

THE KANSAS CITY FOOT PATROL PROJECT: AN EVALUATION OF THE  
EFFECTIVENESS OF FOOT PATROL IN VIOLENT CRIME MICRO-PLACES

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THE KANSAS CITY FOOT PATROL PROJECT: AN EVALUATION OF THE  
EFFECTIVENESS OF FOOT PATROL IN VIOLENT CRIME MICRO-PLACES

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ABSTRACT

The Kansas City Foot Patrol Project is a replication of the Philadelphia Foot Patrol Experiment (Ratcliffe et al. (2011)). The current study was conducted in Kansas City, Missouri and evaluated the effectiveness of foot patrol in violent crime micro-places. Specifically the goal of foot patrol was to reduce incidents of aggravated assaults and robberies in the micro-places. For a period of 90 days 8 pairs of rookie officers patrolled on foot in violent crime micro-places. The foot patrols operated Tuesday thru Saturday from August 1, 2011 to October 31, 2011. The number of reported aggravated assaults and robberies in four target areas were compared pretreatment, during treatment, and post treatment for within group variance. Repeated measures t-tests were conducted to determine the statistical significance of any observed differences in reported incidents. The current study found a significant reduction of targeted offenses in the target areas during treatment. During the first 6 weeks of treatment an especially significant reduction of reported aggravated assaults and robberies occurred. Then as treatment continued the reported incidents returned to pretreatment levels even while treatment continued. Policy implications and areas for future research are discussed.

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APPROVAL PAGE

The faculty listed below, appointed by the Dean of the College of Arts and Sciences have examined a thesis titled “The Kansas City Foot Patrol Project: An evaluation of the effectiveness of foot patrols in violent crime micro-places “presented by Christine Carr, candidate for the Master of Science degree, and certify that in their opinion it is worthy of acceptance.

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## CHAPTER 1

### INTRODUCTION

Police services can be delivered to the community through a variety of methods, one of which is foot patrol. Foot patrol brings the police out of their cars and onto the streets in order to interact with the public in a positive, and proactive manner, in addition to being an “intelligