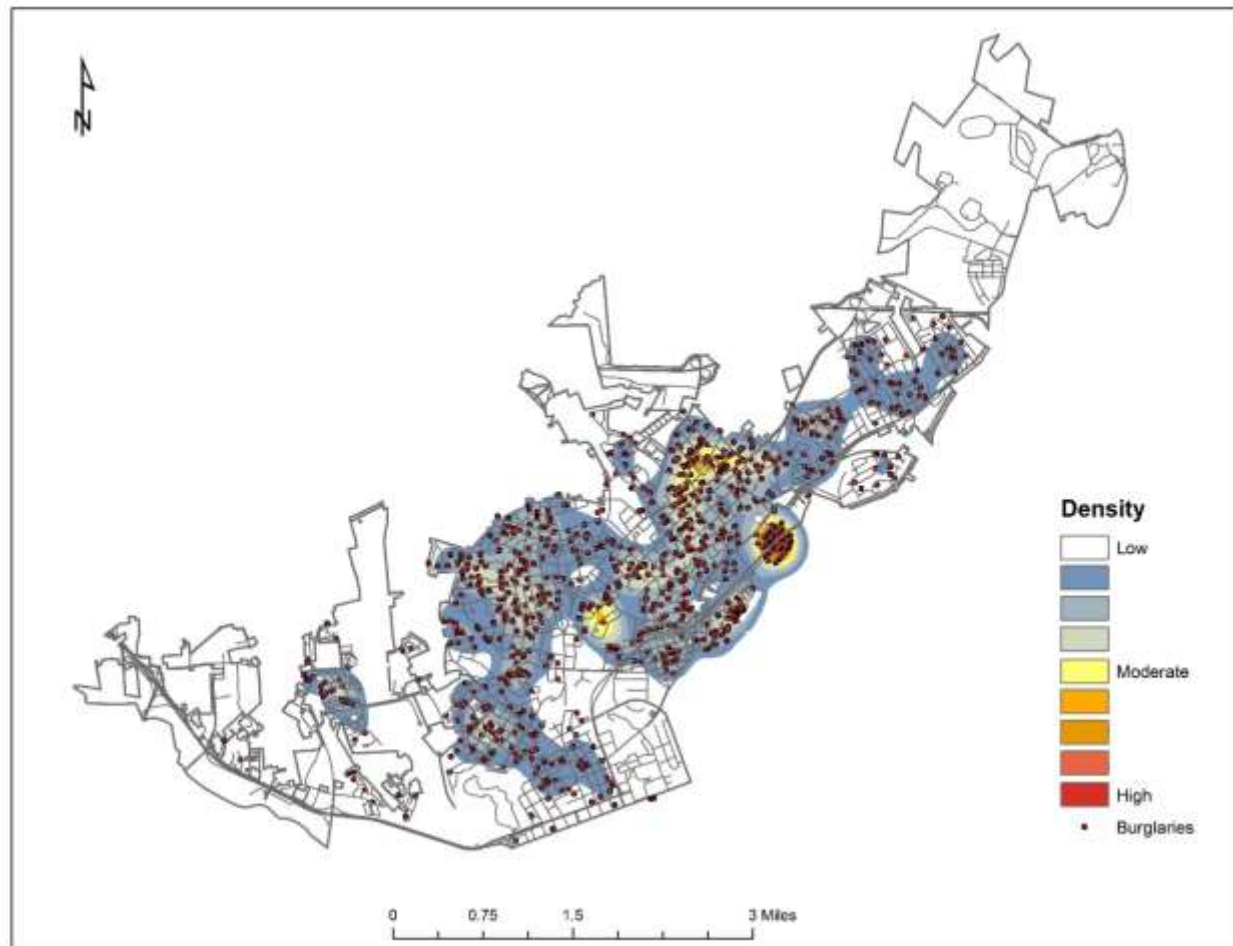
The map in Figure 7 also displays red and blue borders representing the Hyatt study area targeted for the burglary reduction intervention and a control area that was not targeted, respectively. The control area will be used later to help determine whether or not the intervention reduced burglaries in the Hyatt study area only or if there was a significant post-intervention decline in burglaries in the control area as well. If both areas experienced significant post-

intervention declines, it would suggest that the burglary reduction effort was not responsible for any observed decline in burglaries in the Hyatt study area. Using the same logic, we also test for significant post-intervention reductions in burglaries for the North Region overall.

Figure 7. Number of North Region burglaries per address, 01/01/12-10/31/14: kernel density map with Hyatt Study (red) and control area (blue) borders
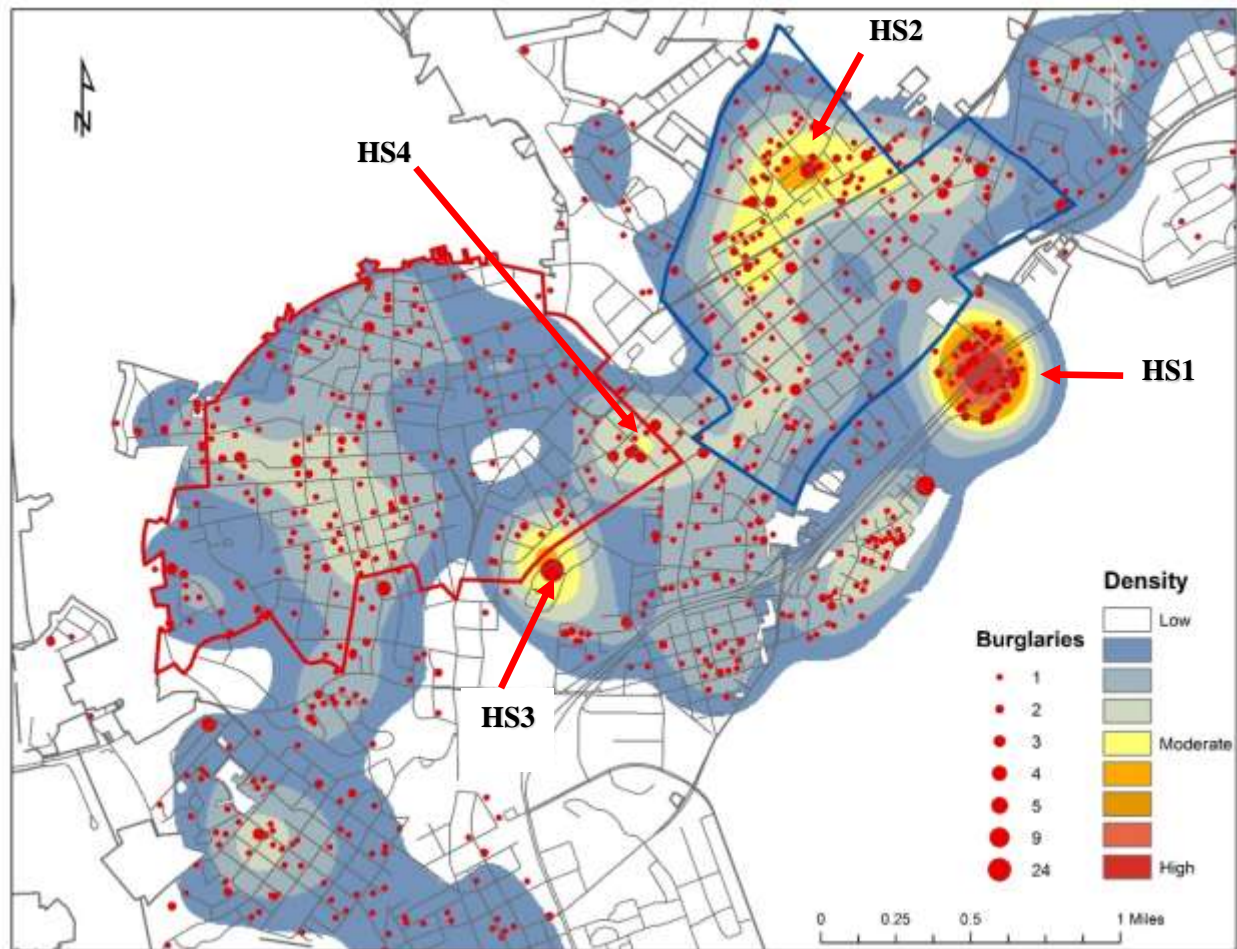
In our continued analysis of the high density burglary areas in the North Region below, we defer discussion of hotspot 4 as it is located primarily within the Hyatt study area, for which we conduct a separate analysis of hotspots and repeat burglaries.

Figure 8. North Region moderate-to-high density burglary areas
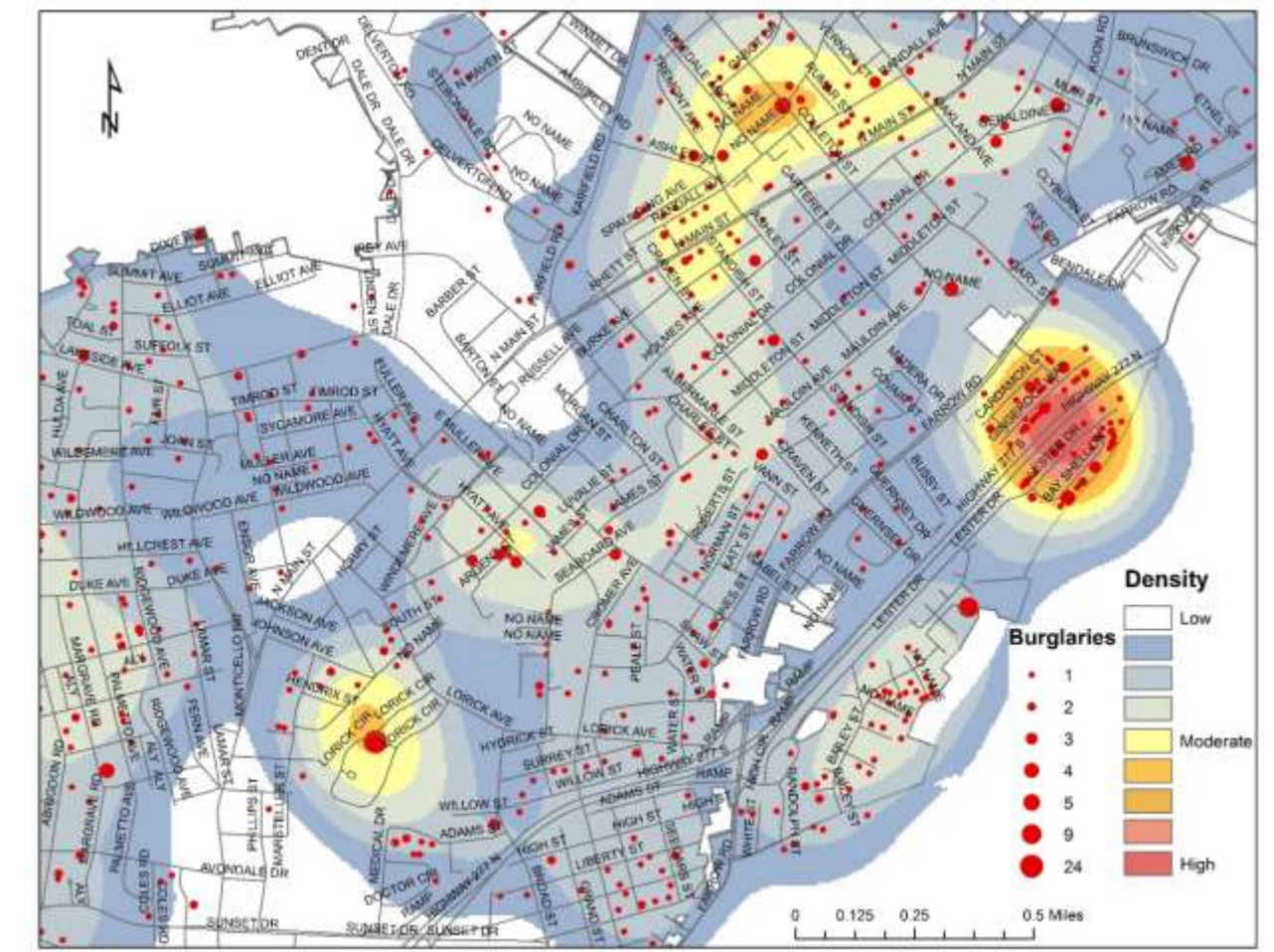
North Region Hotspot 1

Figure 9 presents a close-up view of the density bands and number of burglaries per address for Hotspot 1. Virtually all burglaries occurred within the core area of the hotspot (i.e.,

the four inner bands), which is bounded by Farrow Road to the northwest and the Southern

Railroad line just southeast of Bay Shell Drive. It is also notable that Highway 277 runs through

the center of the hotspot and the CSX Railroad runs through the outer band, just north of Farrow

Road. To explore the area further, we overlaid the density layer over a basemap downloaded

from Environmental Systems Research Institute (Esri).[5] As Figure 10 indicates, the core of the

hotspot directly overlays a housing development within which the majority of burglaries

occurred (see Figure 11 without the density layer for a clearer view of the residences and the

number of burglaries per address).

Figure 9. Zoomed view of North Region Hotspot 1
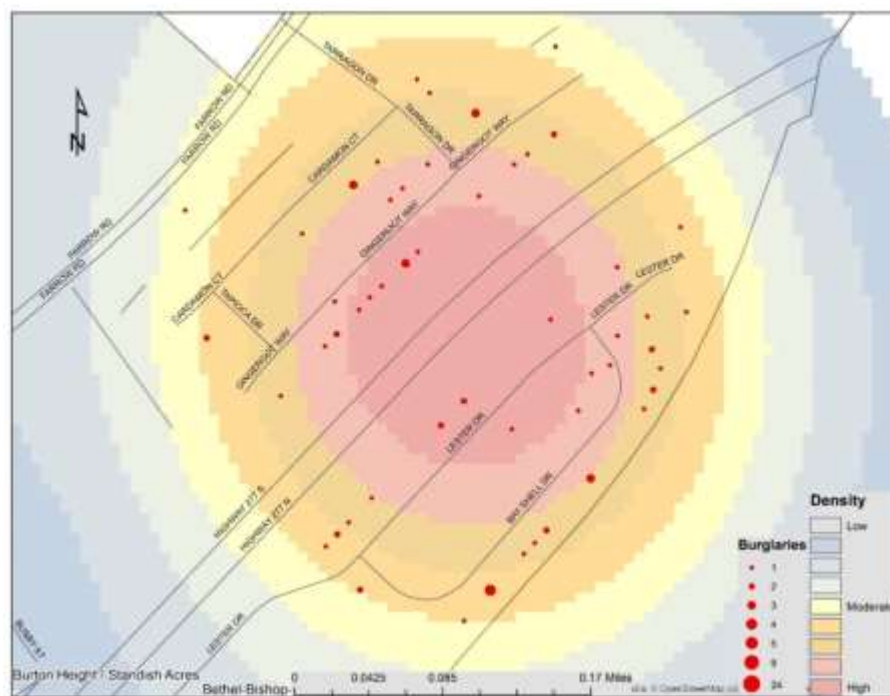
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Figure 10. Zoomed view of North Region Hotspot 1 with basemap

Figure 11. Zoomed view of North Region Hotspot 1 locations with basemap

We also observe that Hotspot 1 experienced a substantial number of repeat burglaries. For

instance, the residence at 114 Bay Shell Drive was burglarized 5 times during the study period

(Figure 12), while the following addresses were burglarized 3 times each:

- 132 Bay Shell Drive
- 109 Cardamom Court
- 118 Gingeroot Way
- 211 Gingeroot Way

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Ten additional residences were burglarized twice. Given the number of burglaries and repeat burglaries concentrated in this area, it would make a good target for a burglary reduction intervention.

Figure 12. Satellite image of residence burglarized 5 times

Source: Imagery @2015 Google, Map data @2015 Google

One census block group (010900-2) largely intersects the central band of Hotspot 1. Table 9 presents some basic economic and demographic characteristics of this area. As the table reveals, this area is characterized by high rates of poverty, low per capita and median household incomes, and a vast majority African-American population.

Table 9. Characteristics of block group 010900-2

Characteristic	Value	Year(s)
Per Capita Income	$5,119	2008-2012
Median Household Income	$10,338	2008-2012
Families Living in Poverty	71.56%	2008-2012
African-American	97.04%	2010

Source: http://www.usa.com/columbia-sc.htm

We also observe a high repeat address at 100 Ripplemeyer Avenue with 9 reported burglaries, which is located south and slightly west of the center of Hotspot 1 (see Figure 8). However, this is the location for Bethel Bishop Chappelle Memorial Apartments, a Section 8 apartment complex[6] containing 188 assisted living units.[7] It is likely, therefore, that the burglaries were actually distributed throughout the complex and officers used 100 Ripplemeyer Avenue as a 'catchall' address for reporting purposes.

North Region Hotspot 2

Figure 13 shows Hotspot 2, while Figure 14 shows the basemap overlaid with the core density bands and Figure 15 excludes the density bands. The core area of Hotspot 2 (yellow and orange bands) is bounded by Fairfield Road to the northwest, Oakland Avenue to the northeast and Holmes Avenue to the south. The burglaries here are substantially more dispersed over a wider geographic area than those in Hotspot 1. Further, although many incidents fall within the core area, substantial numbers fall outside of it. The inner core (yellow band) contains Gable Oaks Apartments, which is a 200-unit rental housing community containing 60 apartments

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[6] Section 8 Rental Assistance Programs offer rental assistance to persons with low-income who wish to live in homes in the private rental market, but cannot afford market rental rates. Section 8 participants pay 30% of their adjusted gross income for rent and utilities. The Housing Authority Assistance Payments Program subsidizes the balance of rent for the property owner (see: http://www.chasc.org/section-8.html).

[7] See http://affordablehousingonline.com/housing-search/South-Carolina/Columbia/Bethel-Bishop-Chappelle-Memorial-Apartments/45348/.

designated as Section 8 assisted living units (see http://section-8-

housing.credio.com/l/11583/Gable-Oaks).

Figure 13. Zoomed view of North Region Hotspot 2
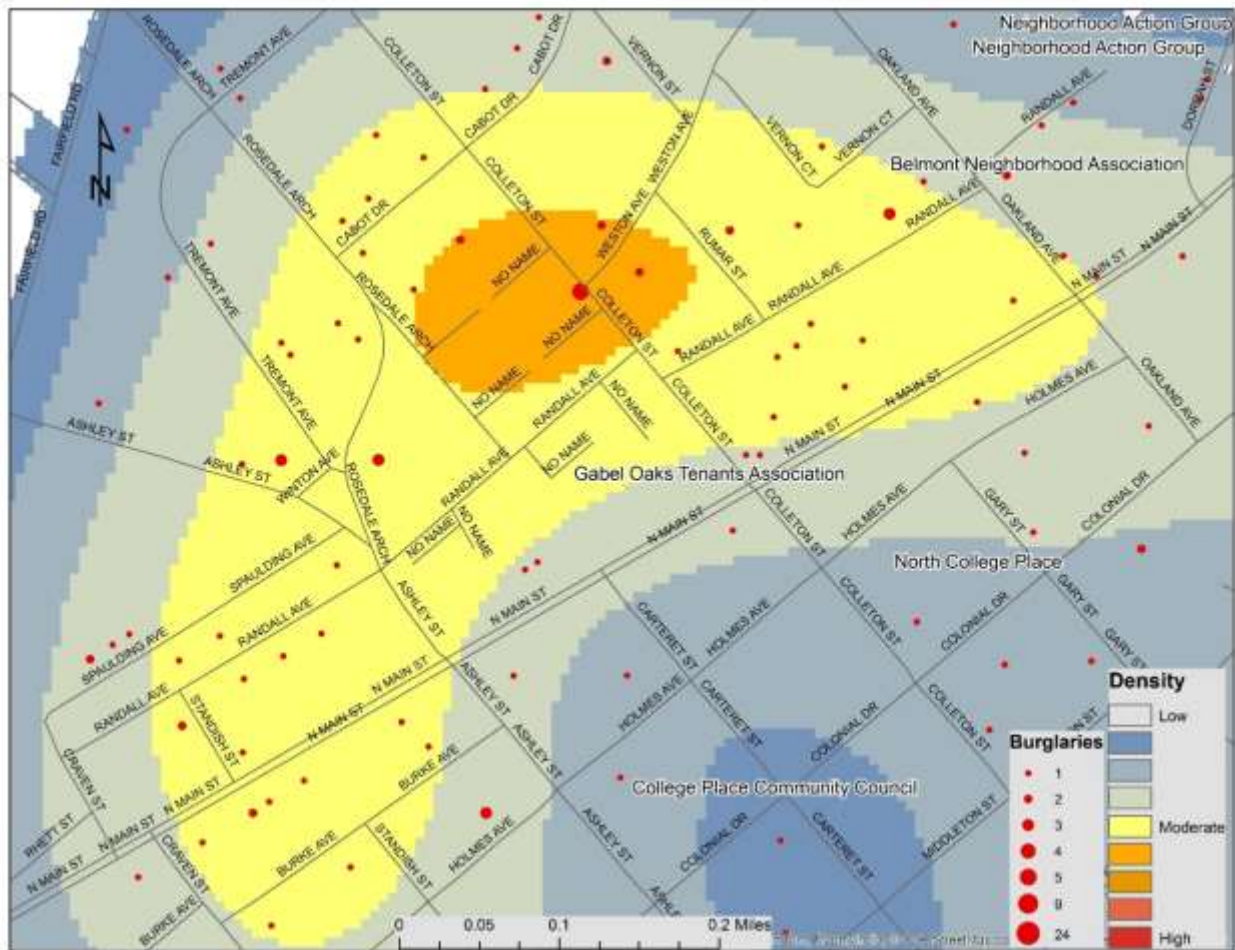
Figure 14. Zoomed view of North Region Hotspot 2 with basemap
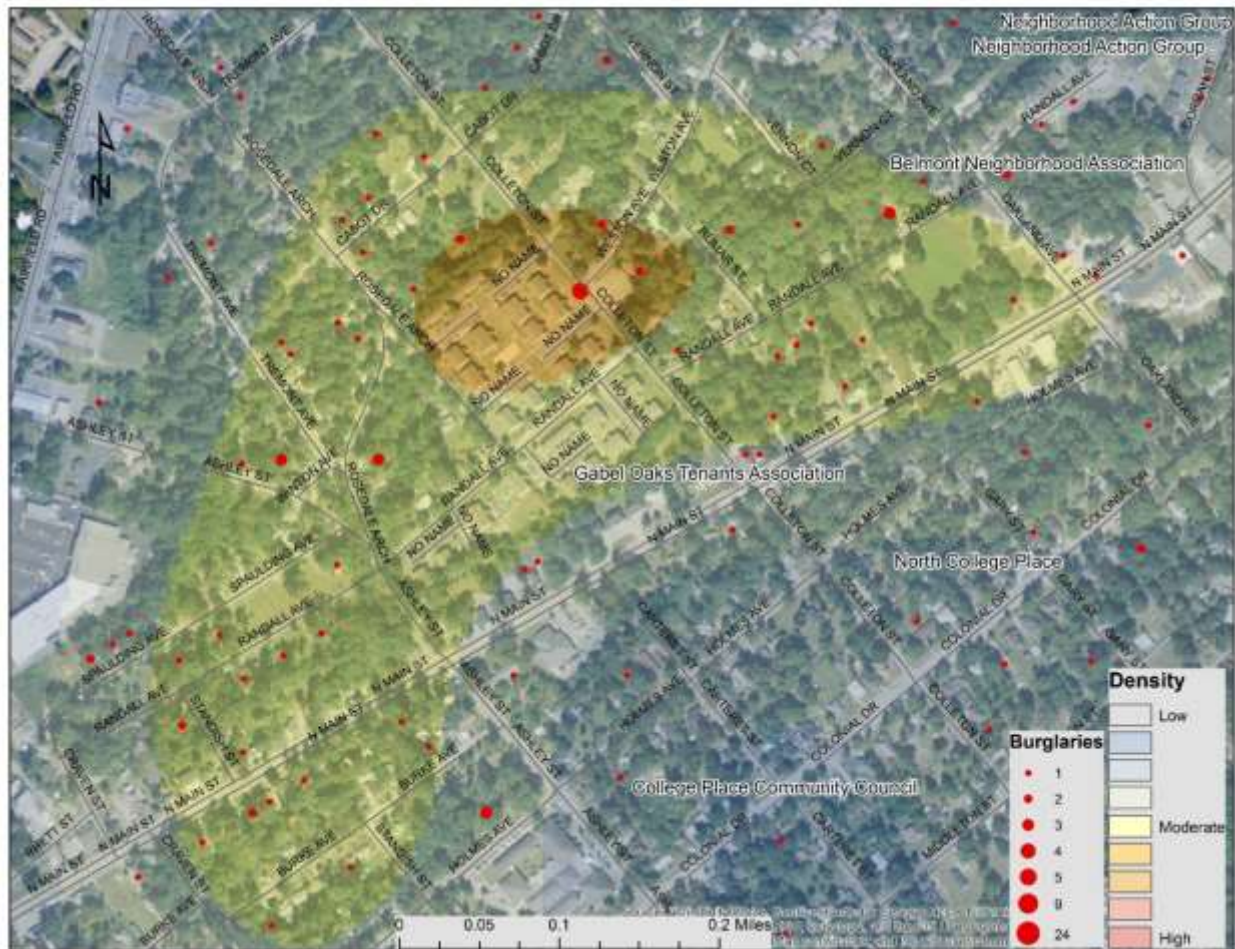
Figure 15. Zoomed view of North Region Hotspot 2 locations with basemap

It is very unlikely that all 5 of the reported burglaries within the Gable Oaks apartment complex occurred at 901 Colleton Street. An online search for Gable Oaks indicates this is the address listed for the complex. Almost certainly officers used the 901 Colleton Street address as a convenience for reporting purposes.

Census block group 010600-2 encompasses the core inner density band (orange) as well as a substantial portion of the second density band (yellow). Table 10 indicates this area is also

characterized by high rates of poverty, low per capita and median household incomes, and a majority African-American population. Relative to the block group in Hotspot 1, however, per capita and median household incomes are approximately double, families living in poverty is about 30% lower, and the proportion of the population that is African-American is about 10% lower.

Table 10. Characteristics of block group 010600-2

Characteristic	Value	Year(s)
Per Capita Income	$12,172	2008-2012
Median Household Income	$26,058	2008-2012
Families Living in Poverty	41.35%	2008-2012
African-American	87.77%	2010

Source: http://www.usa.com/columbia-sc.htm

North Region Hotspot 3

Figure 16 presents a zoomed-in view of Hotspot 3, while Figure 17 adds the basemap and Figure 18 shows the basemap only along with the burglary locations. The core of this hotspot (yellow and orange density bands) is bounded approximately by Marsteller Street to the west, Western Avenue to the east, Glendon Road to the northwest and Lorick Avenue to the northeast. The core area of the hotspot contains only two burglary locations. The one located just above Glendon road is a single burglary incident whereas the one at 100 Lorick Circle consists of 24 incidents. This address is for Latimer Manor Apartments, therefore the 24 burglaries must have occurred at various locations throughout the Latimer Manor community (note that this is a large apartment complex that is encompassed by the core hotspot).

Figure 16. Zoomed view of North Region Hotspot 4

Figure 17. Zoomed view of North Region Hotspot 4 with basemap
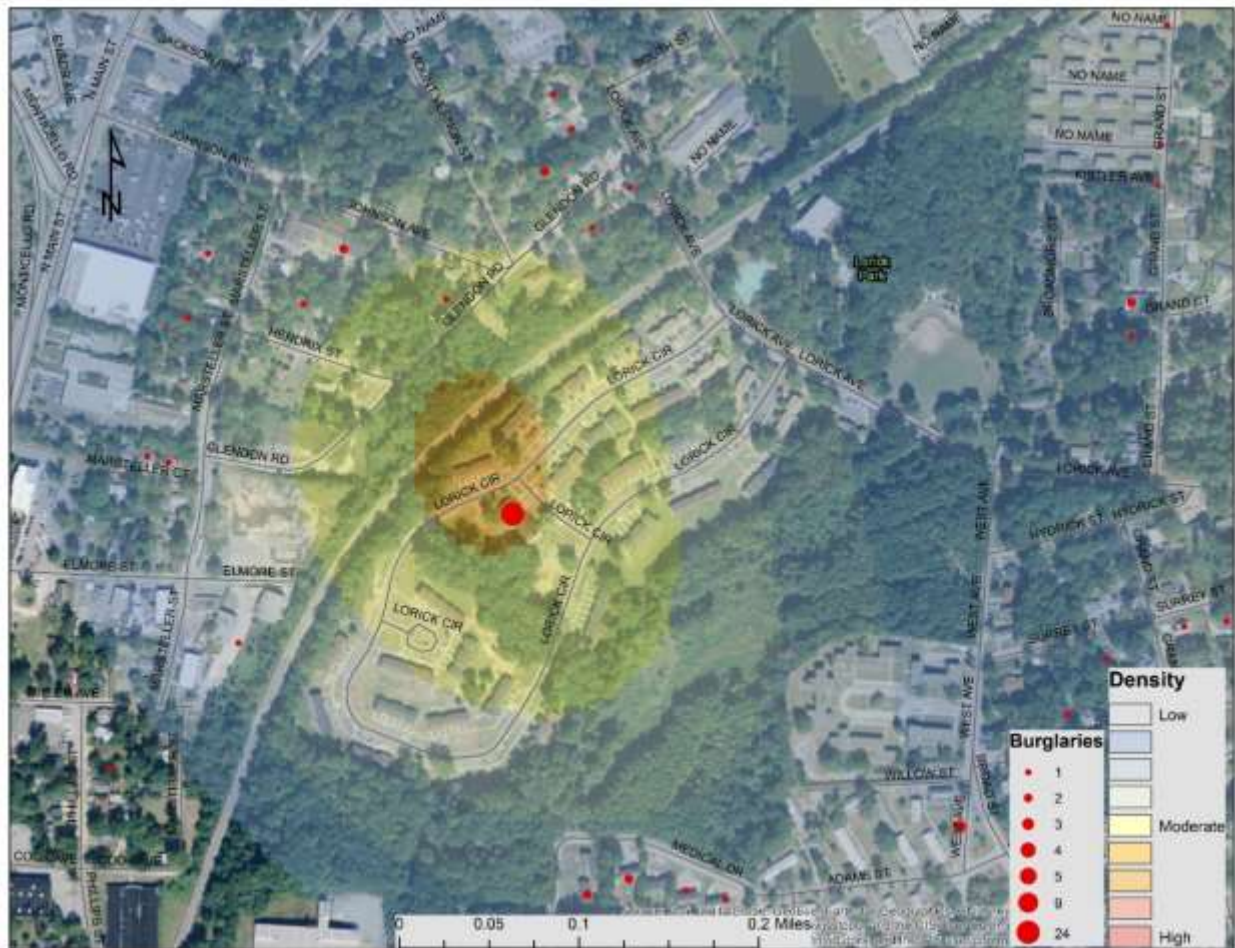
Figure 18. Zoomed view of North Region Hotspot 4 locations with basemap
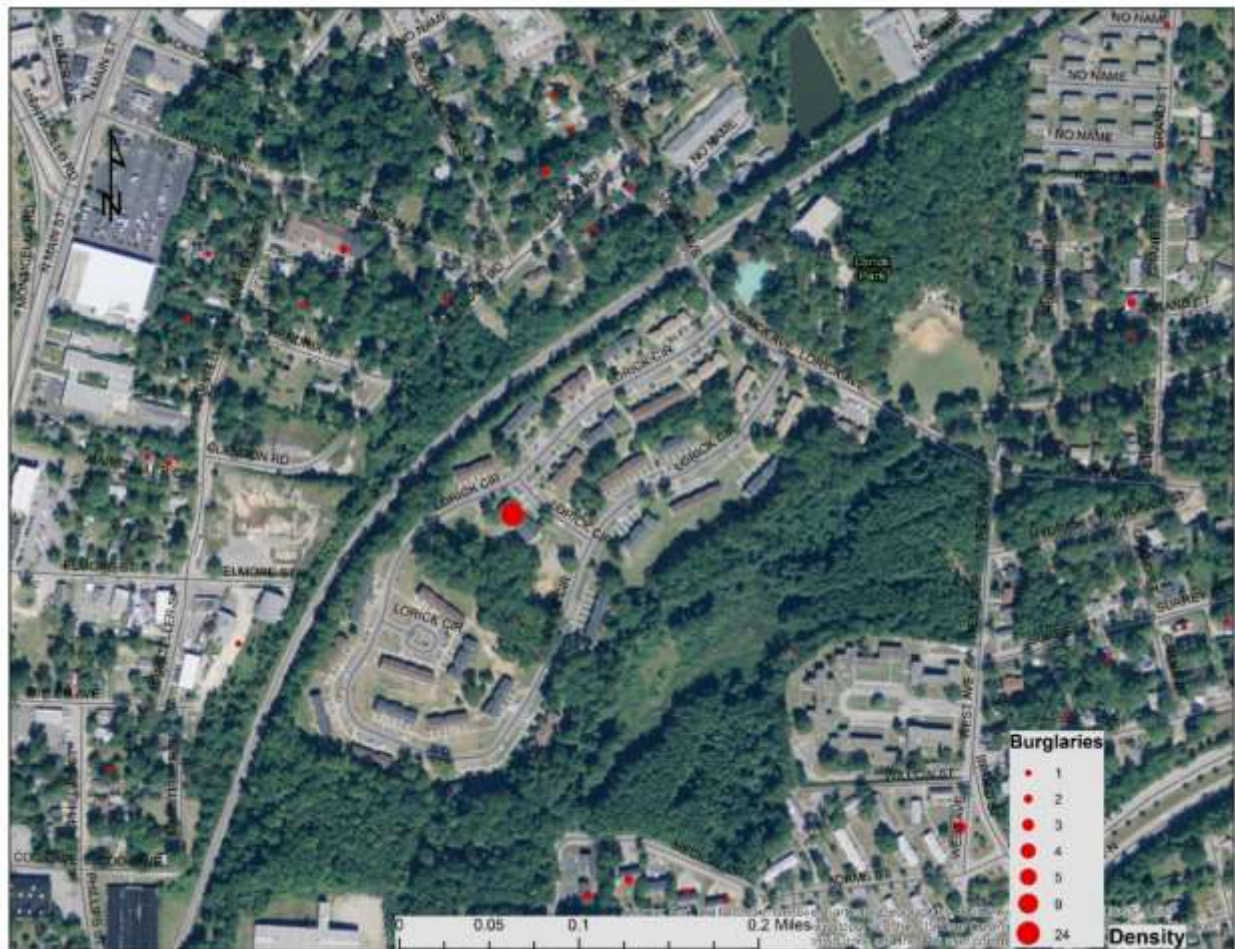
The Lorick Circle/Manor Apartments area is contained within block group 000500-2, but as shown in Figure 19, it is adjacent to block group 000200-1. Therefore, to obtain a sense of the basic economic and demographic characteristics of the hotspot area, statistics for both block groups are presented in Table 11.

Figure 19. Block groups 000200-1 and 000500-2
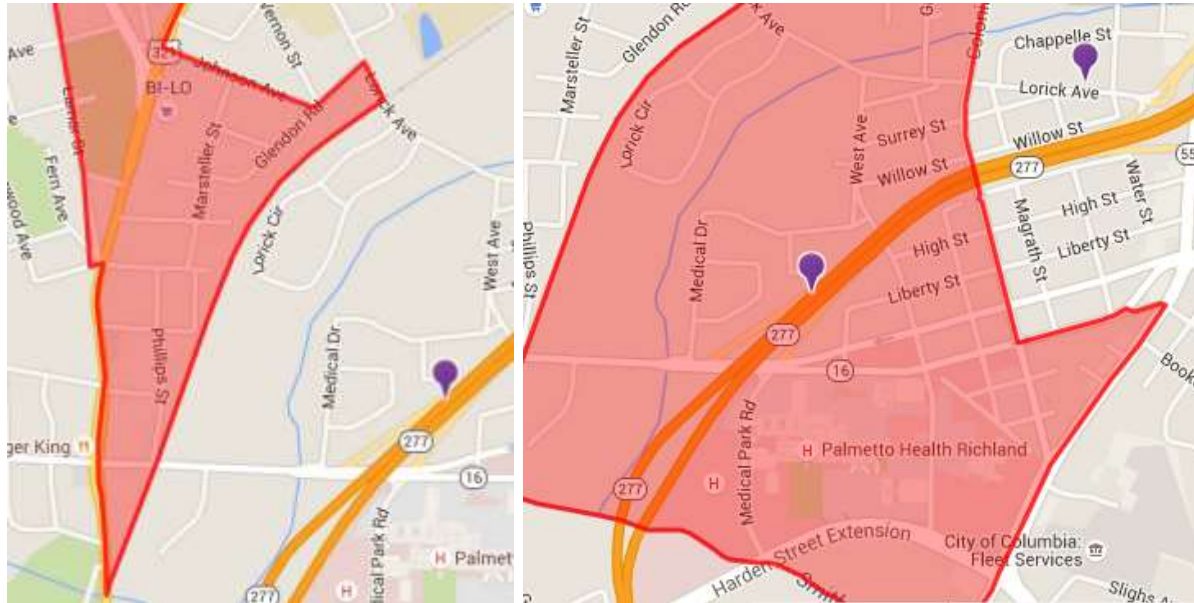
Table 11 indicates that block group 000500-2, which encompasses the Lorick

Circle/Manor Apartments area, is substantially worse off economically and contains a larger

African-American population than the block group located just to the west and north of the area.

The values for this block group are also similar to those for the block group for Hotspot 2. And

although both of these areas are characterized by low per capita and median household incomes

and high rates of poverty, economically these areas are substantially better off than the block

group associated with Hotspot 1. That said, we would be remiss not to caution readers that the

block groups examined here (and following) contain information for varying geographical areas

and comparisons across hotspots are not precise. More refined analyses in the future would be

useful (e.g., statistics for blocks within hotspots).

Table 11. Characteristics of Block Groups 000200-1 and 000500-2

Block Group	000200-1	000500-2	
Characteristic		Values	Year(s)
Per Capita Income	$18,776	$11,478	2008-2012
Median Household Income	$34,604	$19,114	2008-2012
Families Living in Poverty	16.67%	50.81%	2008-2012
African-American	72.70%	90.40%	2010

Source: http://www.usa.com/columbia-sc.htm

Hyatt Park Study Area Analysis (Hotspot 4)

Because the study area chosen for the burglary reduction intervention is located within Hyatt Park, we conducted a separate analysis for this area. Note that the geographic scale of the analysis is different than for the North Region overall and the kernel density pattern is different.[8] Of course, the burglary locations and number of repeats are the same regardless of scale.

Figure 20 displays a map of the study area that includes a kernel density layer and the address locations of burglary incidents. Interestingly, the primary hotspot within the study area, located to the east and centered on the intersection of Hyatt Avenue and Argent Court, is virtually identical to the location of Hotspot 4 displayed earlier for the North Region (see Figure 7). We also note – as shown in Figure 21 – this hotspot experienced more repeat burglaries than any other location within the study area and is therefore the focus of this analysis. Figures 22 – 24 present various close-up views of the hotspot. As can be seen, 3 locations within the core of the hotspot were burglarized 3 times each, while another was burglarized twice. Three additional locations were burglarized one time. The addresses for the repeat locations are:

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[8] This kernel density layer was generated using a search radius of 500 feet using square miles for the area unit and an output cell size of 100.

- 4400 Wentworth Drive   (3x)
- 4185 Argent Court   (3x)
- 1516 Hyatt Avenue   (3x)
- 4417 Argent Court   (2x)

Figure 20. Hyatt study area burglary locations 01-01-12 – 10/31/14 and density map

Figure 21. Hyatt study area number of burglaries per address 01/01/12 - 10/31/14 and density map
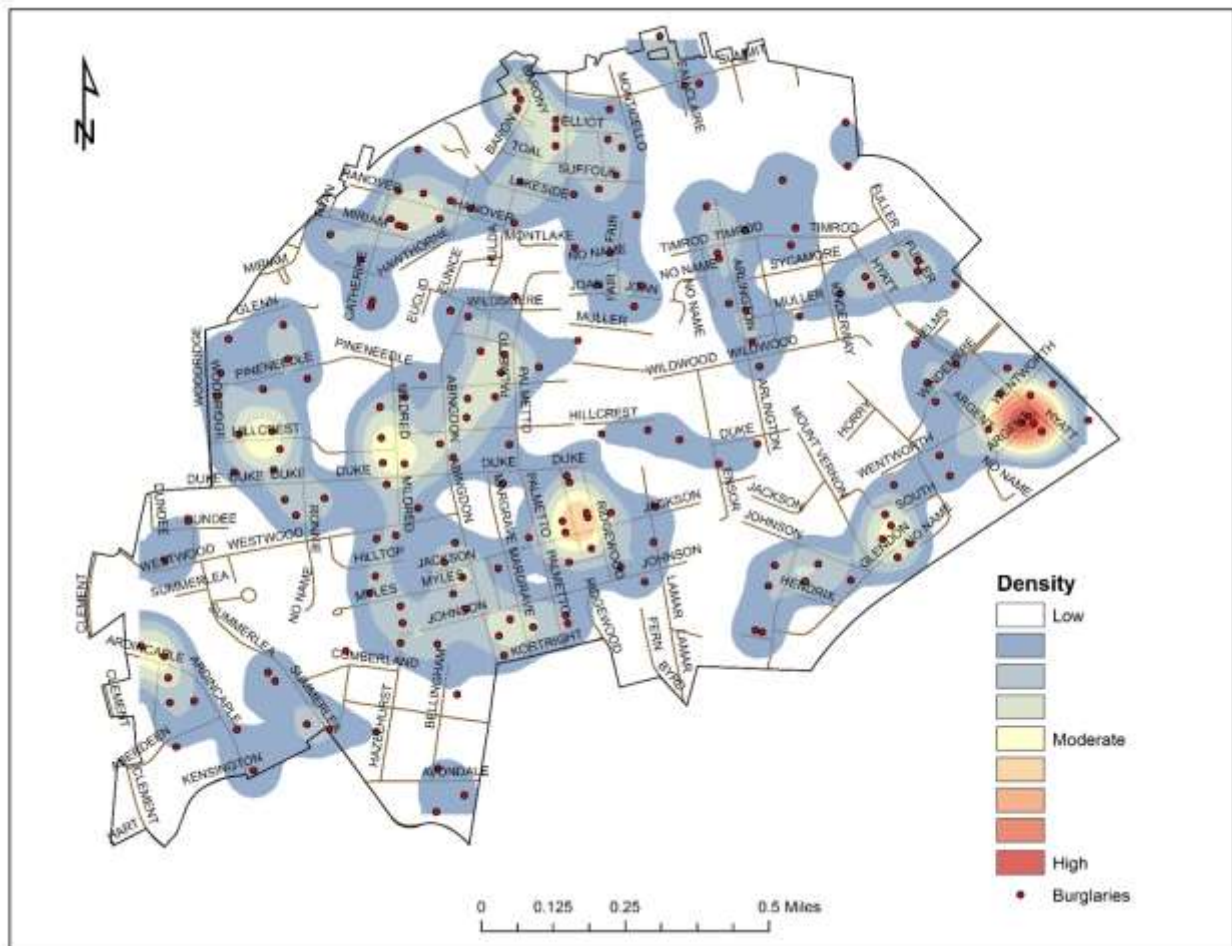
Figure 22. Zoomed view of Hyatt Study Area Hot Spot
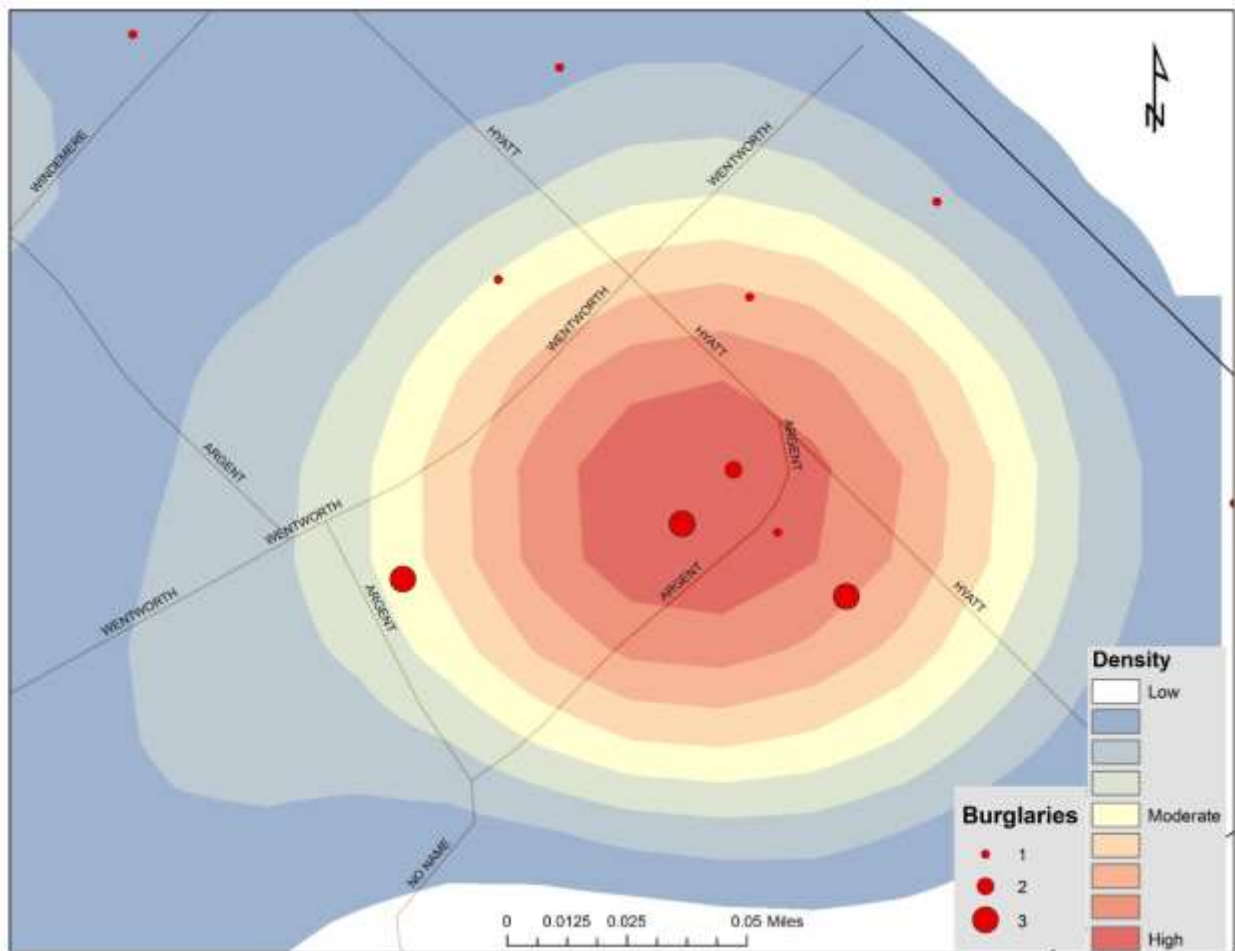
Figure 23. Zoomed view of Hyatt Study Area Hot Spot with basemap
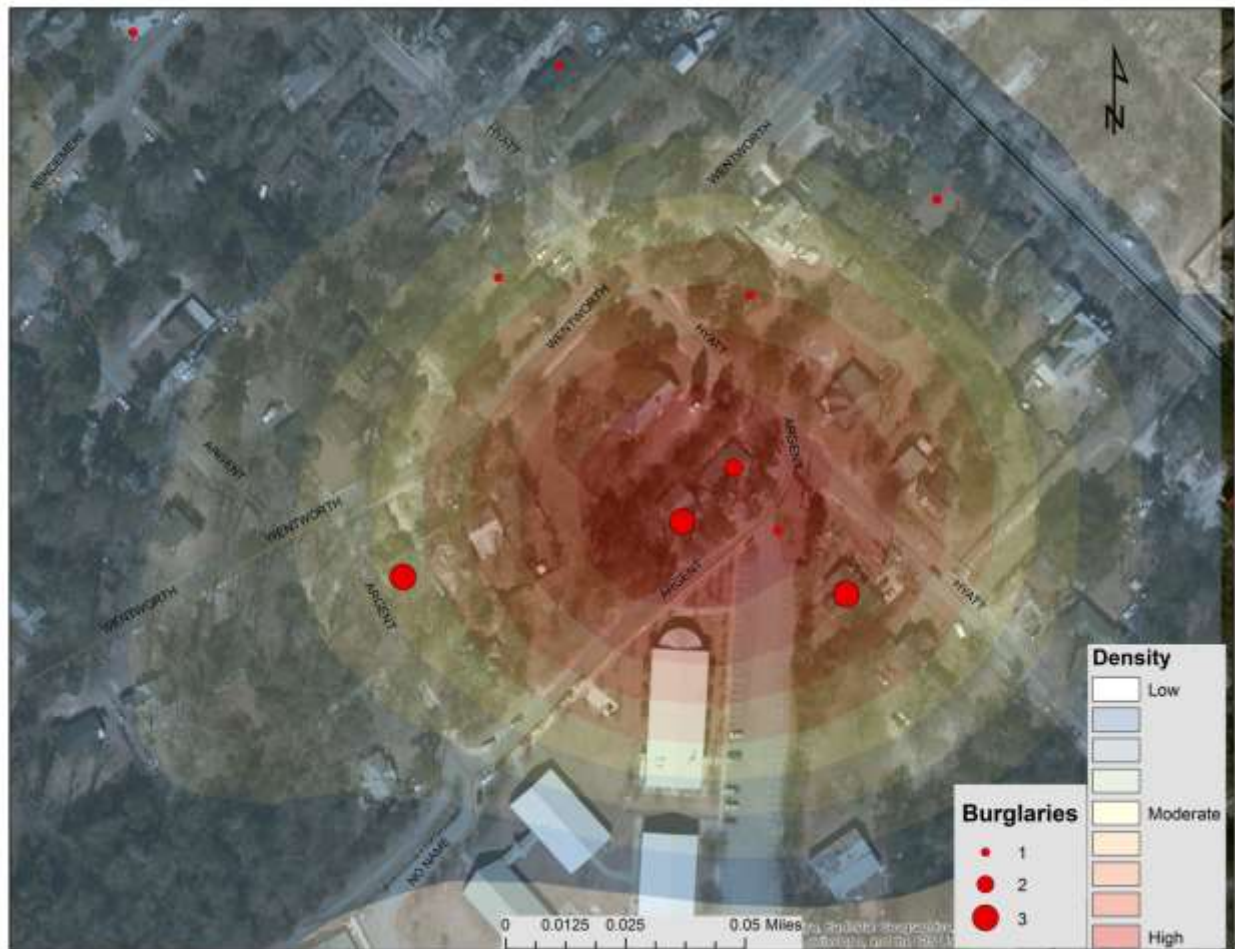
Figure 24. Zoomed view of Hyatt Study Area with locations and basemap

These repeat burglary locations consisted of detached, single-family homes, as shown in

Figure 25. Moving from the top left to the bottom right, these homes are located at 4400

Wentworth Drive, 4185 Argent Court, 1516 Hyatt Avenue, and 4417 Argent Court, respectively.

Figure 25. Hyatt Study Area showing repeat burglary residences within the primary hotspot

Source: Imagery @2015 Google, Map data @2015 Google.

As indicated in Table 12, the primary hotspot in the Hyatt study area is characterized by low per capita and median household incomes, a high percentage of families living in poverty and a majority African-American population, characteristics similar to the other hotspots already examined.

Table 12. Characteristics of block group 010600-2

Characteristic	Value	Year(s)
Per Capita Income	$18,815	2008-2012
Median Household Income	$18,750	2008-2012
Families Living in Poverty	46.62%	2008-2012
African-American	85.09%	2010

Source: http://www.usa.com/columbia-sc.htm

Five other locations across the study area experienced 3 repeat burglaries, while another 22 experienced 2 repeats. All the locations burglarized 3 times were single-family detached homes and are located at the following addresses (images not shown):

- 401 Lakeside Avenue
- 111 Hillcrest Avenue
- 4203 Mildred Avenue
- 3916 Ardincaple Drive
- 631 Dixie Avenue

North Region and Hyatt Park Repeat and Near-Repeat Burglary Statistical Analyses

Visual inspection of the maps suggests several areas in which burglaries and/or repeat burglaries tend to cluster together. Theory and prior empirical evidence suggest that not only does an initial or source burglary increase the risk of one or more subsequent burglaries at the same location within a relatively short period of time, but also that an initial or source burglary increases the risk of one or more burglaries at nearby locations ("near-repeats") within a relatively short distance and period of time (see, e.g., Anderson, 2014; Johnson, 2008; Shurt, Orsogna, Brantingham & Tita, 2009; Townsley, Homel & Chaseling, 2003). While it is easy enough to display the locations of burglaries and repeat burglaries, visual inspection alone cannot tell us if there is statistical evidence for the repeat and near-repeat phenomena. Based on the spatial locations and timing of burglaries and repeat burglaries, tests of significance can be computed using the program "Near-repeat Calculator" (Ratcliffe, 2009). After inputting the X, Y coordinates and date of each event, the program looks for unusual patterns in the spatio-temporal relationships between all burglary locations within an area. Specifically, the software compares the actual pattern of spatio-temporal relationships between all points – the observed pattern –

with a pattern one would expect if there were no repeat or near-repeat processes taking place (i.e., the expected or random pattern).

In the epidemiological literature, this is frequently referred to as the Standardized Incidence Ratio (SIR), calculated by dividing the observed number of events by the expected number (Although not necessary in our case, the SIR is typically standardized on some relevant factor, such as age). If the resulting ratio is greater than 1, then there are more events than expected; if it is less than one, then there are fewer events than expected. A ratio of 1 would indicate no more or fewer events than expected. A nice feature of the SIR is that it has a simple interpretation. For example, if the number of observed burglaries is 10 and the expected number is 5, the SIR = 2.0. Since 2.0 is 100% greater than 1.0, we can say there were 100% more burglaries than expected. If 25 burglaries were observed and 20 were expected, then the SIR = 25/20 = 1.25 or 25% more burglaries than expected. Because we are not standardizing, hereafter we use the term Incidence Ratio (IR).[9]

Confidence intervals are then generated and tests of significance calculated to determine the probability that the observed results are due to chance. According to Ratcliffe (2009:8):

> …the expected pattern is derived from a redistribution of date values randomly reallocated to the spatial points. For this process to be statistically valid, this random reallocation has to be performed many times. Within the social sciences, the standard minimum threshold for statistical significance is p = 0.05.

Using Monte Carlo methods this can be achieved with 20 reallocations or iterations. A p-value of .05 means that the observed pattern would be expected to occur by chance only 5 times

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[9] For additional information, see New Jersey Department of Health & Senior Services Cancer Epidemiology Services. Fact sheet: explanation of standardized incidence ratios, available at http://www.state.nj.us/health/eohs/passaic/pompton_lakes/pompton_lakes_fs_sir.pdf.

out of 100. However, a more conservative (or robust) result can be achieved by specifying additional iterations. As Ratcliffe (2008:8) notes, 100 iterations or a p-value of .01 would "produce results that are statistically valid and universally acceptable." This is the standard used for the following analyses, though we consider the risk of repeats and near-repeats to be statistically significant at a p-value ≤ .05.

Analyses are conducted for the North Region overall and separately for the Hyatt Park study area. The near-repeat calculator software requires the user to specify several parameters. For all estimations, these were set to the following values:

- Iterations: 99
- Spatial bandwidth: 500 feet
- Number of spatial bands: 6
- Number of temporal bands: 12
- P-value: .01
- Distance: Manhattan

One additional required parameter is the temporal bandwidth. Starting with a bandwidth of one week, this was increased in 7 day increments up to 21 days, as based on the temporal analysis conducted earlier we expect the risk of repeat and near-repeat burglaries to be greatest within a relatively short period of time.

North Region Findings

Using a 7 day temporal bandwidth, the results provide statistical evidence of an increased risk of both repeat and near-repeat residential burglaries within the North Region. According to the analysis (output not shown), there is evidence of an increased risk of repeat residential burglaries up to 21 days following the occurrence of a source incident. As shown in the graph in

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Figure 26, the risk is statistically insignificant for the intervals of 22-28 days (4th week) and 29-35 days (5th week). However, the risk is significant during the 6th, 7th, and 8th weeks. Importantly, the period of greatest risk is during the first 7 days ($IR = 3.19$, $p = .01$). Thus, we can say that within the first week of an initial burglary the risk of a repeat is 219% greater than if there were no repeat burglary pattern. The risk is virtually identical during the second week ($IR = 3.16$, $p = .01$) and somewhat lower during the third week, but still substantive and statistically significant ($IR = 2.36$, $p = .01$). For prevention purposes, therefore, we can conclude that the first couple of weeks following a source burglary is critical.

Figure 26. Risk of repeat burglaries using 7-day intervals, North Region
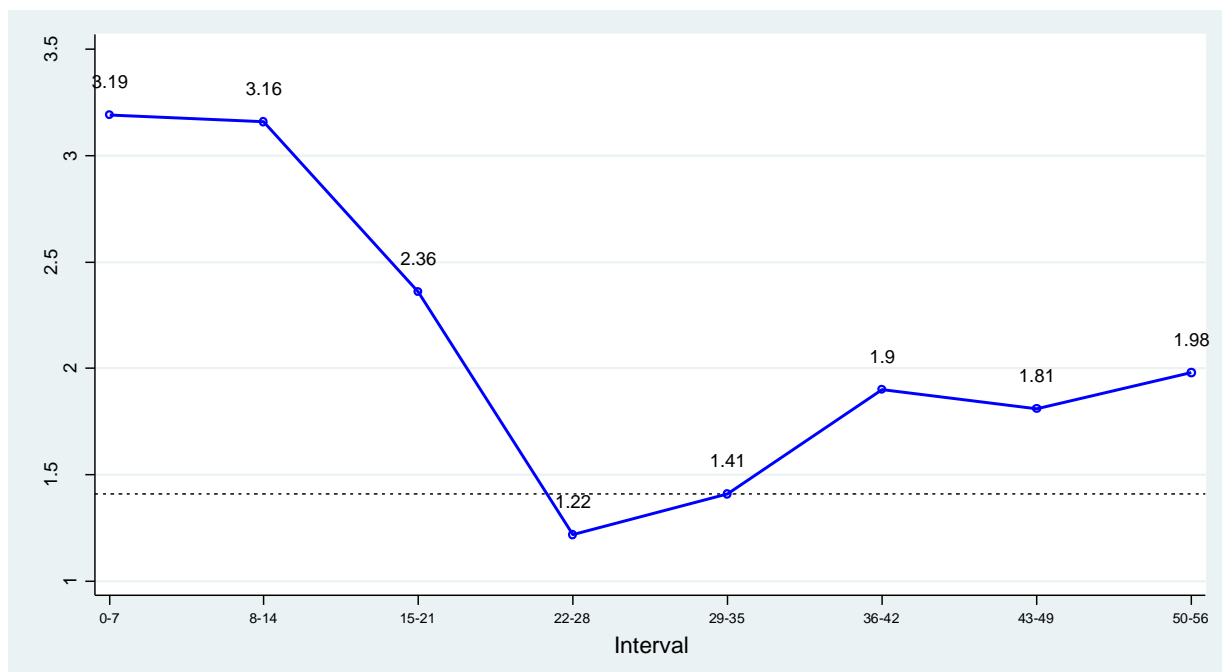
Note: IR values falling on or below the horizontal reference line are not statistically significant ($p > .05$).

The graph in Figure 27 helps clarify the risk of near-repeats based on increases in time of 7-day intervals and geographical distances in increments of 500 feet. Examining the first temporal bandwidth (blue line), we find evidence of an increased risk to nearby residences up to about 3 blocks (1,500 feet) during the first 7 days after an initial burglary. The risk is highest (111%) at a distance of up to 500 feet (IR = 2.11, p = .01) and declines at further distances—the risk is 23% at approximately 2 blocks (501 to 1,000 feet; IR = 1.23, p = .04) and 29% at 3 blocks (1,001 – 1,500 feet; IR = 1.29, p = .01). Apparently, there is no significant risk at a distance of about 4 blocks (1,501-2,000 feet; IR = 1.04, p = .41), though there is at a distance of 2,001 – 2,500 feet or about 5 blocks (IR = 1.35, p = .01).

The analysis also reveals an elevated risk of near-repeats across time at a distance of 1,001-1,500 feet. At this distance the risk was 29% during the first 7 days (IR = 1.29, p = .01), 22% during the second week (IR = 1.22, p = .02), and 17% during the third week (IR = 1.17, p = .05). Results for other combinations of time and distance show substantially less consistent patterns.

These findings suggest that prevention efforts for repeat burglaries should occur within the first couple of weeks of a source event, and that near-repeat prevention efforts should occur within the first three weeks and within a few blocks of a source burglary. However, we also note that the risk for near-repeats is greatest during the first 7 days and within a distance of about a block of a source event. Prevention efforts might be tailored accordingly.

Figure 27. Risk of near-repeat burglaries by 7-day intervals, North Region
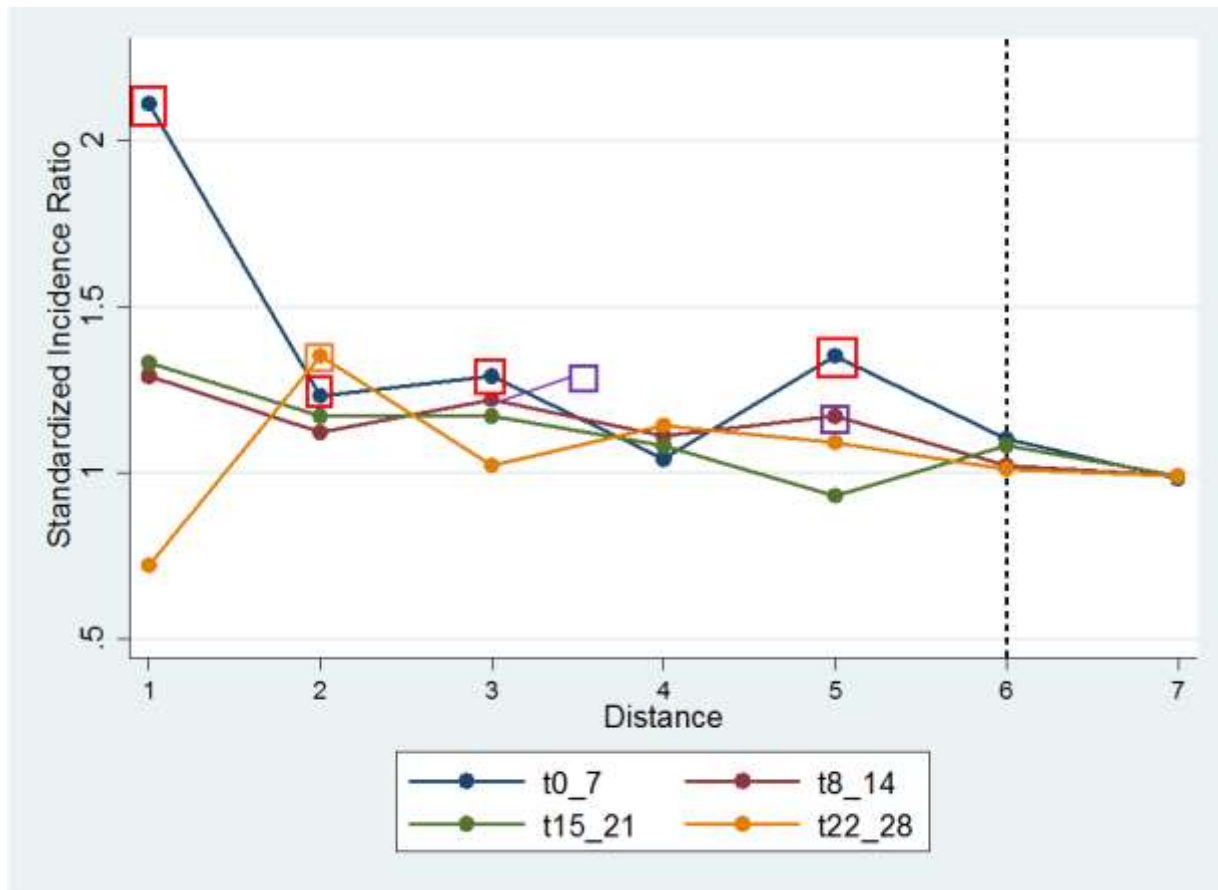
Notes: The distance values on the X axis represent 500 foot increments. Thus, the value 1 = a distance of 1-500 feet, 2 = 501 to 1,000 feet, etc., though 7 = 3,000 feet or more. The squares represent significance values of $p < .05$. Temporal bandwidths (horizontal lines) greater than 22-28 days are not displayed as there is no evidence of statistical significance at those bandwidths. The vertical reference line marks the distance at which there is no longer evidence of an increased risk of near-repeats.

Setting the temporal bandwidth to 14 days provides evidence of an increased risk of repeats up to 56 days (8 weeks) of an initial event (IR = 1.95, p = .02), though the risk is greatest (203%) during the first 14 days (IR = 3.03, p = .01), followed by the 15 to 28 day interval (IR = 1.88, p = .01), and the 29 to 42 day interval (IR = 1.61, p = .03). These results are largely

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congruent with those above using a 7-day bandwidth in that for both analyses the first two weeks represent the period of highest risk.

The pattern for near-repeats using a 14-day bandwidth also is similar to that when using a 7-day bandwidth. Specifically, within the first 14 days, there is a substantive and significant increased risk of near-repeats within a distance of 500 feet ($IR = 1.69$, $p = .01$), 501-1,000 feet ($IR = 1.18$, $p = .05$), and 1,001-1,500 feet ($IR = 1.28$, $p = .01$). The results also indicate that at a distance of 501-1,000 feet there is an increased risk of near-repeats for up to 28 days. More precisely, the risk is 18% during the 0-14 day interval ($IR = 1.18$, $p = .05$) and 24% at the 15-28 day interval ($IR = 1.24$, $p = .01$).

When we expand the temporal bandwidth to 21 days the results indicate the greatest risk (187%) of repeats is during the first 3 weeks of a source burglary ($IR = 2.87$, $p = .01$). The risk remains significantly elevated during the 22-42 day and the 43-63 day intervals as well, but it is lower compared to the 0-21 day interval ($IR = 1.56$, $p = .01$ and $IR = 1.82$, $p = .01$, respectively). Thus, using a 21-day bandwidth suggests the risk of repeat burglaries is elevated for a period of up to 9 weeks. This is similar to the risk observed when using a 14-day bandwidth (8 weeks).

Regarding near-repeats, the pattern continues to be similar to above, with the risk being greatest to nearby residences located within about a block (500 feet) and 21 days of a source burglary ($IR = 1.55$, $p = .01$). Within that 0-21 day interval, the risk remains significantly elevated up to a distance of 1,500 feet (about 3 blocks) though the magnitude of the risk is lower. Specifically, at 501-1,000 feet the risk is 18% ($IR = 1.18$, $p = .02$), and at 1,001-1,500 feet the risk is 24% ($IR - 1.24$, $p = .01$).

We also observe that at a distance of 501-1,000 feet, the risk during the first 21 days is 18% (IR = 1.18, p = .02), during the 22-42 day interval it is 16% (IR = 1.16, p = .03), and for the 43-63 day interval the risk is 18% (IR = 1.18, p = .01). Thus, using a 21 day bandwidth suggests the risk of near-repeat burglaries is elevated for a period of up to 9 weeks, but only at a distance of 501-1,000 feet of a source event.

Hyatt Park Study Area Findings

The results for Hyatt indicate an increase in the risk of repeat and near-repeat burglaries within 7 days of a source event. Specifically, the risk of burglaries at the same location up to 7 days after an initial event is 377% higher than if there were no repeat burglary pattern (IR = 4.77, p = .01). There is no increased risk during the 8-14 day interval (IR = 2.47, p = .20), but there is a large and significantly increased risk (633%) for repeats during the 15-20 day interval (IR = 7.33, p = .01) as well as the 22-28 day interval (IR = 5.50, p = .04). The next interval at which there is a significant elevated risk is 43-49 says or at the 7th week of a source burglary (IR = 5.42, p = 5.42). Regarding near-repeats, there is evidence of an increased risk to nearby residences within 501-1,000 feet of a source event for up to 7 days (IR = 1.64, p = .03).

Expanding the temporal bandwidth to 14 days, we continue to see evidence of an increased risk of burglaries at the same location within 14 days of a source event (IR = 4.01, p = .01), though the risk is greater (620%) during the 15-28 day interval (IR = 7.20, p = .01). No significant increased risk is observed for the 29-42 day interval (IR = .80, p = .66), though there is for the 42-56 day interval (IR = 3.99, p = .01). The results indicate no significant risk of near-repeat burglaries when using the 14-day bandwidth.

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Using a temporal bandwidth of 21 days indicates an increased risk of repeat burglaries for up to 21 days of a source event (IR = 3.48, p = .01). There also is an increased risk at the 43-63 day interval or 7th - 9th week (IR = 2.90, p = .03) but not for the 22-42 day interval or the 4th - 6th week (IR = 2.26, p = .07). The results also suggest an increased risk of near-repeats within 1,001-1,500 feet of a source burglary (IR = .126, p = .04).

The results of the Hyatt analysis are less consistent than those from the North Region, perhaps due to the smaller number of burglaries in Hyatt during the observation period (N = 222). That said, a reasonable conclusion is that there is a substantively important and statistically significant increased risk of burglaries at the same location within about a 21-day window of a source event. There also is some evidence, albeit weak, of a risk to nearby residences within 501-1,000 feet and 1,001-1,500 feet of a source event for up to 7 days, depending on the temporal bandwidth used. Though prevention efforts may impact near-repeats in Hyatt, the findings suggest that prevention efforts carried out within a week or so of a source burglary would likely have a substantially larger impact on repeat burglaries.

Analysis of Hyatt Park Study Area Burglary Reduction Project

Results from the above descriptive analyses and more sophisticated repeat and near-repeat statistical analyses were presented to CPD command staff as discussed earlier. Chief Santiago and other command staff members expressed interest in moving forward with a targeted burglary intervention in the Hyatt Park neighborhood (i.e., the Hyatt study area). The USC research partners conducted an extensive review of the burglary prevention literature to develop evidence-based ideas for the burglary initiative. Table 13 provides an overview of several of the

Table 13. Overview of example repeat burglary studies		
Location	Elements of intervention	Effectiveness

"Biting Back" **Huddersfield (England)**
 	
 (Anderson et al., 1995; Chenery et al., 1997)
	· Better effort to track <u>repeat</u> victimization
	 · Graded responses according to # of times victimized within last year
	   · *Bronze (1x):*
	     · Victim letter, UV marker pen, crime prevention advice
	     · Discount vouchers on security equipment
	     · Informants check, early check on known outlets
	     · Cocoon watch, rapid repairs
	   · *Silver (2x):*
	     · Visit from CPO
	     · Search warrant
	     · Installation of alarm
	     · Police watch visits 2x per week
	     · Security equipment loan
	   · *Gold (3x):*
	     · Visit from CPO
	     · Priority AFR
	     · Covert cameras, alarms
	     · Police watch visits daily
	     · Trackers
		· Domestic burglaries declined by 30%
		 · Theft from vehicles declined by 20%
		 · Reduction over time in the number of silver & gold responses, which suggests a decline in repeat burglaries
		 · No evidence of displacement
		 · 92% of <u>officers</u> believed the program was successful
		 · Increased public satisfaction in treatment area

Lightning Strikes Twice **(Beenleigh, Queensland)**
 	
 (Budz et al., 2001)
	· 3 tiered response
	   · *Stop Break Response (1x):*
	     · Security advice & materials
	   · *Hot Dot Response (2x):*
	     · More extensive prevention materials
	   · *Hot Spot Response (3x):*
	     · Home-security assessments, property marking
		· Repeat victims fell 16%
		 · Repeat incidents fell 15%
		 · >80% of victims reported police advice was helpful, although satisfaction did not increase
		 · No displacement to other areas detected
		 · However, overall burglary increased in treatment area, suggesting repeats may have displaced to other areas within treatment area.

Repeat Break and Enter **(Tee Tree Gully, Adelaide)** **(Henderson, 2002)**	· Security audits · Informal support · Referral to other agencies · Referral for property marking · Links to neighbors	· Repeats reduced, but overall burglaries increased relative to control area · Poor implementation of the project—only 32% of victims received advice · Only 4-8% of victims purchased alarms · No evidence of displacement
Hot Dots in Hot Spots **(Baltimore, Dallas, & San Diego)** **(Weisel et al., 1999)**	· Warning cards with security advice for victims and neighbors · Free property registration · Security checks, patrols · Written notification to apartment managers · Emphasis on better investigations · Security brochures	· No change in citizen perceptions of burglary, though they expressed more satisfaction · Official data revealed 5.2% declines in Baltimore, and 12% declines in San Diego

studies that examined repeat burglaries. The USC research partners, CPD crime analysts, and members of the North Region command staff (Captain Tim Holbrook was the main point of contact for the project) met on several occasions and developed an operational plan for the burglary project based on the review of the literature. This process was consistent with the grant's overall goal of moving toward an ILP philosophy by utilizing the TTCG (Tactical Tasking and Coordination Group). Meetings with Captain Holbrook and other North Region supervisors resulted in the determination that the intervention would take place for 15 weeks and would begin in April 2014. The operational plan was titled "Operation TAD (Tiered Awareness and Deterrence)" and the intervention steps are discussed next.

Operation TAD Intervention Process

Tier 1 of Operation TAD. Figure 28 presents the Operation TAD intervention process map. With respect to the first tier of response, the responding officer(s) to an initial or source burglary call is responsible for a number of tasks. First, the officer is required to complete an incident report consistent with what he/she would have done prior to any intervention. Second, the officer is required to conduct a "security survey" with the home owner/occupant if they agree. The survey allows officers to examine the residence and note any crime prevention steps the owner/occupant could take to prevent future burglaries (e.g., trim hedges, lock windows, install lighting, etc.). The recommendations contained on the survey and burglary prevention tip pamphlets were then given to the owner/occupant (Images of the four-page burglary prevention tip pamphlet are provided in Figure 29). The shift supervisor was responsible for ensuring that each of these tasks was completed during the initial burglary call. This step in the intervention was geared toward reducing the likelihood of the residence experiencing a repeat burglary.

Figure 28. Operation TAD intervention process map

Tier 1: Initial Burglary Response

```
                    ┌─────────────────────────────────────┐
                    │        Initial Home Burglary          │
                    │        Hyatt Park Catchment Area      │
                    └─────────────────────────────────────┘
```

Initial Responding Officer Duties:

- Complete incident report
- Conduct security survey
- Mention free Crime Prevention assessment
- Provide burglary prevention tip pamphlet to home owner
- **Shift supervisor ensures tasks are completed**
- *NOTE: These tasks are to be completed during the initial response to the burglary call*

Crime Prevention Officer Duties (within 24 Hours):

- Visit homes within one (1) block radius of the burglary for knock and talks
- Notify home owners that they are at increased risk of a burglary
- Provide home owners with burglary prevention door hangers (hang on door if no one answers)
- **Shift supervisor ensures tasks are completed**
- *NOTE: These tasks are to be completed within 24 hours of the initial burglary call*

Crime Analysis Unit Responsibilities:

- Email alert created to notify supervisors of burglary
- Security survey database entry (2x week)

Next Page for Tier 2: Repeat Burglary Response

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Figure 28 continued. Operation TAD intervention process map

Tier 2: Repeat Burglary Response

Repeat Burglary:
Home is Burglarized a Second Time

Initial Responding Officer Duties:

- Complete incident report
- Conduct 2nd security survey
- Provide burglary prevention tip pamphlet to home owner
- **Shift supervisor ensures tasks are completed**
- *NOTE: These tasks are to be completed during the initial response to the burglary call*

Crime Prevention Officer Duties (within 24 Hours):

- Visit homes within one (1) block radius of the burglary for knock and talks
- Notify home owners that they are at increased risk of a burglary
- Provide home owners with burglary prevention door hangers (hang on door if no one answers)
- **Shift supervisor ensures tasks are completed**
- *NOTE: These tasks are to be completed within 24 hours of the repeat burglary call*

Crime Analysis Unit Responsibilities:

- Email alert notifies supervisors
- Email supervisor to inform them that the burglary was a repeat location
- Update security survey database regarding measures taken by homeowner since first burglary
- For the specific repeat location:
    - o Assess whether measures were taken by home owner as a result of security survey to prevent burglary
    - o If measures were taken, they qualify to have a free alarm system installed for a specified time
    - o Set up a time for alarm installation if they desire one

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Figure 29. Burglary prevention tip pamphlet

Page 1:

Burglary Victims

City of Columbia Police Department

As a burglary victim, you are suffering from the possible loss of your property. We as a Department are here to help prevent future burdens such as these. This pamphlet provides you with some possible techniques to help lower your chances of being burglarized again. Please remember, following all of these tips and suggestions listed inside this pamphlet will not foolproof your home. They will, however, help strengthen your home against future intrusions. The Columbia Police Department would like to assure you of our efforts to help you and other citizens feel safe in our great city.

Figure 29 continued. Burglary prevention tip pamphlet

Pages 2 and 3:

Securing Your Home

Does your home look occupied?

One of the most important tips is to make your home look occupied. Burglars often look for homes that look to be an easy target. You can help your home's appearance by complying with these three ideas:

- Make sure your property is well landscaped and maintained
- Make sure your home is adequately lit even when you are away
- Do not allow your mail to accumulate in your box

Would your home provide a challenge to a burglar?

Burglars are working with a short time window. One of the key ideas to preventing a burglary is to make your home look like a challenge to a would be burglar. Keep these ideas in mind:

1. If you were locked out of your home, how would you get in? Now, consider a way to make that entry more difficult.
2. Do you always lock your door? Make sure that locking all entry points is a priority.
3. Do you believe your door and frame would withstand a hard kick? If not, consider reinforcing the frame and adding a deadbolt.
4. Are your windows locked and is the view into them obstructed by curtains or blinds? Make sure your windows are locked and the view from the outside in is blocked.
5. If you were to walk out at night, would you be able to see all corners of your perimeter? If not, make sure you can always see your perimeter-burglars lurk in areas where visibility is obstructed.
6. Do you know your neighbors? Work together to keep an eye on one another's property.

Doors and Windows

Suggestions for Doors and Frames

Doors should be solid core, meaning solid wood (1 ¾" thick) or metal clad. All exterior doors need to have a double locking component. Double Cylinder locks with at least a 1 inch throw are recommended. Handles containing a dead latch plunger are also recommended. Frames should be properly checked and maintained and should be secured to the home with 3 inch screws. Hinges must be maintained and checked.

Suggestions for Windows

Shrubbery should be limited or trimmed around windows to prevent hiding spots for burglars. Windows should have some type of auxiliary locking device.

Additional Tips

- Make sure your exterior is properly lit (motion lights bring light to those who don't want to be seen)
- Timed lighting in the interior of the home, makes the residence look occupied even when you're away (the key is to make your home appear occupied at all times)
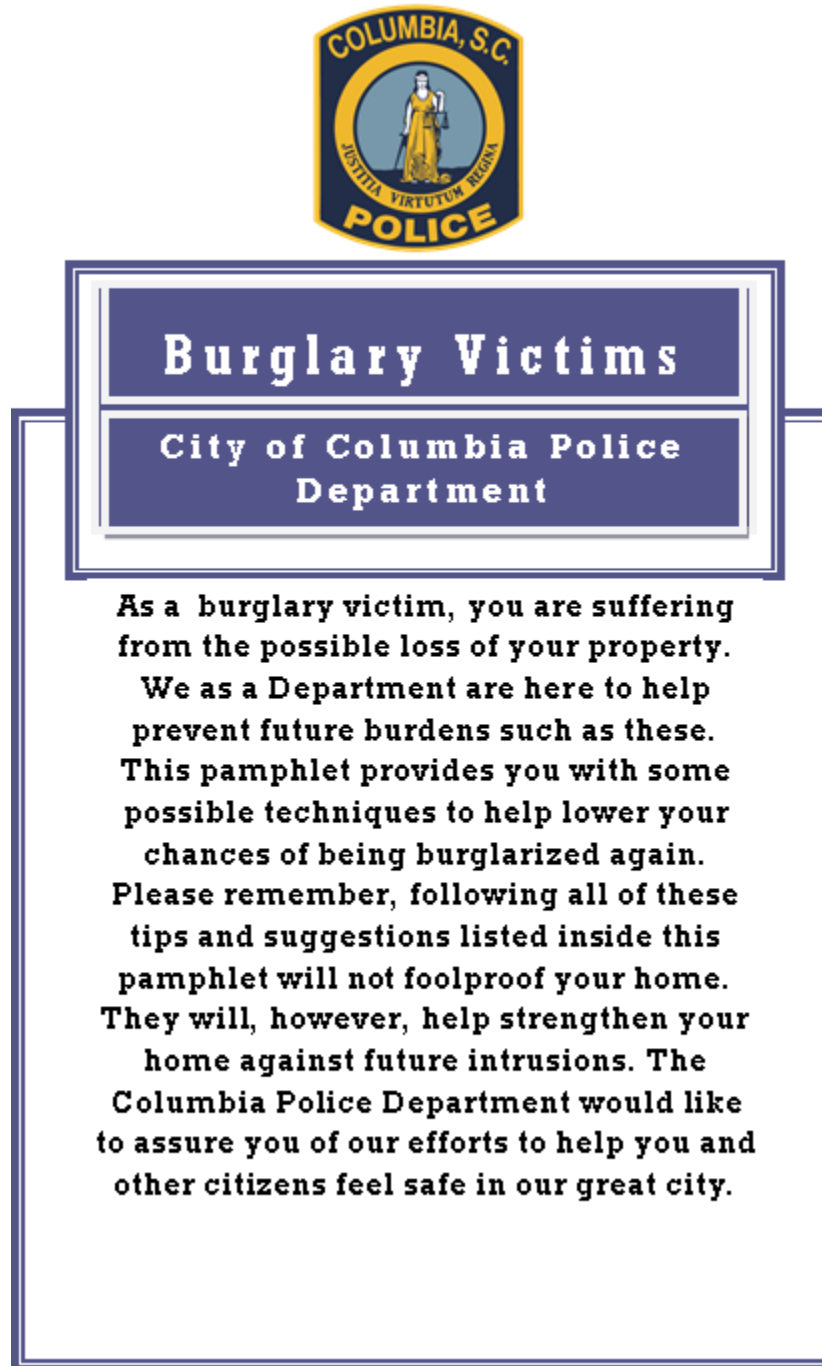- Make sure all tools and garden equipment are locked away in the home or in a locked shed; these items may be stolen or used to break into your residence.
- Do not put packaging of valuables (e.g. TV, Computer boxes) on your curb, cut them and place them in the trash
- Alarms may deter criminals from entering your residence, and they might also limit the time a burglar has in your home
- Dogs can be used to help scare away would-be burglars away
- Record and document serial numbers of all valuables or place a unique number (not a social security number) on them for recovery purposes
- REPORT ALL SUSPICIOUS BEHAVIOR!!!
- Contact Crime Prevention for a free Security Survey of your home (contact information on the back)
- Contact the Telephone Response Unit for property checks when on extended leaves (contact on the back)

Figure 29 continued. Burglary prevention tip pamphlet

Page 4:

CONTACT INFORMATION

COLUMBIA POLICE DEPARTMENT (Telephone Response Unit)	(803)545-3500
Crime Stoppers (REPORT ANY SUSPICIOUS ACTIVITY)	1-888-559-TIPS
Crime Prevention (FREE SECURITY ASSESMENT)	803-545-3555

To monitor crimes in your neighborhood,
please visit www.raidsonline.com

PLEASE REMEMBER IF YOU ARE A VICTIM OF A BURGLARY:

Do not enter your home

Notify the police

To preserve evidence, do not touch or clean anything until the police
have inspected the property.

The crime analysts were responsible for emailing North Region supervisors about the source burglary. Additionally, they were responsible for entering the data from the security surveys into a single database. Within 24 hours of the initial residential burglary, the shift supervisor was responsible for instructing members of the crime prevention team to conduct a series of tasks aimed at reducing the likelihood of near-repeat burglaries in the surrounding neighborhood. Consistent with the statistical analyses presented earlier, we pinpointed the 500 ft. radius surrounding a source burglary as the area at highest risk for experiencing a near-repeat burglary. This translated roughly into a one (1) block radius surrounding the initial burglary location. Crime prevention officers were responsible for visiting the homes contained in this one block radius to perform "knock and talks." During these interactions the officers notified residents that a burglary had occurred in close proximity to their home and that analysis of crime data reveals that they are at increased risk of being burglarized over the next several weeks. Importantly, the officers also provided the home owner/occupant with a burglary prevention door hanger (the officers hung this on the door if no one answered). The officers wrote the dates that the residence would be at the highest risk for a burglary on the door hangers (i.e., 2 weeks from the date of the source burglary). The burglary prevention door hanger is presented in Figure 30. Again, shift supervisors were responsible for ensuring that these steps were completed. It is important to note that the initial intervention plan called for crime prevention officers to conduct the "knock and talks" with door hangers. However, staffing limitations prevented this from occurring. Fortunately, Captain Holbrook was able to quickly devise an alternative strategy. Several officers on light duty within North Region were delegated this responsibility. This resulted in the successful implementation of a vital step of the burglary intervention process.

Figure 30. Burglary prevention door hanger

ATTENTION!

There has recently been a burglary in your area. Research shows that there is an increased risk of additional burglaries occurring within a short time frame and a short distance of a first burglary. This means that until
_____ – _____ – _____
your home is at an increased risk of being burglarized.

Please stay alert and consider the tips provided on the back of this hanger. If you would like one of our officers to conduct a security assessment of your home please contact our
Crime Prevention Unit
803–545–3555
Also, please report any suspicious activity to
Columbia Police Department
803–545–3500
or
Crime Stoppers
1–888–559–TIPS

BURGLARY PREVENTION TIPS:

- Lock all outside doors and windows before you leave… even if it's just for a short time.
- Leave lights on when you go out.
- Consider installing motion sensitive exterior lighting.
- Trim trees and hedges away from windows and doors.
- When you're away for a longer period of time, stop mail, newspapers, and other deliveries or have a neighbor collect them for you.
- Consider installing an alarm system.
- Install deadbolts on all exterior doors.
- Mark property through engraving with an identification code—such as your driver's license number.
- Consider participating in a neighborhood watch group.

IF YOU ARE THE VICTIM OF A BURGLARY:

- Do not enter your home.
- Notify the police.
- To preserve evidence, do not touch or clean anything until the police have inspected the property.

Tier 2 of Operation TAD. Tier 2 of Operation TAD consisted of a series of steps to be taken in the event of a repeat burglary (i.e., a home is burglarized a second time). As seen in Figure 28, the responding officers had several responsibilities that are consistent with the tier 1 response. Furthermore, the officers on light duty who were assigned responsibility for the door hanging knock and talks also followed the same protocol as the tier 1 response. The key difference in the tier 2 response to repeat burglaries revolved around the responsibilities of the crime analysis unit. Specifically, the crime analyst was in charge of emailing the North Region supervisor within 24 hours of a burglary to inform them that the location was in the study target area and that it was a repeat burglary. Next, the crime analyst was responsible for updating the security survey database with the new survey completed by the responding officer at the location of the repeat burglary. The analyst compared the initial and repeat security surveys to determine whether the home owner/occupant heeded any of the advice. In other words, the analyst determined whether the owner/occupant made any appropriate changes to their home or property consistent with the security survey recommendations to prevent a repeat burglary. If any changes were made by the owner/occupant the residence would qualify to have a free alarm system installed for the next several weeks. Alarms were purchased by CPD for this purpose and featured door and window censors. If the owner/occupant agreed to have the alarm installed, CPD was to arrange a time for the installation. This step in the tiered burglary prevention intervention was aimed at preventing further repeat burglary attempts. While there were several repeat burglaries experienced in the Hyatt study area during the intervention (discussed later), none of the owners/occupants wished to have an alarm installed. The most common reason for declining the alarm was that the owner/occupant was moving to a new address.

Quality control. A number of steps were taken to ensure the process of Operation TAD was followed as planned. Most importantly, training of North Region officers was undertaken by shift supervisors and commanders. Captain Holbrook and his staff wished to maintain control of the intervention training and indicated that no USC research partner assistance was required. During these trainings the officers were given a description of Operation TAD and the purpose of the intervention. They were informed about the Hyatt study area (i.e., the boundaries of the target area) and that the intervention steps would only take place in this zone. Additionally, the trainings notified the officers how each step in Operation TAD was to be completed.

A CPD crime analyst (Mr. Marchbanks) also conducted weekly (sometimes bi-weekly) checks with Captain Holbrook and other North Region supervisors to ensure that the process was being followed correctly. For example, he inquired about the security survey and door hanger completion. Furthermore, members of the USC research team met with North Region supervisors and the crime analyst on several occasions during the intervention period to ensure that the process was being followed faithfully. Captain Holbrook and his officers also presented results of the intervention to the USC research team when Operation TAD was about halfway through the study period. This presentation conveyed the region's commitment to the intervention and honest excitement about the process. Overall, few problems were encountered during the intervention. In short, all indicators available to the USC research team suggest that the steps of Operation TAD were followed as planned.

Operation TAD Results

CPD implemented its Operation TAD burglary reduction project on April 20, 2014. However, the first response to a burglary did not occur until May 20, 2014. Therefore, we use the

latter date as the intervention start point. The purpose of the analysis in this section is to determine whether there was a statistically significant reduction in the number of burglaries following the intervention. If a significant reduction is observed, the result would be consistent with a conclusion that Operation TAD reduced – or helped reduce – the incidence of burglaries in the Hyatt study area. We caution, however, that concluding Operation TAD "caused" a reduction in burglaries would be premature and requires further study. This is especially the case because of the short post-intervention follow-up period of only 15 weeks and the small number of burglaries that occurred in the Hyatt study area after May 20 (n = 18).

To test whether or not Operation TAD is associated with a reduction in burglaries, we estimate an interrupted time series model. This model is one of the strongest quasi-experimental designs in terms of making valid conclusions regarding the effect of an intervention (Campbell & Stanley, 1966), though its design can be strengthened by including one or more "control" series. For example, if a neighboring (control) area that did not receive the intervention also exhibited a significant decrease in the number of burglaries, it is difficult to make the case that any observed reduction in burglaries in the study area was due to the intervention. If the trends in burglaries are different in the two areas, confidence that the intervention had an impact is increased (McDowall, Loftin, & Wiersema, 1996). Therefore, we also conduct interrupted time series analyses in two control areas – one that is adjacent to the Hyatt study area (see the map in Figure 7) as well as for the North Region overall.[10] Technical details regarding the regression method is provided later.

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[10] The control area experienced 12 burglaries and the North Region experienced 100 burglaries post-intervention.

Prior to presenting the results of the interrupted time series analyses, we examine burglary trends for each series in the following graphs (Figure 31). Although we can see some up and down trends in the series for Hyatt and the control area, because of the relatively small numbers of burglaries per week in each area, the large fluctuations make it difficult to discern

Figure 31. Number of burglaries per week pre-post intervention

Hyatt
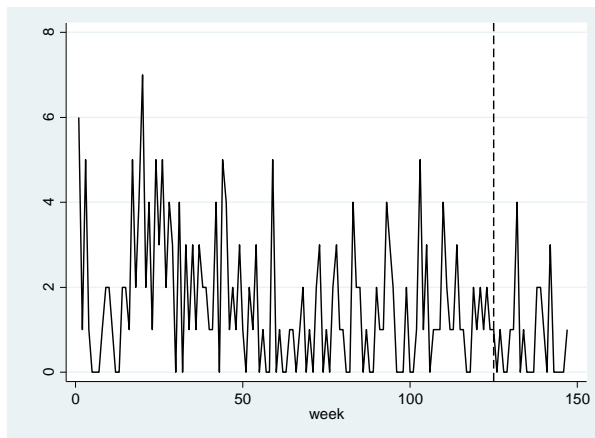
Control Area
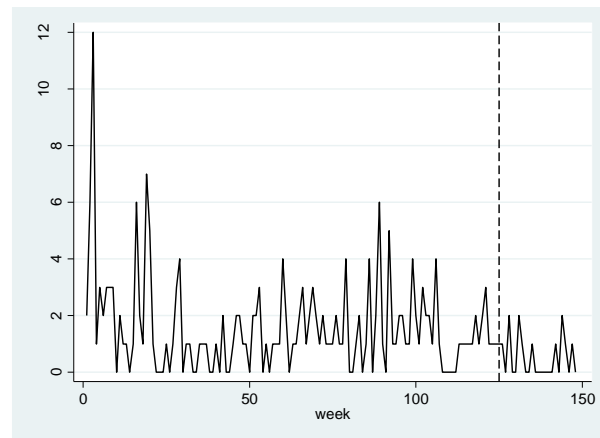
North Region
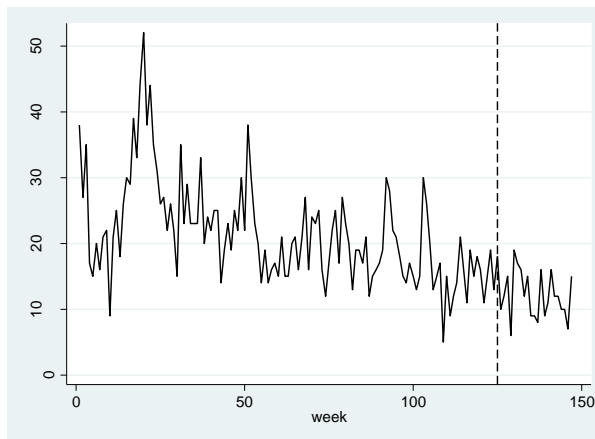
whether there was a substantial decline in burglaries post-intervention (represented by the dashed vertical lines). Because of the larger number of burglaries per week in the North Region, we observe a clearer pattern that shows a generally declining trend in the number of burglaries over most of the study period. We also see that there appears to be somewhat of a reduction in the number of burglaries post-intervention. An important question, however, is whether or not the declining trend in the North Region could account for any declines in burglaries in the Hyatt study area. The interrupted time series analysis presented below will help answer this question.

Interrupted time series analysis

To assess the impact of the intervention, we estimate a generalized liner regression (GLM) model with log-link and family Poisson, which is appropriate for the analysis of counts such as the *number* of crimes versus the crime *rate*. Critical to the analysis is the use of Newey-West standard errors (Newey & West, 1987) also known as heteroscedastic and autocorrelation-consistent (HAC) standard errors that correct for overdispersion (for technical details see Cameron & Trivedi, 2013; Hardin, 1997; Hardin & Hilbe, 2012). Another important component of the modeling is the specification of a temporal lag. Testing lags of lengths of 1 to 6 weeks, we found that a lag of 1 or "first difference" produced the most conservative tests of significance for the effect of the intervention. Therefore, we use a temporal lag of 1 week for the analysis. We also include controls for year that compare the expected number of burglaries in 2013 and 2014, respectively, versus the base year of 2012. The results are displayed in Table 14 (standard errors not presented).

The outcome or dependent variable for the analysis is the number of burglaries in each of the three areas (Hyatt study area, the control area, and the North Region). The key independent

variable in Table 14 is the intervention date (Intervention). It is a dummy variable coded 0 prior

to the intervention and 1 thereafter. The year variables are coded 1 if year = 2013 and 0 if year =

2012 (the reference or base year), and 1 if year = 2014 and 0 if year = 2012, respectively. The

regression coefficients (eβ) are exponentiated, thus values less than 1 represent negative or

inverse relationships between the independent variables and the outcome and values greater than

1 represent positive relationships. The p-values represent statistical significance with values ≤

.05 indicating that the relationships between the independent variables and the number of

burglaries are unlikely to be due to chance. The values under the column $\Delta E(y|x)$ represent

discrete or partial changes in the expected number of burglaries as an independent variable

changes from its minimum to its maximum value (e.g., for the variable Intervention, a change

Table 14. Interrupted time series models assessing the relationship between the intervention and number of burglaries

Area / Variable	eβ	p-value	$\Delta E(y|x)$	p-value
Hyatt Study Area				
Intervention	.536	.048	-.745	.011
2012 (base year)	----	----	----	----
2013	.634	.001	-.960	.001
2014	.633	.016	-.750	.015
Constant	2.212	.000	----	----
Control Area				
Intervention	.492	.035	-.770	.007
2012 (base year)	----	----	----	----
2013	.956	.840	-.071	.842
2014	.636	.138	-.579	.149
Constant	1.731	.006	----	----
North Region				
Intervention	.840	.028	3.260	.019
2012 (base year)	----	----	----	----
2013	.725	.000	-7.068	.000
2014	.558	.000	-11.355	.000
Constant	26.346	.000	----	----

Notes: eβ = exponentiated regression coefficient; $\Delta E(y|x)$ = the discrete change in the expected count as an independent variable changes from 0 to 1, controlling for the other variables in the model.

from 0 or the pre-intervention period, to 1 or the post-intervention period). Discrete or partial

changes and marginal effects are commonly used by econometricians and are frequently

preferred in place of regression coefficients for nonlinear models such as the Poisson (Hilbe,

2014). Accordingly, we will interpret these estimates rather than the regression coefficients. We

do so in the context of estimating predictive margins, which we examine graphically to display

the effect of the intervention date in Hyatt and the two control areas (Figure 32).[11]

Figure 32. Predictive margins with 95% confidence intervals

Hyatt Study Area

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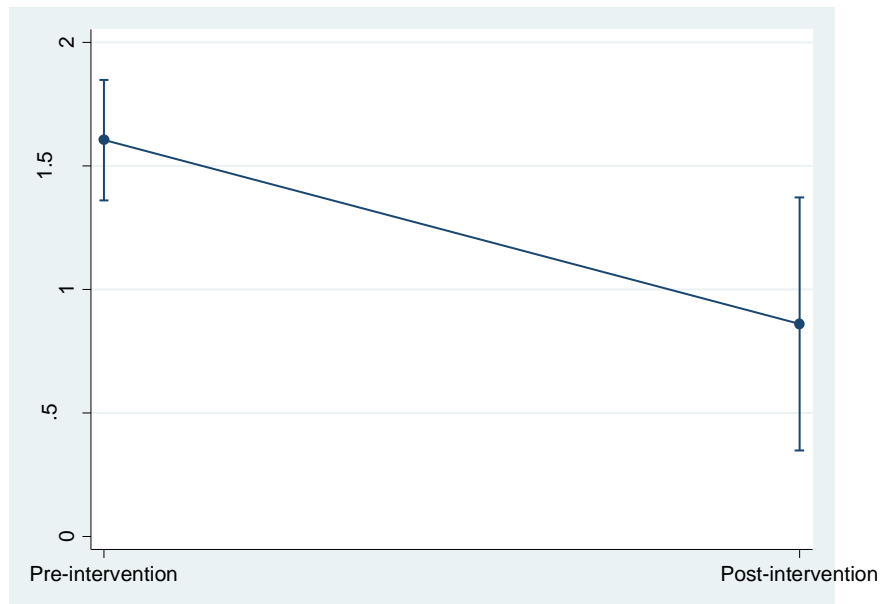
[11] Stata version 13 was used to estimate the regression models, discrete changes in the expected counts and predictive margins. The following commands were used for the analysis:
    tsset week
    glm burglaries i.intervention i.year, family(poisson) link(log) vce(hac nwest 1) nolog vsquish
    margins, dydx(*)
    margins, at(intervention = (0 1)) vsquish
    marginsplot

Figure 32 continued. Predictive margins with 95% confidence intervals

Control Area
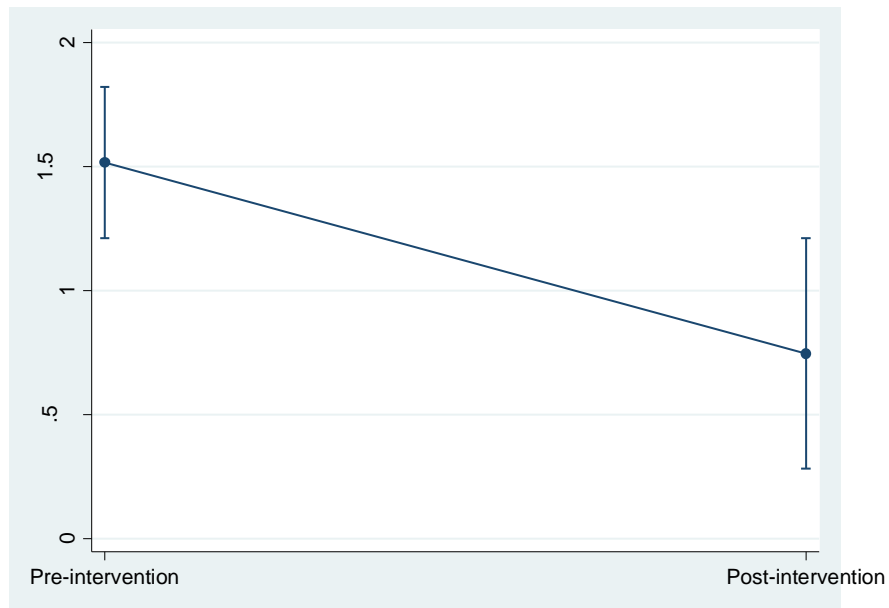
North Region
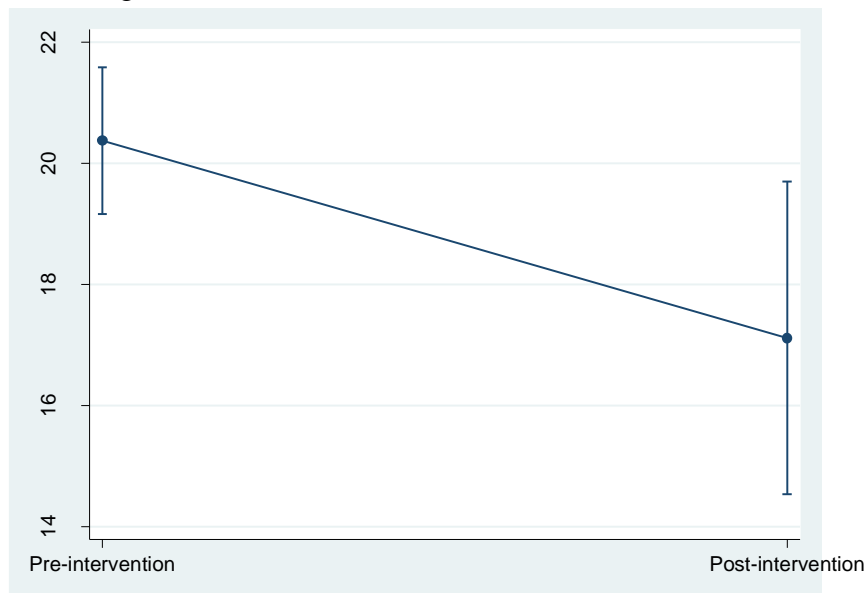
As shown in the graph for Hyatt, the predicted average number of burglaries prior to the intervention is 1.605 per week and .860 burglaries per week on average following the intervention. The difference is a reduction of an average of .745 burglaries per week. As shown in Table 14, this difference is statistically significant at the p = .011 level. For the control area, the predicted average number of burglaries pre-intervention and post-intervention is 1.516 and .747, respectively. The difference of .770 fewer burglaries per week on average also is statistically significant (p = .007). Regarding the North Region overall, the average predicted number of burglaries prior to the intervention was 20.375 and 17.115 following the intervention. The difference represents an average of 3.260 fewer burglaries per week following the intervention in Hyatt. This difference too is statistically significant (p = .019).

That the reduction in the number of burglaries in the Hyatt study area is statistically significant is consistent with a conclusion that Operation TAD was responsible for the decline. However, given that the intervention date was also associated with significant reductions in the number of burglaries in the control area and the North Region overall casts some doubt that Operation TAD deterred burglaries. It is more likely that the declines observed in all three areas was due to an overall declining trend in burglaries in the North Region over the study period as evidenced by the trend graph and the fact that the year dummy variables are statistically significant in the regression model for the North Region. This does not mean that the intervention did not reduce burglaries. As noted earlier, the post-intervention observation period was quite short and there were very few burglaries during this time, no doubt making the ability to statistically detect a larger effect improbable. Given this uncertainty, we encourage CPD to continue to study the impacts of Operation TAD in the Hyatt area as well as implement the

program in other areas of Columbia. Finally, we would be remiss not to mention that several

incidental benefits were apparent during the intervention period. For example, line officers and

supervisors participating in the study found that local residents were highly appreciative of the

efforts of CPD to reduce burglaries in their neighborhoods. The effort also increased the number

of positive interactions officers had with local residents. Therefore, crime prevention efforts such

as Operation TAD not only have the potential to deter or reduce crime, but also appear to lead to

improved police-community relations. This in itself is an important benefit given the current

climate between disenfranchised minority communities and law enforcement agencies across the

country.

Summary of Operation TAD Results

Descriptive statistics showed that there were 1,056 reported burglaries or attempts in the

North Region that occurred between January 1, 2012 and October 31, 2014 (222 of which

occurred in the Hyatt Park study area). Analysis also revealed 16.1% of the burglary locations in

the North Region involved repeats, while the figure for the Hyatt study area was slightly higher

(17.0%).

Analysis of the timing of repeat burglaries found that the risk of a repeat tended to be

greatest within the first week of an initial or source burglary. Although the risk tended to decline

thereafter, the risk of a repeat remained high for several weeks. The implication is that burglary

reduction efforts should target initial or source burglary locations as soon as possible to help

prevent subsequent victimizations. Also, given the differences in the temporal patterns of repeats

observed in the Hyatt study area and the North Region overall, intervention efforts implemented

in different geographic areas (and/or different time periods) should check for unique patterns of repeats and tailor intervention efforts accordingly.

Visual inspection of burglary locations in the North Region suggested areas with apparent higher numbers of burglaries relative to other areas throughout the region (i.e., 'hotspots'). Although we did not employ formal tests of statistical significance for hotspot detection, the kernel density analyses do suggest the presence of high burglary incidence areas within the North Region and the Hyatt study area. Some of these areas also contained substantial numbers of repeat burglaries. Geographic areas with high numbers of burglaries and/or repeat burglaries should be considered for burglary reduction efforts. Of course, there were some high-repeat addresses outside of the high density areas that also could be targeted for prevention efforts. An important caveat is that some of the hotspots (and some locations outside of the hotspots) contained seemingly high-repeat address locations. Upon further inspection, however, it was determined that the addresses used to report these burglaries actually represented events that were distributed throughout apartment complexes or low income housing subdivisions (i.e., Bethel Bishop Chappelle Memorial Apartments, Gable Oaks Apartments, and Latimer Manor Apartments). That the actual address locations were not available may have impacted the kernel density analysis and almost certainly would negatively impact methods of hotspot detection that utilize statistical tests of significance. We recommend, therefore, that CPD make an effort to have officers report specific address locations for burglaries occurring within these and other similar areas. This was not an issue for the analysis in Hyatt, as all the high-repeat locations occurred at single-family home residences.

The regression analysis found substantive and statistically significant reductions in in the Hyatt study area following the implementation of Operation TAD. We noted that although this reduction is consistent with a conclusion that the intervention could have been responsible for the decline, we also found substantive and statistically significant reductions in areas not subject to the intervention using the same implementation date variable. This suggests it is likely that some other factor or factors unrelated to the intervention led to declines in burglaries in the Hyatt and control areas as well as the North Region overall. We noted as well that this does not mean that the intervention did not reduce burglaries (or did not in the long run). This is because the post-intervention observation period was short and there were few burglaries during this time. Time series methods typically require substantially longer post-intervention follow up periods and we encourage the continued implementation and operation of burglary and other crime-reduction strategies along with rigorous evaluations of them. Finally, although not part of a formal evaluation, the perception of officers and supervisors involved in Operation TAD was that local residents in the Hyatt study area were appreciative of the efforts of CPD to reduce burglaries. The effort also apparently led to more positive police-citizen interactions, which could potentially lead to improved police-community relations.

Background

CPD and the Department of Criminology and Criminal Justice at USC began working together on issues related to gang activity in 2007. This partnership developed in response to growing pressure from the community to address increasing levels of gang violence. In the past there had been little coordination across government agencies, schools, non-profit organizations, and other community organizations in efforts to address gang activity. Accordingly, the City of Columbia partnered with faculty from USC to conduct a gang assessment that was modeled after the Office of Juvenile Justice and Delinquency Prevention's comprehensive gang model (Rojek, Smith, & Rogers, 2008). The goal of the project was to establish a better understanding of the extent and nature of the city's gang problem.

At the time, gang intelligence was very rudimentary and CPD had limited resources available for its Gang Unit. The department had only two investigators dedicated to monitoring gangs in the city and one of these individuals was responsible for a considerable amount of time working on a federal task force. As a result, the department struggled to develop gang intelligence due to limited field contacts in the community. Investigators had identified approximately 200 individuals as gang members at this point in time, but believed there were at least twice as many undocumented gang members in Columbia (Rojek et al., 2008). Furthermore, the system for maintaining gang intelligence was rudimentary—all gang intelligence data was recorded on paper files and a Microsoft Excel spreadsheet. These

limitations diminished the agency's capacity to collect and analyze gang intelligence data at the time of the assessment.

As of 2014, the department's gang intelligence efforts had improved. There were two officers and one investigator dedicated to the Gang Unit (these officers were fully dedicated to the unit and were not splitting time with other duties). Additionally, CPD's Gang Unit has now partnered with the Richland County Sheriff's Department Gang Unit to allow for interagency coordination and policing of gang-related crimes. CPD's unit also improved its documentation of intelligence related to gang members and their activities—including identification of sub-clique and larger affiliations (i.e. Crip, Blood, Folk). However, the unit's analytic capabilities remained limited. Evidence of each individual's gang affiliation (meeting classification criteria, known associates, monikers, tattoos, etc.) was documented on separate Microsoft PowerPoint slides. Accordingly, around the time the Columbia SPI started, the Gang Unit was trying to convince command staff of the need to purchase either a stand-alone gang database software program or a gang intelligence module from their RMS vendor. The lack of resources coupled with a highly publicized gang-related shooting discussed earlier convinced CPD to leverage the SPI grant in an effort to begin developing a more practical and analyzable gang intelligence database. Specifically, the USC research team pinpointed social network analysis (SNA) as a potentially productive strategy for improving the department's gang intelligence and, ultimately, its capacity to respond to gang-related violence.

Method

SNA is the study of relationships among entities (Wasserman & Faust, 1994) and has been used for decades to study relationships among friends (Laumann, 1973; Wiseman, 1986),

organizational workgroups (Lincoln & Miller, 1979; Ibarra, 1995), scientists (Newman, 2004), and acquaintances (Wellman, 1996). Recently, researchers have used SNA to explore criminal networks (Xu & Chen, 2005), terrorist cells (Koschade, 2006; Victroff, 2005), street gangs (McGloin, 2005a, 2005b, 2007), and organized crime syndicates (Finckenauer and Waring, 1998). McGloin (2005b), for example, used thirty-two interviews with known gang members to gather information about over 700 gang members and the relationships among them as part of the Safer Cities Initiative in Newark, New Jersey. Analyses revealed that the gangs were loosely affiliated with numerous cliques and cutpoints (i.e., key-positioned individuals who provide linkages between cliques). In a separate study, Papachristos, Braga, and Hureau (2012) used SNA to predict the risk of gunshot injury among a network of 763 individuals residing in Boston's Cape Verdean community. Police practitioners have also started using SNA to aid with investigations. For example, The Richmond (VA) Police Department began using SNA in January 2008, and since then crime analysts have used it in a variety of cases including aggravated assaults and convenience store robberies (Johnson et al., 2013). Indeed, SNA is becoming a powerful tool for law enforcement.

Two methodological decisions must be made prior to using SNA. First, *actors* to be included in the network have to be defined. In the case of the Columbia SPI, SNA was used to provide a better understanding of gangs, subgroups, and the relationships among validated gang members and their known associates. Thus, *actors* were defined as either (a) validated gang members or (b) individuals whom gang investigators suspected were involved with a gang (e.g., they frequently associate with validated gang members). After defining the actors, the second decision pertains to how *ties* between the actors should be measured. In the present case, *ties*

were defined as co-arrests or joint field interviews. That is, a tie was established between two individuals if they were arrested together or field interviewed at the same time and location. In a separate analysis, *actors* were defined as gang subgroups and their members, while *ties* were defined as membership in said subgroups. This analysis proved useful for determining the extent to which different cliques affiliated with one another.

After making these decisions, the resulting network can reveal clues about who the well-positioned figures are within gangs or gang subgroups. Those with higher *degree centrality* scores, for example, may be high-ranking or highly active individuals within their gang. Degree centrality simply reflects the number of ties an actor has with other members or associates. Another measure of well-connectedness within a network is *eigenvector centrality,* which also counts the number of ties an individual has, but weighs each tie according to the associates' centrality. In other words, the measure accounts for the number of ties an individual has but places more weight on the ties that have more associates themselves (i.e., greater centrality is given to a person who is connected with individuals who are also well connected). Both measures of centrality were employed in the present study in order to determine who in the network is the most well-connected. In addition to centrality, SNA can be used to reveal who the most "well-positioned" individuals in the network are. Thus, while a certain individual may not appear to be a central figure, he/she may represent a "cutpoint" within the network—meaning he/she provides an avenue for communication to flow between otherwise disconnected cliques/subgroups of individuals.

Starting with a list of 184 validated gang members, the USC research partners began constructing the network. The Gang Unit had compiled a computer folder which contained

PowerPoint files for each of the 184 validated gang members, as well as roughly 200 more individuals whom the unit believed were gang-affiliated. Included on these files were the names of other "associates" with whom the gang member (or suspected gang associate) had been arrested or field interviewed. The network was constructed using IBM i2 Analyst's Notebook (version 8.9).

Results

The resulting network contained 823 individuals (639 of whom are not validated gang members) and 1451 ties among them (see Figure 33). Included in the network are validated members of cliques claiming Peoples Nation or Folk Nation affiliation. A number of noteworthy findings emerged. As Figure 33 shows, the network is fairly complex with several tightly connected clusters. At the same time, a number of cutpoints exist which connect large portions of the network together. For example, Figure 34 provides a zoomed-in view of the network to highlight a key cutpoint. The figure depicts an individual who is a validated member of Rollin' 90s—a subgroup of the Crips. This person is tied to 14 individuals who claim allegiance to the Bloods (7 of whom are validated). This type of information is important from a law enforcement standpoint because it could aid investigations centered on inter-gang criminal enterprises or possible avenues of violent retaliation between gangs. Knowledge of such connections could also be helpful when investigators search for informants or when they are attempting to confirm information attained during interviews or interrogations.

Figure 33. The gang member and gang associate network
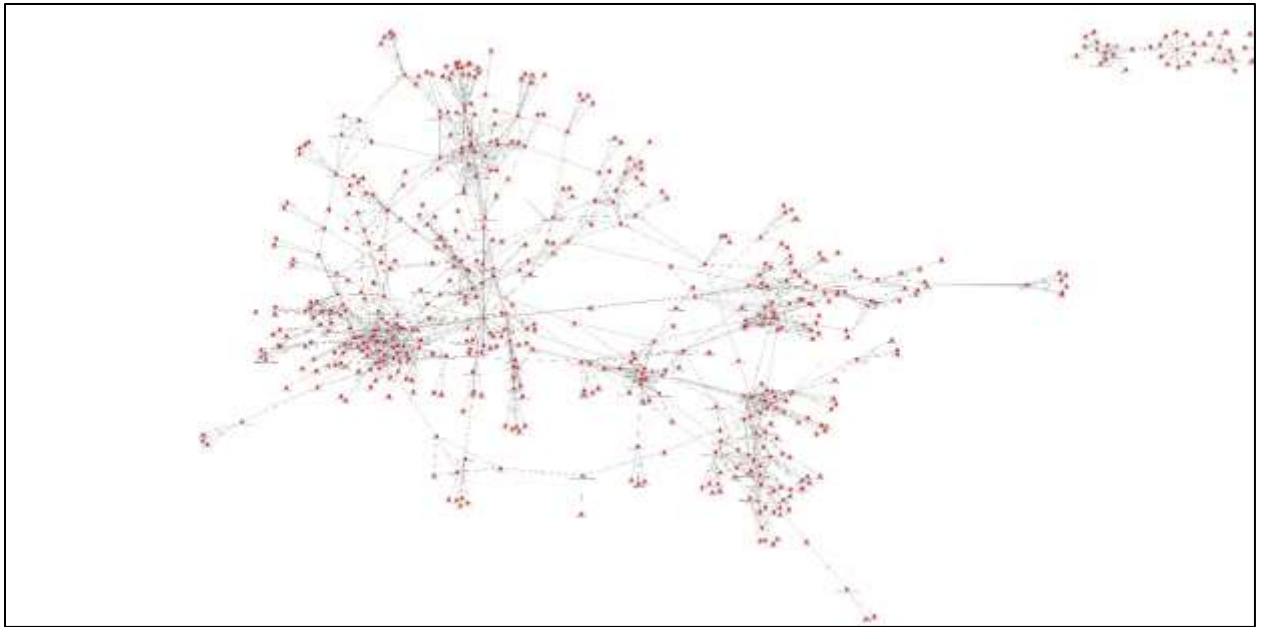
Figure 34. Example of a key cutpoint
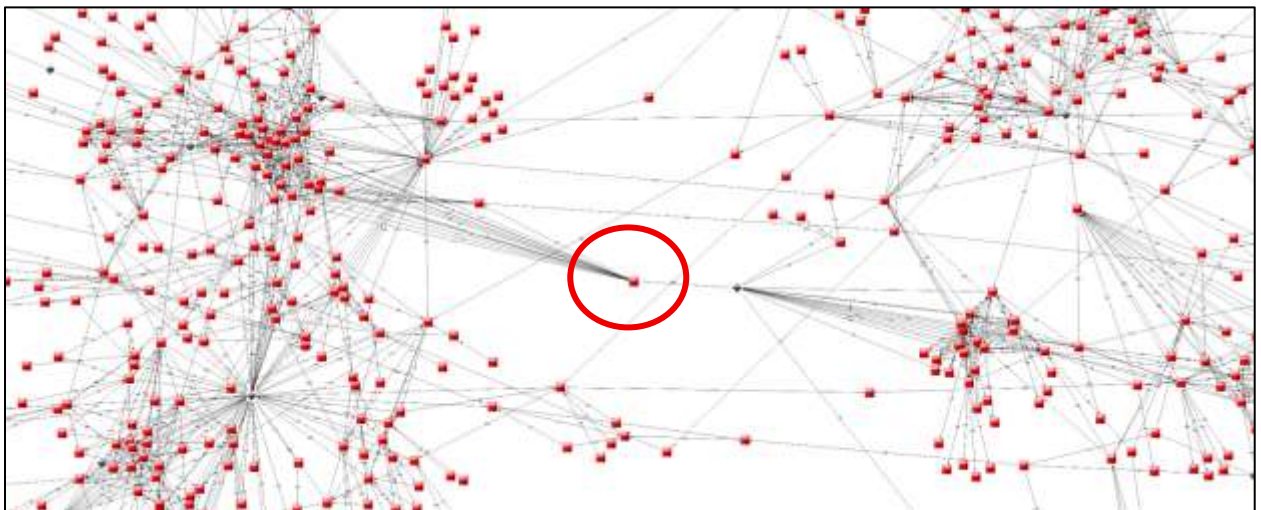
Tables 15 and 16 list the individuals in the network who hold the ten highest degree and eigenvector centrality scores, respectively. The individual with the highest degree centrality score, PN001, is a validated Blood and is connected to 41 other individuals—14 of whom are also validated Bloods. The individual with the second highest degree centrality score in the network, PN002, is *not* a validated gang member, but is tied to 25 other individuals (6 of whom are validated gang members). Recall, however, that degree centrality can be a misleading measure of well-connectedness. Indeed, PN001 only has the 15th highest eigenvector centrality score, because many of this person's ties are not connected to anyone else in the network.

Table 15. Top 10 degree centrality scores

Individual	Degree Centrality
PN001	4.99
PN002	3.04
PN003	2.80
PN004	2.68
PN005	2.68
PN006	2.56
PN007	2.43
PN008	2.43
FN001	2.31
PN009	2.19

Table 16. Top 10 eigenvector centrality scores

Individual	Eigenvector Centrality
PN004	44.62
PN003	39.44
PN005	34.63
PN007	32.44
PN009	30.94
SG001	30.93
PN010	29.62
PN011	29.31
FN002	29.04
PN012	26.35

On the other hand, the individual with the highest eigenvector centrality score, PN004, ranks fourth in terms of degree centrality. As such, based on CPD's available intelligence, PN004 is apparently the most well-connected individual in the network. The individual is a validated Blood and is connected to 22 others, 13 of whom are also validated Bloods. Figure 35 provides a side-by-side comparison of PN004 and PN001 within the network. PN004 is represented by the large red circle on the left, while PN001 is represented by the large red triangle to the right of PN004. Lines extend outward to connections from PN001 and PN004, respectively. As such, the figure displays both direct and indirect ties for these individuals. Note that although PN001 has many more direct ties, many of the ties are not very central to the network. Conversely, those connected to PN004 appear to be more well-connected than many of PN001's ties. It is important to note, however, that while many of PN001's ties are not central figures in the network, they are positioned such that PN001 appears to be connected to a variety of different subgroups. In fact, PN001 holds by far the highest "betweenness" score in the network. This is important because it means that many individuals are indirectly tied to other portions of the network *because of* their direct tie to PN001. The takeaway from this analysis is that PN001 and PN004—both of whom are validated Bloods—are very well-connected to other gang members and suspected gang members in Columbia.

Figure 35. Zoomed-in comparison of individuals in network with highest degree and eigenvector centrality scores
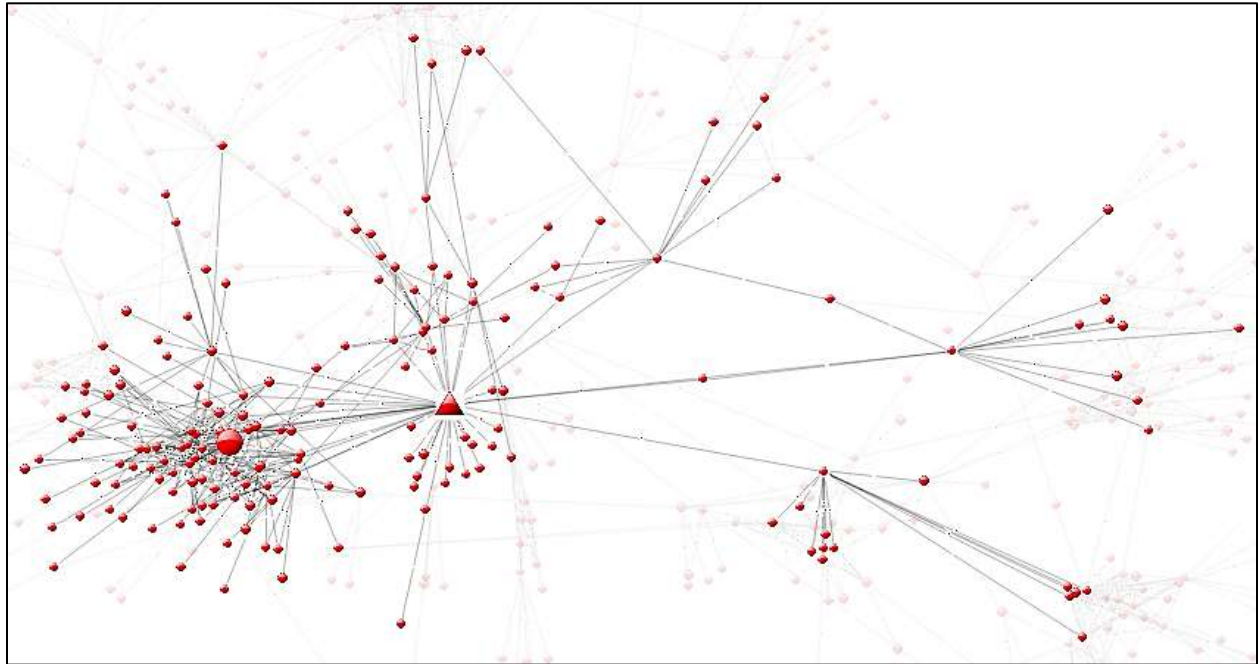
Note: Large red circle = PN004 (highest eigenvector centrality score in the network); large red triangle = PN001 (highest degree centrality score in the network).

The individual with the second highest eigenvector centrality score, PN003, is also a validated Blood, and is connected to 23 others, 13 of whom are validated Bloods. As such, this person's 23 direct ties are somewhat less well-connected than the previously mentioned individual's 22 direct ties (i.e., the individual with the highest eigenvector centrality score—PN004). Interestingly enough, the individual with the third highest eigenvector centrality score, PN005, is not a validated gang member, but is connected to 11 validated Bloods from a variety of different subgroups. These are just a few examples of complex relationships which would be hard for CPD to uncover by strictly relying on separate PowerPoint files. Indeed, shortly after the

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creation of the network, one of the individuals in the network was involved in a shooting. CPD could have used this network to quickly determine who the individual was connected to (i.e., previously arrested or field interviewed with). Investigators could then use this information to determine who to interview/question or perhaps anticipate who might try to retaliate.

Implications

The findings generated by the SNA have a number of implications for CPD. First, SNA can be a powerful tool for the Gang Unit as they attempt to validate individuals whom they suspect are gang-involved. The Gang Unit has a list of sixteen "validation" criteria. For example, one criteria that can be used in the process of establishing an individual as a validated gang member is if he/she has been "reliably identified as a group member *and* frequents group's area *or* associates with known group members." Another validation criterion is if he/she "frequents group's area *or* associates with known members *or* affects group's dress/hand signal/tattoos or symbols *and* has been arrested for offenses consistent with group activity." The accumulation of criteria such as these is used by investigators in the Gang Unit when attempting to validate individuals as gang members. Many of the individuals who have a file in the Gang Unit's folder as a suspected gang member have gang tattoos or have been photographed making gang gestures with their hands. The construction of the social network resulted in a database that links many of these individuals to numerous validated gang members (in at least one case, an individual is linked to 11 validated Bloods). Thus, moving forward, SNA can be used to assist the Gang Unit in providing evidence that suspected gang members are associating with known gang members— and therefore help validate them. SNA provides an efficient platform for this information

gathering process and can be easily used for investigative purposes in the future (e.g., i2 is user friendly, searches can be conducted with ease, and the database is easy to maintain).

Second, SNA can be used to better understand subgroup affiliations among known gang members. In many cases, the Gang Unit has only been able to classify individuals as belonging to the Bloods or Folk Nation—their specific subgroup remains unknown. Using SNA to depict who these individuals associate with can provide clues as to what subgroups they belong to. Third, hundreds of the individuals in the network are neither validated nor suspected gang members (i.e., they have no file on record with the Gang Unit). Rather, it has simply been documented on at least one occasion that they were arrested or stopped with a validated or suspected gang member. If the Gang Unit continues to use SNA they will undoubtedly learn more about these individuals and perhaps be able to determine whether or not they are in fact involved in gang-related activities.

Beyond improving the state of gang intelligence, CPD could take the results of these analyses a step further and develop a response initiative. For example, the department could implement a focused deterrence approach similar to the Boston Ceasefire Project (Braga, Kennedy, Waring, & Piehl, 2001). As a starting point, the Gang Unit could make contact with those individuals who had the highest centrality scores and let them know that CPD will be cracking down on gang activity. Alternatively, CPD could disseminate "Chronic Offender Bulletins" to its officers with information about central figures who have recently committed violent crimes (Uchida & Swatt, 2013). Finally, the potential utility of SNA reaches far beyond CPD's Gang Unit. SNA could aid with *many* CPD investigations by revealing who is connected to whom—especially when other leads run dry.

The gang SNA project's analytic effort, the entry of the data in i2 Analyst Notebook, and related analyses were conducted by one of the USC research partners with expertise in SNA (Dr. Justin Nix). The results of the analyses were presented to the Chief, members of command staff, and the Gang Unit, and the resulting data has been provided to both the CAU and Gang Unit. The presentations were well received and the Chief expressed interest in using SNA more broadly in the department (i.e., for gang activity as well as other investigative efforts). At this point, however, there have been no specific operational efforts to emerge from this project. The Gang Unit is still small with only three personnel and, therefore, will have to rely on the CAU to assist in the future utilization of SNA. Dr. Nix—the USC research team member with expertise in SNA—offered training sessions on the use of i2 Analyst Notebook and SNA more generally to the CAU members. The specific purpose of this training was to help ensure the sustainability of SNA in CPD after the grant period ended. It appears that the training was beneficial to the CAU. In the spring of 2015 an analyst was able to successfully leverage the skills he learned to use SNA during a violent crime investigation. The information from the SNA provided valuable information to CPD investigators. Unfortunately, this analyst has left CPD to pursue another job opportunity.

SNA has been shown to be a useful tool for a number of law enforcement agencies, and potentially can be valuable for CPD. The first step in making this a sustainable reality will be to hire one or more crime and intelligence analysts and train them on the use of SNA and related software. This skill set will be a valuable asset for many investigative functions in the department, particularly those focused on gang activity. In the context of gangs, the next step is to situate SNA within the larger operational effort of the Gang Unit to address gang violence in

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the city. Given the conclusion of funding under the SPI grant, these efforts will have to take

place beyond the scope of the grant period.

CHAPTER 3

OVERALL PROGRAM EVALUATION

This section of the final report provides an overall program evaluation of the Columbia SPI grant. In doing so, the chapter will examine the extent to which CPD officers become more familiar with ILP and willing to uses related policing strategies during the grant period. Furthermore, we present a process evaluation of the SPI that explores the organizational changes that took place, turnover challenges encountered, and the potential for integration and sustainability of ILP activities after the grant ends.

SECTION 1: Awareness of Intelligence-Led Policing and Related Components

One of the necessary steps in the evaluation of the SPI grant was an assessment of the degree to which CPD officers became more familiar with ILP and related components (e.g., the department's CAU) and whether their willingness to use such strategies changed throughout the grant period. The purpose of this section of the report is to present the findings garnered from this step in the evaluation. Below we cover the methodology employed in this step of the process, describe the results of the analysis, and explore the implications of the evaluation.

Data and Methods

Pre-test survey. We conducted a pre- and post-test analysis. This involved the administration of two officer-based surveys during the grant period. The pre-test survey was administered during the spring of 2013—shortly after the official start date of the SPI grant. Members of the USC research team attended 20 roll calls over a period of four days to illicit

participation in the survey from officers.[12] The target sample was limited to all sergeants and patrol officers in CPD (N = 299 at the time of the survey) because such officers' daily activities are most impacted by the use of ILP and related components (e.g., deployment strategies, focused patrol, and investigations). In short, gaining buy-in from this group of officers is key to the successful implementation of ILP efforts.

The shift sergeant leading each roll call typically allowed the researchers to conduct the survey at the beginning or end of roll call. Research team members introduced themselves to the officers, provided a brief overview of the SPI grant and the purpose of the survey, and described the voluntary and confidential nature of participation in the study. Specifically, officers were instructed to not list any identifying information on the questionnaire and were informed about the security procedures the researchers took to ensure confidentiality (e.g., only the USC researchers could access hard copy surveys to be stored in locked offices and electronic data to be stored on encrypted hard drives). This strategy resulted in 289 completed surveys for analysis which represents a 96.7% response rate. Table 17 presents the sample demographic descriptive statistics. As expected, a majority of respondent officers were male (N = 251; 87%) and self-identified as white (N = 191; 66%). Nearly one-third (31%) of the sample self-identified as a racial minority (e.g., African American, Latino, or Asian). A comparison of agency demographic data at the time of the survey indicated that the sample closely approximates CPD's composition. Additionally, 40% of the sample indicated they had a 4-year degree or higher and 29% reported military experience.

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[12] The number of roll calls ensured adequate coverage of the agency. However, it was necessary to conduct supplemental survey administration sessions with units in the agency that do not typically have a regimented roll call schedule (e.g., investigations).

Table 17. Demographic characteristics for pre- and post-test officer evaluation surveys

Variable	Pre-test			Post-test		
	M	Min	Max	M	Min	Max
Male	0.87	0	1	0.81	0	1
Minority	0.31	0	1	0.31	0	1
Four-year degree or higher	0.40	0	1	0.51	0	1
Military	0.29	0	1	0.36	0	1

Note: CAU = Crime Analysis Unit; M = mean; SD = standard deviation.

Grant-related organizational change interventions. As discussed earlier, the purpose of the SPI grant was to move CPD toward an ILP philosophy. The primary projects that took place during the grant included the repeat and near-repeat burglary intervention in North Region and the SNA geared toward the proliferation of CPD's gang member data base (both projects are discussed earlier in this report). Various CPD employees had direct and indirect involvement in each of the SPI projects and vicarious experience with the activities transpired by word-of-mouth throughout the agency. The SPI projects can be conceptualized as interventions stemming from the overall grant. That is, implementation of the projects served as SPI-related interventions that began the process of organizational change within the agency.

Additionally, from June 2013 to May 2014, the USC research partners and members of the CAU gave thirty-minute presentations to officers attending CPD's monthly recertification training.[13] During these presentations, the research partners explained the purpose of the SPI

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[13] Because all sworn officers are required to attend recertification once per calendar year, giving a presentation each month during a twelve-month period ensured that all sworn officers would see the presentation.

grant as well as how the pre-test survey fit in with the overall project. Members of the CAU also

presented information to the officers concerning their capabilities as a unit (i.e., the products the

CAU could provide to officers). Consistent with the initial grant proposal, the purpose of these

presentations was to familiarize all sworn personnel with the SPI grant, ILP principles and

practices, and CPD's CAU and its capabilities. As such, the recertification training can be

viewed as a component to the overall SPI grant intervention strategy. In short, the SPI-related

projects and the ILP-related trainings offered the opportunity for organizational changed to be

partially measured between the pre- and post-test officer surveys.

Post-test survey. To determine the extent to which the SPI grant activities had an

influence on officer awareness with ILP, we administered a post-test survey of CPD officers in

the winter of 2014 (near the end of the initial grant period). The questionnaire was administered

using QuestionPro, an online-based survey website. Consistent with the pre-test, all CPD officers

at the rank of sergeant or below were invited to participate in the follow-up survey. An email was

sent by Deputy Chief Kelly on behalf of the USC research partners to all officers fitting these

criteria. The email asked officers to participate in the USC-led evaluation by following a website

link (provided as a hyperlink in the email). The email briefly introduced the USC researchers and

the SPI grant, described the general purpose of the survey, and communicated to potential

respondents the voluntary and confidential nature of the survey. Similar to the pre-test period, the

officers were informed about the safeguards taken by the USC research team to protect

confidentiality. No identifying information was collected on the questionnaire (or through

electronic tracking on the website) and only the research team had access to the raw data. Post-

test analyses only include those officers who indicated on the post-test survey that they had attended recertification training between June 2013 and May 2014.

The online survey administration strategy resulted in 170 surveys available for analysis (40% response rate). Table 17 provides the demographic characteristics of the post-test sample. The post-test sample of officers had a slightly lower proportion of males (81%) compared to the pre-test period. However, the racial composition between the pre- and post-test was identical (31% minority). About half of the post-test sample reported having a 4-year degree or higher (11% higher than the pre-test) and 36% had military experience (7% higher than the pre-test).[14]

Survey instrument. The evaluation-centered questions were identical on each survey. Respondents were asked a series of questions attempting to capture their familiarity with ILP and CPD's CAU, likelihood of using the CAU, and perceptions of intelligence sharing within the agency.

Results

Familiarity with ILP and the CAU. Table 18 presents the descriptive statistics regarding officers' familiarity with ILP and the CAU (see Appendix C for graphical depictions

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[14] The online post-test survey was used because it was a more time and cost efficient methodology. In-person surveys require a significantly greater amount of time for data collection, coding, and cleaning and cost much more than web-based questionnaires. In an effort to collect analyzable data as close to the end of the initial grant period, we elected to use this methodology. This poses several limitations regarding the pre- and post-test evaluation. Given that the sampling methodology for each survey was different, the results across the collection periods may not be completely comparable (e.g., we may have collected data from slightly different segments of the agency). Similarly, the differences in response rates suggest that the pre-test sample may be more reflective of the agency than the post-test sample. At the same time, however, there are not drastic differences in the demographic characteristics of the samples. Furthermore, there is no way to reliably determine whether the group of officers who did not respond to the online post-test survey are different from those who participated in the pre-test questionnaire. Finally, it is important to remember that only those officers who attended recertification training between June 2013 and May 2014 (the time period when USC and the CAU were providing the SPI and ILP presentations) were included in the post-test analysis. Therefore, regardless of the slightly different methodology and lower response rate we have ensured that officers who are new to the organization or did not attend recertification are excluded from the analysis. Accordingly, there is not strong evidence to suggest that the findings of this pre- and post-test evaluation are non-comparable.

of the same results). The table presents the sample averages (M) for each question across the pre- and post-test periods. The first question we asked officers was "How familiar are you with the concept of 'intelligence-led policing'?" The question featured a 4-point Likert-type response set (1 = *not familiar at all*, 2 = *somewhat familiar*, 3 = *familiar*, and 4 = *very familiar*). During the pre-test survey the mean score across all respondents on this item was 2.37 which suggested that, on average, officers were "somewhat familiar" with ILP. The average score increased slightly during the post-test to 2.45. This suggests that CPD officers became slightly more familiar with the concept of ILP throughout the grant period but this change was not statistically significant at the 0.05 level. Thus, there is not strong evidence that officers become more familiar with ILP during the grant.

Table 18. Familiarity with ILP and the CAU during pre-test and post-test surveys

Variable	Pre-test				Post-test			
	M	SD	Min	Max	M	SD	Min	Max
Familiarity with ILP	2.37	0.85	1	4	2.45	0.90	1	4
Aware that CPD has a CAU	0.89	---	0	1	0.94	---	0	1

Note: CAU = Crime Analysis Unit; M = mean; SD = standard deviation.

Next, officers were asked "Before taking this survey, were you aware that your agency had a crime analysis/intelligence unit?" (1=yes, 0=no). During the initial survey about 89% of officers indicated that they knew CPD had a CAU. The post-test questionnaire revealed that 94% of officers were aware that their agency had a CAU by the end of the grant period. This is an encouraging result which suggests CPD officers became more aware of the CAU over the course

of the grant. The comparison of means *t*-test is statistically significant ($p = 0.03$, one-tailed test; $p = 0.06$, two-tailed test).

Willingness to use CAU. Table 19 provides the descriptive results pertaining to responding officers' willingness to use the CAU (see Appendix C for graphical depictions of the same results). To begin, respondents were asked whether they "see the crime analysis/intelligence unit as a valuable tool" (1=yes, 0=no). The pre-test survey demonstrated that 93% of respondents felt the CAU is a valuable tool to the agency. However, this belief decreased during the post-test survey. At the completion of the grant only 89% of responding officers indicated that the unit was a valuable tool. The reasons for this counterintuitive result will be explored in more detail in the conclusion of this report. For now, however, tests reveal that this change was not statistically significant which suggests that the observed difference may simply be due to chance.

Table 19. Willingness to use CAU during pre-test and post-test surveys

Variable	Pre-test				Post-test			
	M	SD	Min	Max	M	SD	Min	Max
CAU is a valuable tool	0.93	---	0	1	0.89	---	0	1
Likelihood of directly using CAU in future	2.33	1.06	1	4	2.13	1.03	1	4
Likelihood of indirectly using CAU in future	2.00	0.94	1	4	1.79	0.92	1	4
CAU should only consist of sworn officers	2.70	0.88	1	4	2.68	0.82	1	4

Note: CAU = Crime Analysis Unit; M = mean; SD = standard deviation.

To assess officer willingness to use the CAU for intelligence purposes or other necessary information/analysis, two questions were asked on the pre- and post-test surveys: "How likely

are you to directly communicate with your agency's crime analysis/intelligence unit in the future?" and "How likely is it that you will ask someone else to contact your agency's crime analysis/intelligence unit for you in the future?" The separate questions were used to assess the likelihood of officers using the unit or supervisors having their subordinates contact the CAU on their behalf. Both questions featured a 4-point Likert-type response scale (1 = *not at all likely*, 2 = *somewhat likely*, 3 = *likely*, and 4 = *very likely*). By comparing the pre- and post-test mean values for these questions we see that officers' likelihood of directly (pre-test M= 2.33; post-test M=2.13; *t*-test = 1.94, *p* = 0.053) and indirectly using the CAU (pre-test M= 2.00; post-test M=1.79; *t*-test = 2.29, *p* < 0.05) declined over the grant period. Given that these average changes are statistically significant, the findings suggest that officers are less likely to use the CAU than they were at the beginning of the grant. Again, the explanation for this finding will be offered later.

It was also necessary to assess officers' views concerning the type of employee that should work in the CAU. To do so, we asked officers to indicate their level of agreement on a 4-point Likert-type scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, and 4 = *strongly agree*) to the following statement: "Crime analysis/intelligence positions should be filled only by sworn officers." The mean score during the pre-test (M = 2.70) and post-test (M = 2.68) are nearly identical and reveal that, on average, officers agreed with the statement. Importantly, however, the perception that only sworn officers should be used in CAU positions is not overwhelmingly strong. In other words, a sizable portion of the agency appears to support civilians in this position. This view did not appear to change during the grant period.

Perceptions of intelligence/information sharing within CPD. Within the last section of each survey a series of five statements were presented to the respondent officers concerning their perceptions of intelligence sharing within CPD (see Table 20; see Appendix C for graphical depictions of the same results). Each question featured a 4-point Likert-type response scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, and 4 = *strongly agree*). First, the results demonstrate that officers, on average, disagreed that "there is adequate communication among units in this agency" during the pre-test (M = 2.21) and post-test surveys (M =2.13). The mean change from the pre- to post-test period was not statistically significant, suggesting that officers did not perceive better communication among units from the beginning to the end of the grant. The sample average score for the next statement, "I get enough intelligence information from specialized units (e.g., PACE, narcotics, etc.) in my department to do my job," again indicates disagreement during the pre-test (M = 2.09) and post-test (M = 2.37) surveys. Officers, on average, do not feel that they receive enough intelligence from specialized units in the agency. However, it does appear that officers' perceptions improved throughout the grant period because the average response was closer to "agreement" during the post-test survey, a finding that is statistically significant (t-test = 3.52, $p < 0.01$). During the first survey the sample tended to agree that "I get enough intelligence information from supervisors in my department to do my job" (M = 2.83). However, the mean score declined during the post-test survey (M = 2.57). The comparison of means t-test (3.76) is statistically significant ($p < 0.01$) suggesting that officers were less likely to believe they get enough intelligence from their supervisors by the end of the SPI grant (although, on average, the officers tend to "agree" that they receive enough information). Conversely, the officers tended to disagree that "I get enough intelligence

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information from the crime analysis/intelligence unit in my department to do my job" during

both the pre-test (M = 2.37) and post-test surveys (M = 2.35). Unfortunately, this sentiment did

not improve during the SPI grant. Finally, the results revealed that most officers agreed that

"Turf struggles get in the way of sharing information/intelligence in my department" during the

pre-test (M = 2.79) and post-test survey periods (M = 2.66). The good news is that this sentiment

seemed to decline slightly from the beginning of the SPI grant to the end (t-test = 1.63, p = 0.10).

Table 20. Perceptions of intelligence and information sharing within CPD during pre-test and post-test surveys

Variable	Pre-test				Post-test			
	M	SD	Min	Max	M	SD	Min	Max
There is adequate communication among units in this agency	2.21	0.78	1	4	2.13	0.79	1	4
I get enough intelligence information from specialized units (e.g., PACE, narcotics, etc.) in my department to help me do my job	2.09	0.81	1	4	2.37	0.80	1	4
I get enough intelligence information from supervisors in my department to help me do my job	2.83	0.68	1	4	2.57	0.71	1	4
I get enough intelligence information from the crime analysis/intelligence unit in my department to help me do my job	2.37	0.77	1	4	2.35	0.81	1	4
Turf struggles get in the way of sharing information/intelligence in my department	2.79	0.80	1	4	2.66	0.81	1	4

Note: CAU = Crime Analysis Unit; M = mean; SD = standard deviation.

Conclusion

The purpose of these surveys was to evaluate the extent to which CPD officers'

familiarity with ILP and the CAU and willingness to use the CAU changed during the SPI grant.

The goal of the grant was to begin organizational change and move the agency towards an ILP

philosophy. In doing so, several organizational activities can be viewed as interventions with

respect to this particular stage of the grant evaluation. Specifically, CPD undertook a strategic,

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evidence-based law enforcement community-level intervention (i.e., the burglary project), was involved in an SPI-focused data proliferation project (i.e., the SNA of gang members), and coordinated ILP instructional presentations during the agency's recertification training. Each of these activities was intended to provide demonstration and instruction on ILP-related principles and practices through direct or indirect experience. As such, the hope was that improvement in officers' perceptions and attitudes would be realized over the grant period. The current analyses revealed several important "take-away" findings that warrant further discussion.

First, the pre- and post-test survey evaluations revealed that CPD officers were slightly more familiar with the concept of ILP and aware that the agency has a CAU at the end of the grant than they were at the beginning of the project. This is encouraging for CPD because it indicates there was some degree of organizational change within the agency. It appears that the grant activities and recertification training exposed the principles of ILP and introduced the CAU and its capabilities to a sizable portion of the department. In fact, the results suggest that enough individuals were trained on this topic that, as a group, the agency is now more familiar with the type of policing philosophy (or, at least, strategies) CPD is hoping to adopt over the long term. Being more acquainted with the CAU and the intelligence products it offers is an important finding because having a strong working relationship between the CAU and other units in the department is vital to successful adoption of an ILP-philosophy at CPD.

At the same time, however, several less positive findings emerged from this stage of the grant evaluation. Regarding the utility of CPD's CAU, the proportion of officers in the agency who view the unit as a "valuable tool" declined throughout the course of the grant. In other words, at the close of the original grant period, fewer officers believed the CAU was useful to

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the department. Importantly, however, this decline was not statistically significant and 89% of surveyed officers still indicated that the CAU was valuable to CPD. Relatedly, and perhaps more important, a smaller percentage of officers indicated that they would either directly or indirectly use the CAU at the end of the grant compared to the beginning of the project. This is not an anticipated (or beneficial) outcome. Several events during the course of the grant may explain this result. For one, there was a large degree of turnover at CPD's executive level during the initial 24-month grant period. The agency experienced three different Chiefs and multiple command staff changes during the grant. This involved tremendously positive change for CPD in many respects. The reality, however, is that it made it difficult for the SPI grant to maintain momentum within the agency at times. Additionally, there was turnover in the CAU itself which involved a situation that may have tainted some officers' views of the unit (this turnover is discussed in more detail later). The occurrence of these events suggests that CPD officers may simply be less willing to use the CAU because of agency turnover that coincided with the grant activities and training. It is entirely possible that this sentiment can be easily changed in the near future. The extent to which this occurs will determine CPD's course toward an ILP, evidence-driven philosophy. Indeed, departments that strive to be evidence-driven and intelligence-led have emphasized their CAUs as a central fixture within the agencies (see, e.g., Braga & Schnell, 2013; Coldren, Huntoon, & Medaris, 2013; Ratcliffe, 2008; White & Katz, 2013).

Finally, one problem that is faced by many law enforcement agencies throughout the U.S. is lack of communication between units (see, Ratcliffe, 2008). "Silos" of information and intelligence are created which inhibit the efficiency and productivity of the entire department. One purpose of moving CPD toward an ILP philosophy was to improve communication and

intelligence sharing throughout the agency. Indeed, the results of the first officer survey revealed that officers, on average, did not believe there was adequate communication among units at CPD. Unfortunately, the results of the evaluation suggest there was no change in this sentiment. On the whole, officers did not begin to feel that communication improved among units throughout the grant period. It is important to note that a significant portion of the recertification training (discussed earlier) focused on the importance of information sharing within the agency but it does not appear such practices improved (from an officer perception standpoint). With respect to the acquisition of intelligence from specialized units in CPD, officers during both the pre- and post-test surveys felt there was not enough information sharing. Importantly, however, the data revealed a slight improvement in this perception at the close of the grant—more officers felt that specialized units are now providing enough information (compared to the beginning of the grant). A similar result was observed with respect to perceptions of "turf struggles" at CPD. During both surveys officers, on average, believed that turf struggles impede information sharing in the agency. However, this perception improved toward the end of the grant with fewer officers viewing turf struggles as problematic. Both results are encouraging but demonstrate the need for continued improvement.

Interestingly, officers during both data collection periods believed that enough information was shared with them by their supervisors. However, the portion of officers who held this perception declined at the end of the grant. It appears that the amount of intelligence shared by supervisors is declining in the eyes of officers. This suggests that action may be required to prevent continued decline.

There was also a strong feeling among officers that not enough intelligence or information was provided by CPD's CAU during both surveys. This is particularly problematic because the CAU must be a key player in the department's operations in order for ILP to be fully implemented. Accordingly, these results suggest that continued effort must be placed on improving the skills of CAU members. A number of steps were taken during the SPI grant to increase the knowledge, skills, and abilities of the CAU members. For example, a multiday crime analysis training seminar conducted by a leading expert in the field (Julie Wartell) took place during the grant. This technical assistance training was coordinated by the USC research partners, members of CNA (grant monitor), and CAU employees and was offered free-of-charge through BJA as part of the SPI (CAU members from neighboring agencies were also invited to the training). This training appeared beneficial to the CAU team. Continued effort from CPD must be placed on routinely training the unit and honing its skills. It is also possible that the importance and capabilities of the CAU have yet to be adequately communicated to CPD employees, which may be a possible source of the negative sentiment concerning CAU information sharing among officers. It is vital to convey to officers that in order for them to obtain good intelligence or information from the CAU, they must provide the unit with useful, clean, and regular data from the field (e.g., field interviews must be conducted on a routine basis and completed fully; incident reports must provide all relevant information and be free from errors). At the end of the day, the intelligence officers receive from the CAU will largely be the product of the quality of data they provide to the unit (i.e., the "garbage in, garbage out" analogy).

<center>**SECTION 2: Process Evaluation**</center>

This section of the report provides a process evaluation of the Columbia SPI grant. Specifically, we examine the organizational changes that occurred within CPD during the grant period that can be attributed to the SPI. It is important to remember that this section of the report evaluates agency changes that occurred simultaneously with the topics discussed earlier. Thus, some of the issues will overlap with other steps of the evaluation and some will include distinct organizational changes.

Technical Organizational Changes

Recertification training. Numerous organizational changes occurred throughout the SPI grant. Given the nature of the project, many of these changes centered on technical training and analytic capability propagation. As discussed earlier, all CPD officers are required to attend a week-long recertification training program on an annual basis. During the early stages of the grant period CPD integrated an SPI and crime analysis segment into the officer recertification training. The trainings occurred on a monthly rotation schedule (i.e., all officers should experience recertification at some point during the calendar year). Members of CAU and the USC research partners provided 30-minute presentations at each of the recertification rotations. These presentations occurred on a monthly basis from June 2013 to May 2014 which ensured that nearly all officers within the agency would be exposed to the training. A PowerPoint presentation was constructed by the USC research partners and CAU members to aid in the training. Of course, this presentation was an organic product that went through several iterations during the 12-month recertification training cycle as grant projects evolved (e.g., the burglary and SNA projects) and as we learned what type of material was most useful to the officers. A

representative snapshot of this presentation is provided in Appendix D. The first portion of the

presentation introduced the concepts of ILP, evidence-based practices, and police-researcher

partnerships. Specific goals of CPD's SPI grant were outlined for the officers and an overview of

the potential barriers to successful realization of the objectives was discussed (e.g., segregated

knowledge sources, failure to document relevant information). The remainder of the presentation

involved members of the CAU introducing themselves to the officers and briefly discussing

some of the ways they could be of assistance. For example, CAU members described some of

their capabilities in crime mapping, report analysis and generation, and the products that can

stem from field interview cards. Furthermore, the members explained the steps that officers

could take to expedite the flow of intelligence into the CAU and back into officers' hands (e.g.,

correctly filling out field interview cards). This training was intended to familiarize sworn

personnel with the SPI grant, ILP principles and practices, and the CAU's capabilities.

Importantly, CPD wished to maintain the momentum of this training effort and the CAU

continued to present at the monthly recertification trainings through the spring of 2015. This

continuation was undertaken in an effort to increase the sustainability of the SPI grant initiatives

and maintain CPD's organizational change trajectory toward an ILP-focused agency.

FLETC training. Another ILP-based training program took place at the beginning of the

grant. In May of 2013, Lieutenant Chris White (in collaboration with former Assistant Chief

Leslie Wiser and based on instructions from Interim Chief Rueben Santiago) coordinated a

training offered by the Federal Law Enforcement Training Center (FLETC). A pair of trainers

from FLETC traveled to Columbia, SC and provided a two-day course on ILP and related

activities to CPD command staff. There was one assistant chief, seven captains, one major, ten

lieutenants, and four sergeants in attendance. In addition to these command staff personnel, two crime analysts, three line-level officers, and two investigators participated in the training. In total, 30 members from CPD experienced the FLETC training. Members of the USC research team also attended the training to take notes relevant to this segment of the process evaluation.

The purpose of this training was to provide an introductory course to CPD's command staff regarding ILP, the manner in which evidenced-based policing principles should be used within a municipal agency, and methods for integrating the practices within an agency. FLETC's course provided a platform for the officers to be exposed to ILP and begin conversations about how such strategies could be implemented at CPD. For example, the officers were split into groups and instructed to develop an organization plan for the implementation of an ILP philosophy within the agency. This breakout session allowed groups of officers to discuss issues such as when COMPSTAT meetings should be held, who should be involved in such meetings, how internal and external communication should work, and develop ideas concerning an "implementation team" that would be responsible for instituting ILP at CPD. The groups then presented their plan and ideas to the class and instructors. Accountability, sharing intelligence (i.e., breaking down silos of information), data analysis integration into everyday functions, and housing the CAU under the office of the chief were all themes that were recommended from the individual groups during this session. Former Assistant Chief Wiser spoke after the group presentations and voiced how happy he was that the ILP conversation had started within the agency and that the groups' recommendations were indicative of the agency heading in the correct direction.

Several hurdles emerged during the FLETC course as well. Most importantly, by the conclusion of the training the principles of ILP and how such strategies can be used in everyday police work had not been fully articulated by the instructors. Individuals in the course were given a copy of Ratcliffe's (2008) *Intelligence-Led Policing* and several COPS Office guides on ILP and crime analysis, but the specific structure and elements of the British National Intelligence Model or Ratcliffe's ILP framework were not explored in much detail. For example, the instructors briefly discussed chronic offenders and the problem solving triangle, arguing that ILP is centered on the "offender side of the triangle" (presenter quote during the course). According to the presentation, impacting crime in specific places is extremely difficult. Of course, these are incorrect assertions that run counter to the main principles of ILP and numerous successful evidence-based policing interventions and strategies (see, e.g., Braga, Davis, & White, 2012; Braga & Schnell, 2013; Joyce, Ramsey, & Stewart, 2013; Ratcliffe, 2008; White & Katz, 2013). During the first day of the course one officer stated his concern that he "doesn't see much difference between ILP and community policing." One of the FLETC instructors responded with "no they're not so different" and went on to discuss how ILP is simply a newer version of community-oriented policing. Again, this is incorrect and misleading. Fortunately, the presenter later suggested that ILP and community-oriented policing augment each other. However, there was no discussion of how this could be done. The USC researchers were left with the impression that CPD attendees were confused about the elements of ILP with many individuals simply viewing it as a reincarnation of community-oriented policing or COMPSTAT.

Additionally, much of the conversation among officers throughout the training focused on the problem of instability at CPD. Shortly before the FLETC training CPD experienced the

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resignation of Chief Randy Scott (the Chief when the SPI grant began) and was under the command of an Interim Chief (Santiago). This represented one case in a long history of Chief turnover at CPD over the past decade (a more detailed discussion of turnover is provided below). As such, lack of leadership stability was at the forefront of many of the officers' minds during the training course. This made it difficult to gain buy-in from the command staff officers regarding ILP because they feared that it would "be a fad that will come and go as soon as a new chief is hired" (quote from officer attendee while asking the FLTEC instructors a question in front of the entire room).

Thus, the training served some positive functions for the SPI grant but also introduced unexpected interference. The research partners and CAU members attempted to correct misinformation and clarify the concepts of ILP during the recertification training (discussed above) and throughout the various phases of the grant. As will be discussed later, the new executive-level staff at CPD (including Chief Holbrook and Deputy Chief Kelly) has been instrumental in maintaining the momentum of guiding the agency toward an ILP framework. *In other words, the officers' fear at the beginning of the grant period that ILP would be a short-lived fad did not materialize*.

New analytic software. One of CPD's main goals for the SPI grant was to improve data-analytic capabilities within the CAU. Accordingly, it was essential for the agency to purchase a new software program that would help merge or, at least, simultaneously analyze disparate databases. In the early stages of the grant CPD was in contract talks with IBM to purchase a product that would seamlessly merge the agency's various databases—COPLINK. However, the initial quote for the software increased by nearly three times when the agency was finalizing an

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agreement (this price increase made the software unaffordable with the grant funds). The USC researchers and several members of CPD's command staff met to discuss alternatives. One option that was suggested by the USC research team on January 7th, 2013 was the possibility of purchasing a scaled-down version of COPLINK that would allow CPD to connect with another agency in the region (e.g., Charlotte PD). CPD could use the main source agency "hub" to access the capabilities of COPLINK without having to purchase the entire program. This option was not favored by CPD command staff in attendance at the meeting. As such, CPD command staff and CAU analysts worked to find an affordable alternative. The department eventually purchased IBM's *Modeler* program that had two important functions for the purposes of furthering the goals of the SPI grant: (1) the program allows crime analysts to simultaneously pull data from multiple databases and analyze the content in a single interface and (2) the software has a built-in predictive component (which provided the opportunity for future predictive policing functionality).

Based on our initial evaluation of the software, it was apparent that it required a significant amount of training for an analyst to be able to effectively utilize its capabilities (i.e., it has a steep learning curve). IBM provided a multiday, in-person training on the program for members of the CAU. Although this would have been an important step in the implementation of the software within the CAU, the training was largely ineffective. Most importantly, the IBM representative was under the impression that CPD simply wanted the software for its predictive capabilities. As such, the training was set up around this function. However, the IBM representative was unable to get *Modeler* to work correctly during the entire training session. This prevented the CAU analysts from learning how to use the software. There was also very

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limited training devoted toward the program's disparate database analytic capabilities. Fortunately, two CAU analysts attended another IBM *Modeler* training in Nashville, TN in the summer of 2014. This training was more effective and introduced the analysts to several important functions of the program.

Given turnover within the agency, however, *Modeler* has yet to be fully integrated into CPD's everyday activities. As will be discussed later, Chief Holbrook's vision to establish a "real-time" CAU will allow for the increased use of the software within the agency in the future. CPD is also currently exploring other software options that will allow the agency to integrate and analyze its disparate databases. Most recently (as of April 2015), CPD command staff have discussed the possibility of purchasing the "hub" version of COPLINK and connecting with a neighboring agency that houses the full program.

BJA technical assistance training. The issues associated with some of the prior training discussed above led the USC researchers to search for new training opportunities for CPD's CAU. Collaboration between the CNA Corporation, the research partners, and CAU analysts resulted in the scheduling of BJA crime analysis technical assistance training. Such technical assistance is available free of charge to SPI sites and grantees are encouraged to utilize the resource. In the summer of 2014, Julie Wartell—a BJA and CNA crime analysis subject matter expert—provided a multiday training module on crime analysis and data analytic skills. A nationally-recognized expert on the topic, Wartell's training proved invaluable to members of the CAU. The training provided instruction on the use and importance of crime analysis in modern local law enforcement and an overview of software programs available for data analysis and crime mapping. Wartell also incorporated field-work into the course. CPD invited CAU

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members from neighboring agencies in an effort to open the ILP and data sharing dialogue with these entities. In conversations with CPD's crime analysts, the technical assistance was the most useful training they experienced during the grant period.

New crime analyst hired. As discussed throughout this report, the primary focus of the Columbia SPI grant was to move the agency toward an ILP philosophy. Prior to the grant beginning the agency had one civilian crime and intelligence analyst. As the SPI grant started, the agency realized that one of their top priorities would be to hire another crime analyst. CPD successfully hired a second civilian crime analyst (Mr. Jamie Marchbanks) in December of 2012 (near the official start date of the SPI grant). The new hire proved invaluable to CPD and the direction of the SPI-related projects. Mr. Marchbanks was quickly trained by the existing analyst and benefited tremendously from the various training opportunities discussed above. He quickly became an important person not only in the CAU but within the agency in general. Unfortunately, in February of 2014, the original CPD crime analyst resigned from her position in the agency, leaving the CAU with only one member. CPD quickly put together a plan to recruit and hire a new analyst for the vacant position. The agency successfully hired a new analyst in June of 2014. Again, this addition was valuable for CPD because the individual brought with him prior military intelligence analysis experience (however, further turnover at this position will be discussed below). The recruitment of qualified and motivated crime analysts was instrumental to the SPI grant and to CPD's larger goal of moving toward ILP. The agency's commitment, particularly under the leadership of Chief Holbrook, to growing the CAU is evidence of its desire to incorporate evidence-based practices into its everyday operations.

Other technical changes. Several other technical changes that occurred during the grant are worthy of note. During the first year of the SPI several surveillance cameras were purchased by CPD. The cameras were intended to be used in the burglary intervention (discussed earlier) target neighborhood. Additionally, CPD wanted to use several of the cameras in strategic locations throughout Columbia (e.g., high traffic intersections and entertainment districts). Importantly, however, the use of cameras within the department was quickly decoupled from the SPI grant due to turnover of key command staff personnel responsible for their implementation. In short, the USC research partners were not exposed to meetings regarding camera implementation, installation, and monitoring. Accordingly, the effects of the cameras cannot be analyzed.

Additionally, the agency has begun using i2 Analyst Notebook with greater frequency. As discussed earlier, this program provided the primary analytic tool for conducting the gang SNA. Based on the presentation of this project to CPD command staff and USC research team training offered to the CAU members, the software has recently been used by the agency for real-world investigative functions (mentioned earlier in the "SNA" section). It appears that the agency is primed to use the program to its advantage with even greater frequency even as the SPI grant comes to a close.

Turnover Challenges

Executive-level turnover. One of the persistent problems encountered during the grant period was turnover within the agency. Upper-management turnover is something experienced within all law enforcement agencies (including several other the SPI sites), but CPD's changes had important implications for the direction of the SPI grant. Randy Scott was Chief of Police

during the formulation of the SPI grant proposal, receiving of the award, and initial months of the project. However, on April 22, 2013 Chief Scott resigned from CPD. Accordingly, the agency and research partners were faced with uncertainty concerning the direction of the project only four months into the grant. Fortunately, former Assistant Chief Wiser was the project's primary champion within the agency (and a key figure in the attainment of the grant) and point-of-contact for the USC research team. The research partners also had a strong working relationship with the senior crime analyst at the time. Furthermore, Ruben Santiago—who was an instrumental command staff member in the project—was appointed Interim Chief. Thus, despite the loss of an important figure within the agency, the grant was able to successfully continue because we had the support of influential officers in the department. The transition caused delays in the implementation of grant activities but projects were continued in a relatively short period of time under the leadership of these individuals.

Interim Chief Santiago was in office for nearly one year and oversaw foundational elements of the SPI. For instance, under his direction the agency and research partners successfully conducted the neighborhood survey, engaged in a problem-oriented analysis of burglary issues in North Region that culminated in the foundation of the evidence-based strategic plan, and the gang SNA was started. Interim Chief Santiago left CPD in the spring of 2014 when he was replaced by a new Chief of Police.

Leadership stability was attained within the agency when W.H. "Skip" Holbrook was appointed Chief of CPD on April 11, 2014. Chief Holbrook immediately formulated goals for the agency, one of which revolved around the development of the CAU and its capabilities. The USC research partners met with the Chief shortly after he took office to brief him on the SPI

grant. It became clear very quickly that he was going to be a key champion of the project and supporter of its goals. Under his leadership, CPD and the research partners successfully finalized the burglary intervention operational plan for Hyatt Park, conducted the burglary intervention that achieved encouraging results, and completed the gang SNA. In short, Chief Holbrook's leadership was invaluable to the success of the grant.

Crime analyst turnover. As mentioned earlier, there was also considerable turnover within the CAU itself. The crime analyst who was the research team's point-of-contact through a majority of the grant period resigned from CPD in February 2014. This was a significant loss for the SPI. The analyst was responsible for many of the day-to-day operations of the grant-related projects and had strong working relationships with command staff in the agency. As a result of her departure, we lost a key figure in the SPI who was instrumental in maintaining momentum within the individual projects. Fortunately, however, the other crime analyst—Mr. Marchbanks—played a vital role in the projects throughout the grant period. He gained valuable training and experience that allowed him to take over as the primary CAU point-of-contact between CPD and the research partners. His skills and abilities quickly developed throughout the grant (through his own work ethic and training provided through the grant). In short, Mr. Marchbanks afforded us the opportunity to continue the SPI projects and his skills and services proved invaluable to the success of the grant. CPD also quickly initiated a search for a new analyst. The CAU gained a second crime analyst in June of 2014 but, unfortunately, he was terminated from employment around November of 2014. Turnover within the CAU presented many difficulties on our path toward using ILP interventions within the agency that relied on accurate, timely, and informative data analysis. Despite such issues, however, key figures such as

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Mr. Marchbanks helped the grant projects continue with relatively short periods of interruption during the transitions. Near the end of the grant (April 2015), however, Mr. Marchbanks resigned from CPD to pursue another employment opportunity. It will be important for CPD to quickly find a well-qualified replacement if the agency wishes to continue movement toward an ILP philosophy.

   Line-level turnover. To this point, we have referred to challenges that turnover at the command staff level of the agency and CAU presented. It should be noted, however, that turnover occurred at the other levels of the agency as well. On December 9, 2014, Chief Holbrook launched a Recruitment and Retention Initiative which focused on CPD attempting to fill 45 vacant law enforcement officer positions and provided a 7% pay increase to all existing employees. The retention and recruitment of quality officers in the agency impeded some aspects of the grant activities. For example, of the 170 officers who completed the second officer-based survey, 27 (or about 16%) indicated that they had *not* attended recertification between June 2013 and May 2014. This suggests these 27 officers (at or below the rank of sergeant) were hired at some point during that 12-month period. As such, these newly hired officers did not receive training from the research partners or CAU on the purpose of the SPI grant, ILP, evidence-based practices, or police-researcher partnerships. To be fair, turnover is a normal occurrence in any profession. Yet such a high degree of turnover can be problematic for a law enforcement agency attempting to generate organizational change. Fortunately, however, Chief Holbrook's recruitment and retention initiative is a prime example of his leadership focus—hire and retain good officers to provide stability within the agency. The beneficial results of such practices already appear to be materializing within CPD.

Although the turnover discussed above caused important delays in grant activities at times and limited officer buy-in during certain phases (due to uncertainty about the direction of the department), we were fortunate to consistently have individuals within the agency who supported the SPI. One individual in particular, Deputy Chief Melron Kelly, was one of the most consistent members of the SPI team throughout the majority of the grant. To say that Deputy Chief Kelly "bought-into" the idea of ILP and the SPI would be an understatement. He was an unwavering supporter of the grant project and staunch advocate for leading CPD into an evidence-based police agency. For instance, he was instrumental in the initial stages of the burglary project when we was Captain of North Region and oversaw the successful implementation of the intervention after he had been promoted to Deputy Chief. He also joined the research partners during SPI presentations at CNA and an Academy of Criminal Justice Sciences conference and emphatically participated in the learning and networking that occurred at these events. In short, the grant would not have been successful without Deputy Chief Kelly.

Integration and Sustainability

There were several organizational changes that occurred within CPD during the SPI that may prove important to the continued integration and sustainability of ILP practices within the agency's operations. First, at a very basic level, the agency went through several reorganizations of the CAU. Toward the beginning of the grant the CAU was placed directly lateral to the Chief's office in the chain of command. The purpose of this move was to facilitate direct and open communication with the executive-level command staff and the CAU. The hope was to avoid chain of command problems that may have occurred if the CAU was housed within a different organizational structure. In short, CPD command staff at the time wanted the CAU to

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have freedom to successfully accomplish tasks within the agency. As time went on, however, the CAU was moved to the Records Bureau within the agency's organizational chart. This was done in an effort to provide the CAU with more direct access to various data sources and for its members to have immediate supervisors. This changed was geared toward allowing the unit to work together to facilitate projects for different entities within CPD.

Second, and perhaps most encouragingly, CPD decided to make the burglary project a region-wide standard operating procedure. The specific responses to burglaries outlined earlier are now part of how all burglary incidents are handled in North Region (personal communication with Captain Tim Holbrook). Furthermore, aspects of the intervention have also been successfully implemented in the South Region to address recent increases in residential burglaries in its neighborhoods. Appendix E provides a recent local news article that details CPD's efforts at reducing burglary in the Melrose Heights neighborhood using strategies consistent with Operation TAD. The integration of these ILP-focused burglary policing practices into the operations of the agency offers great hope that aspects of the SPI will be sustained within CPD once the grant ends.

Finally, as discussed earlier, the hiring of Chief Holbrook provided stability that the agency long needed. One key goal he set for the agency at the beginning of his tenure was the development of a "real time CAU." Ultimately, his goal is to integrate the CAU into the everyday activities of the agency to such an extent that the unit will be able to provide real-time data analysis for law enforcement operations and initiatives. This goal is directly in line with the overarching purposes of BJA's Smart Policing Initiative and suggests an optimistic outlook for the continued integration of ILP into the department and sustainability of the grant's activities.

CHAPTER 4

SUMMARY AND CONCLUSIONS

The final section of this report provides a brief summary of the outcome and process

evaluation findings from the Columbia, SC SPI grant project. Again, the overarching purpose of

the SPI was to motivate organizational change within CPD—encourage the agency to adopt an

ILP philosophy and use data analysis during its everyday operations. Three primary and

interrelated evidence-based policing projects took place through the SPI that speak to this goal.

Summary of Project Findings

Community survey. The first project served as a foundation for the others and elicited

community participation with the agency. The community outreach survey verified CPD

officers' beliefs and echoed official crime data—burglary and gangs were two of the most

common problems according to Columbia residents. The survey was important during the initial

phases of the SPI grant for several reasons. For one, it allowed CPD to elicit citizens' concerns.

Allowing residents a voice in law enforcement practices is seen as vital to obtaining cooperation

from the public and establishing a trusting relationship between the police and citizens (Jackson

et al., 2013; Nix et al., 2015; Reisig et al. 2007; Tyler, 1990, 2004). Second, the survey served as

an important component in the problem-oriented approach taken by CPD and the research

partners to identify key problems to be addressed during the SPI grant. When combined, the

survey results, official data, and detailed analyses of the burglary and gang problems in

Columbia offered a triangulation of data sources that provided a detailed picture of the issues in

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the city worthy of attention with the SPI. In short, this project enhanced the overall evidence-based policing efforts of the SPI.

   Burglary intervention. Second, the Columbia repeat and near-repeat burglary project used a SARA-type approach for problem identification, analysis, and intervention. The preliminary analyses revealed important time and space patterns of burglary within the intervention target area. Specifically, our analyses revealed that a significant portion of all burglaries are repeats and near-repeats. What is more, repeat and near-repeat burglaries were most likely to occur within a few weeks and 500 feet from the initial burglary. This is important because it replicates previous research conducted in different areas of the US and within the UK. In short, these results underscore the importance of taking additional time to analyze the potential intricacies of burglary problems for law enforcement agencies facing similar issues. Most importantly, this robust analysis allowed CPD to focus its limited resources in an intelligent manner to have the greatest potential for success.

   To address the repeat and near-repeat burglary problem in Columbia, the SPI team developed an operational intervention that was modeled after projects that had been successfully implemented in several other agencies in the US and UK. Ultimately, the intervention produced encouraging results. Most importantly, we observed a significant decline in burglaries in the Hyatt study area, control area, and the North Region overall. It is difficult to determine whether these results reflect a general burglary decline trend across the region where the intervention site was situated. At the same time, however, it is equally difficult to ascertain whether the intervention effects spilled over into other areas of the region. At the very least, we know that the frequency of burglary in the target area did not increase during the intervention period. As such,

the results provide positive, albeit preliminary, evidence that the intervention implemented in Columbia may be a viable strategy for combating residential burglary.

Furthermore, anecdotal evidence from officers who were tasked with the responsibility of conducting the burglary intervention process indicates that community members routinely voiced support of the agency's effort to reduce the occurrence of burglary. Citizens often commented to officers who distributed the door hangers or filled out security surveys that they noticed CPD was providing increased attention and non-traditional policing strategies (e.g., door hangers). This suggests that the intervention was sending the message to community members that CPD truly cares about the well-being of the neighborhood. Officers and supervisors in North Region were clear on this issue—if the burglary intervention was only successful in helping the agency connect with the community the overall project was worth the effort. The officers believed that increased community support, cooperation, and trust, while difficult to quantify, were a direct result of the burglary intervention.

Finally, several officers and supervisors believed the intervention was a success partially because it caused "rent-a-center" burglaries to become nearly nonexistent in the target area. According to officers, prior to the intervention a nontrivial number of burglaries in the target area involved rental center items being "stolen" from a home shortly before payment was due or the item was to be returned. In reality, however, many of these cases simply involved residents attempting to defraud rental centers of rented items (e.g., TVs, furniture). During the intervention period, those who would have attempted to file such a false police report appeared to be at least partially dissuaded from doing so as a result of the intervention activities in the neighborhood. Of

course, we do not have empirical data to support this conclusion but official reported burglary data combined with officer accounts seem to suggest that it is plausible.

Gang SNA. Third, the gang SNA project rounded out the initiatives undertaken during Columbia's SPI grant. The use of SNA was rooted in ILP philosophies and aimed at providing CPD with an evidence-based policing tool. As discussed earlier, we argue the gang SNA was successful for several reasons. Most importantly, the SNA successfully improved CPD's existing gang intelligence database. Prior to the grant the Gang Unit's database consisted of individual PowerPoint files of each validated or suspected gang member. It is safe to say that this was an inefficient data storage method that provided little (if any) analytic capabilities. The gang network analysis initiated by the USC research partner has provided the agency with the opportunity to close this gap in its abilities. What is more, the network is maintained in a user-friendly software program (i2 Analyst Notebook) which will allow the Gang Unit to continue development of the data and use the intelligence for analytic and investigative purposes. In the end, the SNA component of the SPI grant provided the agency with an ability to intelligently gather data on gang members and associates. This is important considering the very limited resources available to the Gang Unit and the agency's desire to continue moving toward an ILP philosophy. We believe the SNA project has provided the agency with the resources necessary to continue these SPI-related efforts after the grant period comes to a close. Additional training will be required to continue this momentum if the agency hires new crime analysts.

Summary of Program Evaluation Findings

Officer awareness of ILP and related components. Our analyses revealed that CPD officers became more familiar with the concept of ILP and aware the department has a CAU

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throughout the course of the SPI grant. This is an encouraging result that can be attributed to the grant activities and CPD's leadership (particularly Deputy Chief Kelly and Chief Holbrook). Although it is difficult to pinpoint a specific cause of this improvement, it is likely that a combination of the recertification trainings, communication by command staff emphasizing the importance of data analysis, and the successful SPI projects discussed above impacted officers awareness of ILP and the CAU. The multifaceted approach taken by the Columbia SPI team may be beneficial for other agencies hoping to introduce their officers to evidence-based policing and its associated components.

There were also several negative results garnered from the pre- and post-test officer surveys that warrant additional discussion. In particular, fewer officers viewed the CAU as a valuable tool or indicated they would use the unit at the end of the grant compared to the beginning. We believe that turnover was one of the main reasons these results emerged. Turnover at both the command staff level and within the CAU itself made it difficult to integrate the CAU into the everyday operations of the agency. Furthermore, turnover in the CAU was marred in scandal that may have negatively impacted officers' perceptions of the unit and its capabilities. Such events were unavoidable from the grant's standpoint but, nonetheless, should be considered as possible barriers for future agencies attempting organizational change toward an ILP framework. It is also possible that other issues within the agency made it difficult for officers to fully appreciate the utility of the CAU. After all, our results revealed that respondents believe there was not enough information sharing and significant turf struggles during both waves of the officer survey. Instability at the Chief position for many years in the agency may have contributed to this problem. The leadership being provided by Chief Holbrook, however,

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offers the indication that such silos are beginning to crumble. This process may also help improve officers' perceptions of the CAU and its utility within CPD's operations.

Process evaluation. Finally, there were several process evaluation outcomes that are worthy of reiteration. A number of technical organizational changes occurred during the SPI that illustrate the success of the grant. The monthly recertification trainings offered by the CAU and USC research partners appeared to be influential in getting the word out about the SPI grant and introducing officers to the principles of ILP. The BJA technical assistance also proved instrumental to the CAU. The purchase and utilization of new software programs such as IBM's Modeler and i2 Analyst Notebook also satisfied one of the primary goals of the grant—to more intelligently gather and analyze agency data that was previously contained in disparate or unmanageable formats. Unfortunately, IBM Modeler did not materialize as being the beneficial program that CPD originally hoped. Fortunately, however, the agency is currently looking into purchasing COPLINK as part of the final stages of the SPI grant.

As discussed at length, turnover within the agency presented significant challenges throughout the grant period. This is not a new problem nor idiosyncratic to CPD. It is important for future SPI sites, however, to anticipate this problem and plan accordingly. We experienced turnover at every level of the agency including the Chief's office, executive-level command staff, CAU, and line-level officers. Key to the grant's success, however, was the SPI team's ability to quickly establish new agency connections and maintain relationships with existing key supporters of the project. This issue also relates to the integration and sustainability of SPI-related practices after the grant ends. As we observed, successful integration of ILP practices and initiatives partially hinges on stability within the Chief's office. We firmly believe that the

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sustainability of the ILP foundation started under the SPI grant is primed for success under the leadership of Chief Holbrook who has brought stability and direction to the agency.

Lessons Learned

A number of "lessons learned" for CPD and other agencies can be gleaned from the discussion and analyses presented in this report. However, we would like to briefly highlight several of the key take-away lessons we observed. For starters, assessing public opinion is a valuable tool that law enforcement agencies should leverage. Our project revealed that citizens simply appreciate it when agencies ask their opinion. After all, the public represents police agencies' customers and it is wise to listen to them. What is more, the information provided in public opinion/perception surveys can be valuable to agencies attempting to prioritize their resources. Such survey data can be used to corroborate official data and anecdotal evidence when agencies reach out to the federal government (or other entities) for funds or support in combating particular problems in their jurisdiction. Second, the repeat and near-repeat burglary analysis and intervention completed by the present study provides a great platform for police agencies wishing to address this notoriously difficult crime. Traditional policing strategies have little impact on burglary rates but victimization by such events is routinely cited as key problem throughout many jurisdictions. The process CPD used to address residential burglary offers promise to other jurisdictions facing similar problems.

Similarly, SNA proved to be a useful strategy within the current project. ILP-focused or aspiring agencies may also find SNA to be helpful in the proliferation of gang intelligence. In short, SNA allows agencies to better understand the complex nature and extent of gang problems in their jurisdiction. We encourage other agencies to use SNA to address other criminal offenses

such as credit card fraud, shoplifting, or car break-ins. Such crimes are often accomplished by groups of criminals (whether they are gang-related or not) and SNA may offer a useful investigative and intelligence-gathering tool.

Finally, similar to most SPI sites funded by BJA, our project underscores the utility of police practitioner-researcher partnerships. Each group brings experiences and skills to the table that, when combined, can lead to important initiatives that improve citizens' quality of life and community safety. Thus, we echo many of our colleagues by encouraging police agencies to leverage the power of police practitioner-researcher partnerships (see, e.g., Alpert, Rojek, & Hansen, 2013; Hansen, Alpert, & Rojek, 2014; Rojek, Smith, & Alpert, 2012; Rojek, Alpert, & Smith, 2012). It is important for researchers to realize that they bring a limited set of experiences and skills to such partnerships. While they may be the experts from a research standpoint, it pays dividends for researchers to remain open-minded to the realities of police work during such projects. Likewise, it is important for agencies to realize that researchers are often interested in participating in such partnerships for reasons that extend beyond data access and publication opportunities. Many researchers, especially those involved in SPI grants, are truly invested in improving the operation of local police agencies and engaging in projects that can improve communities and the lives of residents.

Conclusion

In conclusion, there are two take-away messages that we offer as guidance to future BJA and CNA Smart Policing projects. First, the Columbia SPI found the BJA technical assistance to be quite useful to the grant. Not only does such assistance offer practical skills for key members of SPI teams but it also communicates to the SPI sites that BJA views them as valued partners in

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the overall Smart Policing Initiative. We encourage BJA to continue such efforts. Second, one of the overarching lessons from the Columbia SPI was that focused projects may be more manageable for agencies that are in the infancy of ILP. CPD fell into this category at the beginning of the grant and the SPI team quickly realized that wholesale "organizational change" would be difficult. Organizational change of any extent is a tall order and it may be more fruitful to focus efforts on specific ILP-centered interventions and initiatives as the current study did. This strategy would allow agencies new to ILP to be "coached" on its principles and learn how evidence-based strategies can be leveraged within their jurisdictions. Most importantly, this strategy will help officers throughout an agency witness the ILP process and successful initiatives associated with evidence-based policing. Experiencing ILP success stories, even if on a small scale, can prove vital to officer buy-in. Indeed, organizational change toward ILP will be more successful when agencies and research partners are willing to take small steps towards its implementation. Real-world, small-scale examples can encourage motivational change within individual officers that can prove instrumental to long-term integration of sustainability of ILP.

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APPENDIX A

Community Survey Questionnaire

NEIGHBORHOOD SURVEY

Please help us to better serve your neighborhood by answering the following questions. *If you received this survey at a business address, please answer the questions in relation to the location of your business.* For each question, place an 'X' in the box that corresponds to the correct response. Participation is voluntary and all of your responses will be anonymous.

NEIGHBORHOOD ISSUES			
Please indicate how much of a problem the following matters are <u>*in your neighborhood*</u>:	**Not a problem**	**Somewhat of a problem**	**Serious problem**
Garbage/litter on or along the streets			
Excessive noise (for example, loud parties, stereos, barking dogs, etc.)			
Vandalism (for example, graffiti, destruction of property, etc.)			
Drunk drivers on the road			
Traffic problems (for example, speeding or reckless driving)			
People drinking in public			
People using/selling illegal drugs			
Groups of teenagers or others loitering or simply "hanging out"			
Presence of youth gangs			
Prostitution			
People fighting in public			
People arguing in a hostile manner in public			
People's homes being broken into and things being stolen			
People being robbed (i.e., "mugged" or "held up")			
Gunshots			
Other violent crime			
FEAR OF CRIME			
Please indicate how much you agree or disagree with the following statements.	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
I generally feel safe walking alone at night in my neighborhood.				
I generally feel safe and secure in my home.				
In the past month, fear of crime has prevented me from doing things I would like to do.				

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CONTACT WITH POLICE		
Please answer the following "yes or no" questions.	**Yes**	**No**
During the past 6 months, have you had any contact with a Columbia Police Department officer?		
If you answered yes to the previous question, was this contact ever initiated by the officer (for example, a traffic stop or any other case where the officer made contact with you)?		

VICTIMIZATION					
Please indicate how many times the following has happened to you _in the past 6 months_:	**0**	**1**	**2**	**3**	**4 or more**
Your vehicle was stolen.					
Your vehicle was broken into.					
Your property was vandalized or destroyed.					
Someone broke into your home or another building on your property.					
Someone (other than a romantic partner) physically harmed you with their hands, fist, or feet.					
Someone (other than a romantic partner) used or threatened to use a knife, club, gun, or other weapon on you.					
Someone used or threatened to use force to take something from you.					

NOTIFYING THE POLICE					
How many times did you contact the police after being victimized by the following crimes _in the past 6 months_?	**0**	**1**	**2**	**3**	**4 or more**	**Does not apply**
Your vehicle was stolen.					
Your vehicle was broken into.					
Your property was vandalized or destroyed.					
Someone broke into your home or another building on your property.					
Someone (other than a romantic partner) physically harmed you with their hands, fist, or feet.					
Someone (other than a romantic partner) used or threatened to use a knife, club, gun, or other weapon on you.					
Someone used or threatened to use force to take something from you.					

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SATISFACTION WITH THE POLICE				
Please indicate how much you agree or disagree with the following statements:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
The police in my neighborhood treat citizens with respect.				
The police in my neighborhood take the time to listen to people.				
The police in my neighborhood treat people fairly.				
The police in my neighborhood explain their decisions to the people they deal with.				
The police in my neighborhood give minorities less help because of their race.				
The police in my neighborhood provide better services to wealthy citizens.				
You should accept police decisions even if you think they are wrong.				
You should do what the police tell you even if you disagree.				
The police can be trusted to make decisions that are right for my community.				
The police are doing a good job in my neighborhood.				
There are enough police in my neighborhood.				
NEIGHBORHOOD COHESION				
How likely is it that your neighbors could be counted on to do something if:	**Very Unlikely**	**Unlikely**	**Likely**	**Very Likely**
Teenagers were skipping school and hanging out on a street corner?				
Teenagers were spray-painting graffiti on a local building?				
Teenagers were showing disrespect to an adult?				
A fight broke out near your home?				
The fire station close to your home was threatened with budget cuts?				
Please indicate how much you agree or disagree with the following statements:	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
People around here are willing to help their neighbors.				
This is a close-knit neighborhood.				
People in this neighborhood can be trusted.				
People in this neighborhood generally do not get along with each other.				
People in this neighborhood do not share the same values.				
DEMOGRAPHIC INFORMATION **Please answer the following questions by selecting or writing in the single best response.**				
Did you receive this survey at your residence or at your place of business? ☐ Residence ☐ Business				

Age: _____

Please indicate your gender:
    □ Male
    □ Female

With which of the following race/ethnicities do you most identify?
    □ Non-Hispanic White or Caucasian
    □ Non-Hispanic African American
    □ Hispanic or Latino
    □ Asian
    □ Multiple races
    □ Other (please specify): _____

Highest completed level of education:
    □ Less than a high school diploma
    □ High school diploma or GED
    □ Some college
    □ Bachelor's degree or higher

Are you married?
    □ Yes
    □ No

How many children under the age of 18 are currently living in your household? _____
Please list the street names of the intersection closest to your home, or if you received this survey at your place of business, list the street names of the intersection closest to your business. This will allow us to understand which issues are *specific to your community*.   _____ & _____

Have you been at this address for at least 6 months?
    □ Yes
    □ No

COMMENTS **If you have any additional comments, please provide them in the space below.**

This is the end of the survey. Thank you for your participation! Please return the survey in the self-addressed stamped envelope to:
Department of Criminology & Criminal Justice
1305 Greene Street
University of South Carolina
Columbia, SC 29208-0001

APPENDIX B

Community Survey Press Release

USC Conducts Survey of Columbia Residents on the issues of Crime, Disorder and Satisfaction with the City's Police Department.

Researchers from USC's Department of Criminology and Criminal Justice conducted a survey of Columbia residents earlier this summer which dealt with perceptions of and experiences with crime and disorder as well as satisfaction with the police. The survey is part of a larger Smart Policing grant awarded to the Columbia Police Department in September 2012 by the Bureau of Justice Assistance in the U.S. Department of Justice. The grant centers on a partnership between CPD and USC, whereby the two partners will strive to incorporate the principles of intelligence-led policing in the agency in order to improve their response to crime and disorder issues in the city. This involves the two groups working together to improve data analysis in order to more effectively direct department resources. As a part of these efforts, the USC partners conducted a survey of Columbia residents to gain additional insight beyond official department data pertaining to how citizens view problems in their community as well as their perceptions of the department.

The survey was administered using a mixed strategy that involved mailing hardcopies of the survey and making it available on the internet. A sample of residents within a few communities in Columbia received mailed surveys. Communities were selected according to variation in levels of reported crime and socio-economic characteristics. The survey was publicized through press releases which informed Columbia residents that if they did not receive a survey in the mail, they could still participate by completing the survey online. A total of 1,988 residents responded to the survey, 85% of the respondents were from the mailed sample and 15% were from other residents responding through the internet.

Regarding perceived crime and disorder, residents expressed the highest levels of concern for homes being broken into. Additionally, they reported moderate concern for traffic problems and garbage/litter in their neighborhood. Finally, almost 40% of residents expressed concern for excessive noise and gunshots in their neighborhood. Regarding fear of being the victim of a crime, over 50% of residents say they do not feel safe walking alone in their neighborhood at night, while 17% do not feel safe and secure in their homes. Furthermore, nearly 30% of residents reported that fear of crime has prevented them from doing something they would like in the past month. In relation to victimization, property related crimes were the most frequently reported: 12% of the respondents reported being the victim of vandalism in the past six months, 10% the victim of an auto break-in, and 9% the victim of burglary. It is important to note that these represent overall results of the survey respondents. The reported perceptions and experiences vary across and within communities. In addition, some of the victimizations may have occurred outside the city, while fear preventing citizens from doing activities may be related to events or locations outside the city.

The questions on perceptions of Columbia Police Department officers were divided into three categories: officer fairness, police legitimacy, and satisfaction with the police. Officer fairness refers to how the residents feel CPD officers patrolling their neighborhood treat citizens. In relation to fairness, 86% or more of the residents felt officers in their neighborhood treat citizens with respect, listen to people, treat people fairly, and explain their decisions. A small portion of residents felt officers treat people differently based on race and/or wealth--16% and 21%, respectively. Legitimacy was intended to capture levels of respect for and trust in officers. While only 36% of residents feel they should accept the decisions of officers even if they believe
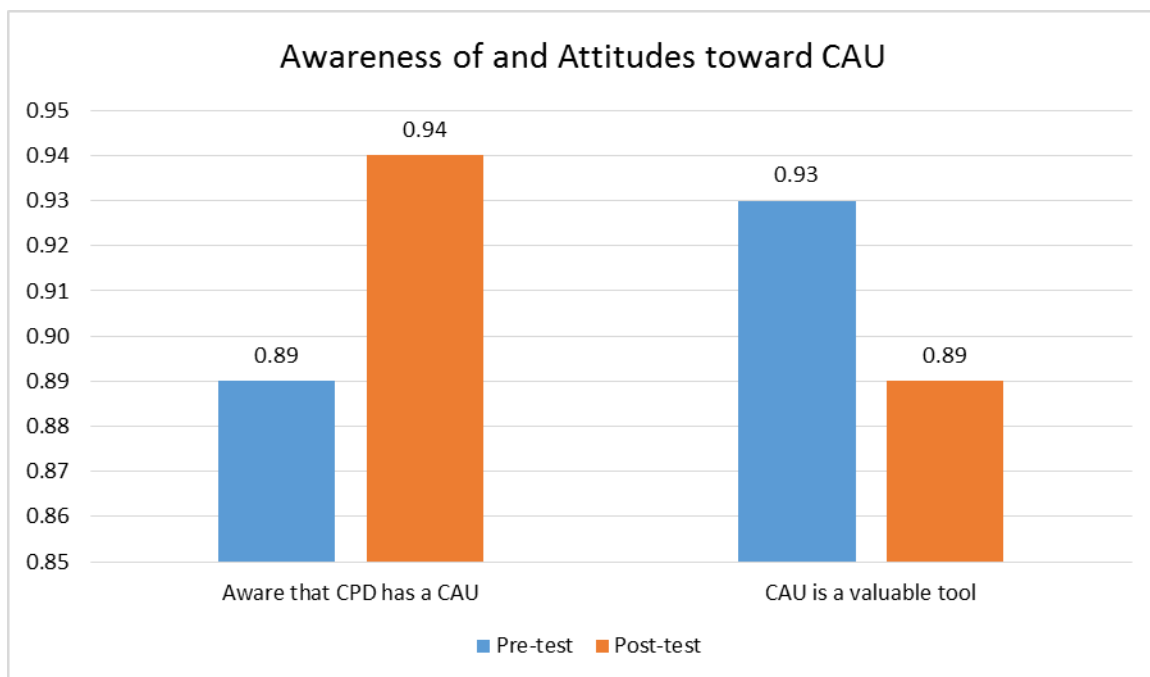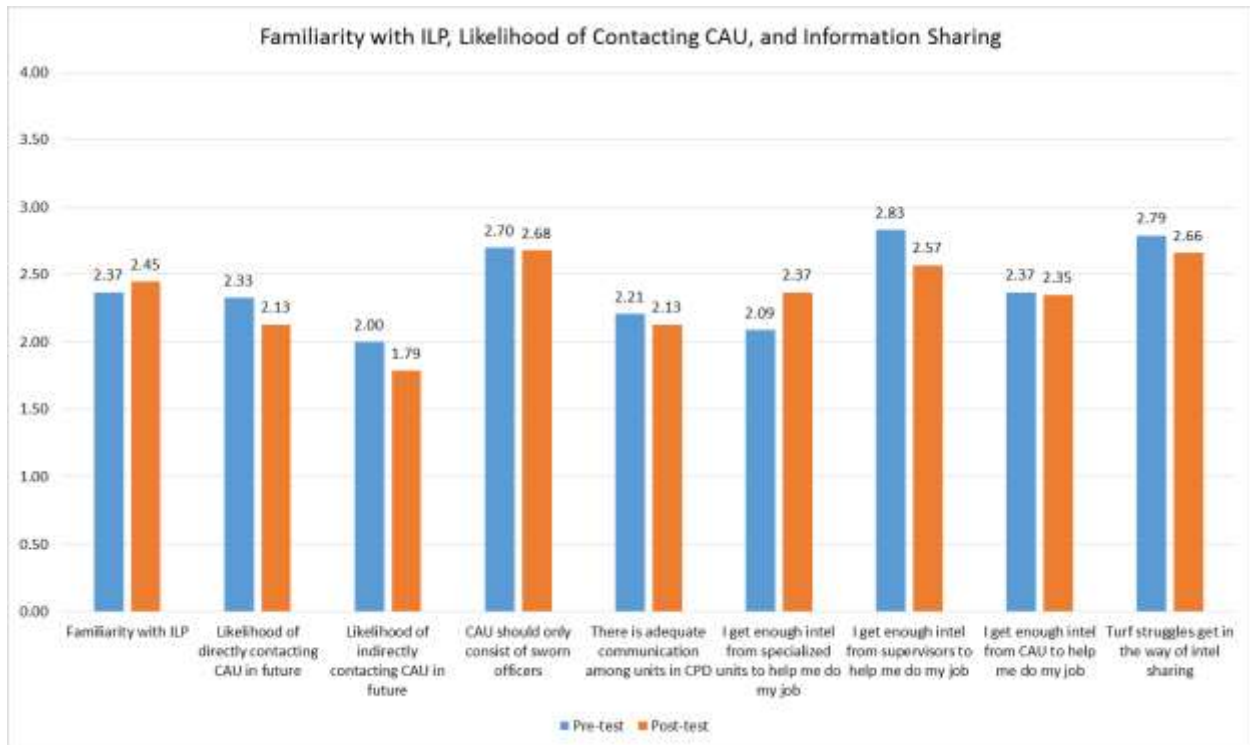
they are wrong, 73% think they should comply with officer requests even if they disagree. 78% believe officers can be trusted to make the right decisions for their community. Regarding satisfaction, although 54% of residents would like to see more officers in their neighborhoods, 82% either agreed or strongly agreed that CPD is doing a good job in their neighborhoods. The tables appended to this release provide the overall results of the survey.

This survey represents the first time the Columbia Police Department has attempted to empirically capture resident perceptions of crime and disorder and use this knowledge to inform department priorities and operations. These results are intended to guide the Smart Policing grant efforts as well as the overall deployment of department resources and activities. These efforts will be intended to reduce crime, improve citizen perceptions of their communities, and reduce fear of crime. In addition, the department would like to build on perceptions of the department and officers in order maintain a high level of trust and satisfaction with residents.

APPENDIX C:

Graphical Depictions of Officer Survey Pre- and Post-Test Evaluation Results

Familiarity with ILP, Likelihood of Contacting CAU, and Information Sharing

Awareness of and Attitudes toward CAU

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APPENDIX D

Recertification Presentation Slides

CPD SMART POLICING INITIATIVE

1. Review Smart Policing Initiative and Intelligence Led Policing
2. Discuss the efforts of the Crime/Intelligence Analysis Unit (CIAU) to analyze data and provide information to department personnel
3. What the CIAU needs from you

SMART POLICING PROGRAM

Initiative Goal: Demonstration project for showing how agencies can be effective, efficient, economical without significant changes in resources

Key elements of smart policing concept
- Police practitioner-researcher partnerships
- Intelligence-Led Policing
- Evidence-Based Policing

INTELLIGENCE-LED POLICING (ILP)

▪ Defined - a management approach that centers on the use of data analysis and criminal intelligence as "an objective, decision-making framework that facilitates crime and problem reduction, disruption and prevention through both strategic management and effective enforcement strategies that target prolific and serious offenders.

Definitional Elements

1. **Combines the use of crime analysis and criminal intelligence**
2. **Use of this combined analysis to objectively direct police resources**
3. **Crime and problem reduction through _disruption_ and _prevention_**
4. **Focuses enforcement activities on prolific and serious crime locations and offenders**

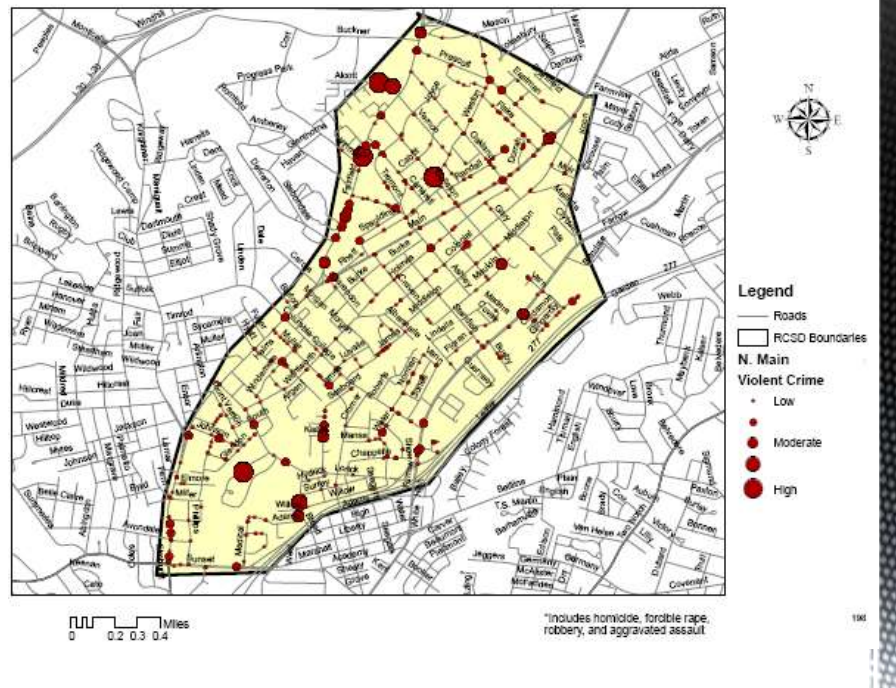*Key Requirement of ILP – patterns in crime, disorder and offending*

Ratcliffe (2008)

Criminogenic Places – Hot Spots

Sherman et al. (1989)

▪ Analysis of police calls for service in Minneapolis
  ▪ Examined dispersion for 323,979 CFS over 115,000 places in the city (addresses **and** intersections)

  ▪ Findings
    ▪ *3% of places in the city accounted for 50% of calls to police*
    ▪ Crime specific

N. Main Area Concentration of Violent Crimes* by Address (January 1, 2002-April 30, 2007)

*Includes homicide, forcible rape, robbery, and aggravated assault

Criminogenic Places – Hot Spots

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  - **Key issue – the location of crime often not random, specific places tend to be criminogenic**
    - ***Hot Spots*** - places with concentrated crime, disorder, and demands for police service

  Practical Implication – the identification and response to these high crime areas can have the greatest impact on an areas overall crime trend.
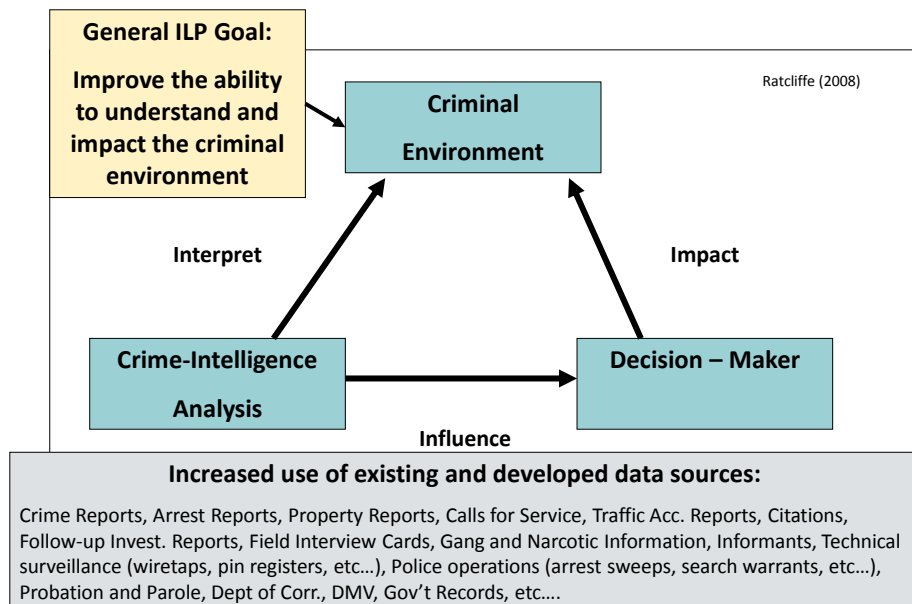
Prolific/Chronic Offenders Research

Wolfgang et al. (1972) Cohort Study

- Monitored the criminal careers of 9,945 boys born in Philadelphia in 1945

- Findings
  - ***6.3% of the group (627 boys) accounted for 51.9% crimes*** committed by the cohort by age 18.

  - More specifically
    - ***Same group accounted for 63% of index offenses***
    - 71% of homicides
    - 73% of rapes
    - 82% of robberies
    - 69% of aggravated Assaults

Individuals labeled *chronic offenders* = high frequency offenders

Intelligence-Led Policing (ILP)

General ILP Goal:

Improve the ability to understand and impact the criminal environment

Ratcliffe (2008)

Criminal Environment

Interpret

Impact

Crime-Intelligence Analysis

Decision – Maker

Influence

Increased use of existing and developed data sources:

Crime Reports, Arrest Reports, Property Reports, Calls for Service, Traffic Acc. Reports, Citations, Follow-up Invest. Reports, Field Interview Cards, Gang and Narcotic Information, Informants, Technical surveillance (wiretaps, pin registers, etc…), Police operations (arrest sweeps, search warrants, etc…), Probation and Parole, Dept of Corr., DMV, Gov't Records, etc….

Goals of the Smart Policing Initiative in CPD

A. *Improve the data collection/information about the criminal environment, and resulting analysis*

B. *Improve the communication of result intelligence, and the willingness of department members to utilize to inform activity*

Potential Limitations for Intelligence-Led Policing efforts

1. Segregated Knowledge Sources
   ▪ Information kept in officer's head
   ▪ Concerns over confidentiality
   ▪ Information utilized as power
2. Failure to document relevant information
   ▪ Inability for analysts to draw on during analysis efforts
3. Lack of interconnected databases
4. Ineffective and/or under-utilized intelligence products
5. Ineffective and/or under-utilized communication channels

Understanding Columbia's gang problem using social network analysis
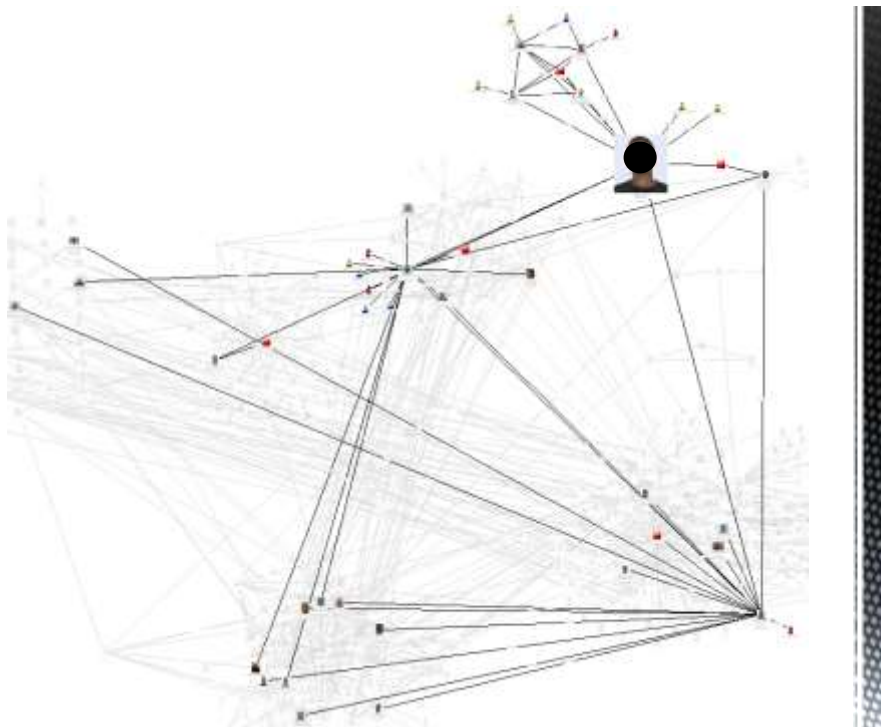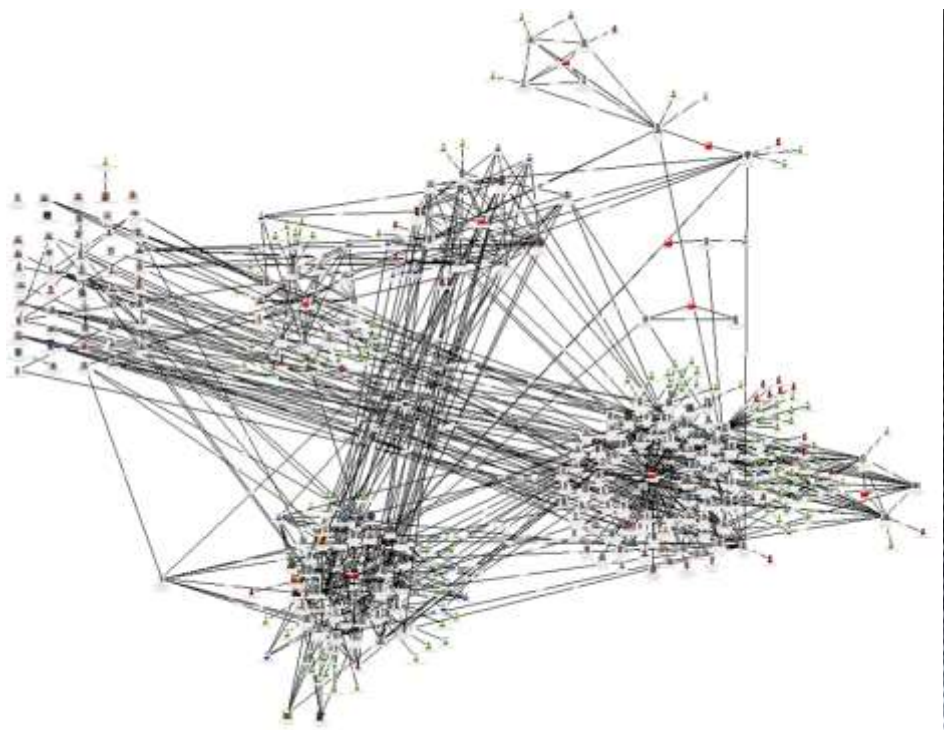
Repeat & Near-repeat Burglaries

▪ One of the most reliable predictors of *future* victimization is *past* victimization

▪ Research from England and Australia indicates that homes within 400 meters of an initial burglary are at an increased risk of being burglarized for a period of 4 weeks.
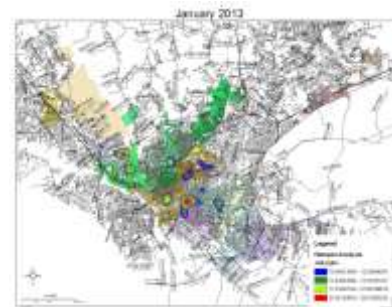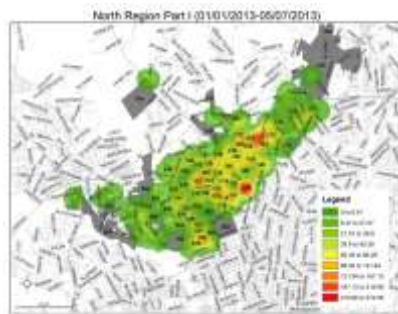
Frequency Distributions for North Region Locations Burglarized One or More Times, 12-1-12 - 9/15/13

# Times Address Burglarized	Number of Addresses	Percent of Addresses	Cumulative Percent of Addresses	Number of Burglaries	Percent of Burglaries	Cumulative Percent of Burglaries
1	641	83.7	83.7	641	63.4	63.4
2	86	11.2	94.9	172	17.0	80.4
3	25	3.3	98.2	75	7.4	87.8
4	3	0.4	98.6	12	1.2	89.0
5	3	0.4	99.0	15	1.5	90.5
6	1	0.1	99.1	6	0.6	91.1
8	3	0.4	99.5	24	2.4	93.5
9	1	0.1	99.6	9	0.9	94.4
17	1	0.1	99.7	17	1.7	96.1
18	1	0.1	99.9	18	1.8	97.9
22	1	0.1	100.0	22	2.2	100.0
Totals	766	100.0	---	1011	100.0	---

This suggests that by simply focusing on reducing *repeat burglaries*, North Region could potentially reduce *overall burglaries* by **nearly 37%.**

What CAIU can provide to Officers:

- Provide comparative analyses of crime trends to prepare from possible spikes that may be immanent.

- Maps, charts and other visuals to help identify problem areas and offenders

- Detailed Intelligence reports

What CAIU Needs from Officers:

- Use Intel Site INTERACTIVELY

- Feedback on whether the information provided was helpful, and other product/reports we could provide

- Complete Reports & ***Field Interview cards/reports*** with ALL information accurately:
  - Who/What/Why/When/Where/How Much

Contacts

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APPENDIX E

News Article Regarding CPD Burglary Prevention Efforts Consistent with Operation TAD

Columbia police take proactive approach to prevent burglaries

July 11, 2015 By **Allen Wallace**

A group of Columbia police officers spent part of Thursday afternoon walking through a local neighborhood in at attempt to stop crimes before they happen.

Columbia police officers spoke to residents near Melrose Park about burglary prevention. (photo by Allen Wallace)

Capt. Chris Roberts said two recent burglaries in the neighborhood near Melrose Park prompted the effort.

"It's important that once we see one or two, we take a proactive approach," he said.

Roberts and other officers went door to door in the neighborhood handing out flyers with burglary prevention tips and letting people know to call police any time they see or hear anything suspicious. Roberts said people always can and should call, even if they're not sure whether something odd is dangerous or criminal.

"Figuring out what it is is my job," he said.

Officers advised residents to take simple measures like locking doors and windows and closing curtains and leaving lights on when not home.

"The quicker we get the community engaged, the quicker we can get ahead of [criminal activities]," Roberts said.

One resident, who preferred not to be named, said he and his neighbors communicate regularly and watch each other's homes when someone is away. He told officers his block had not had a burglary in his memory, and officers said that community communication could very well be the reason for the block staying free of crime.

Anyone interested in receiving a brochure with burglary prevention tips may contact the Columbia Police Department here.

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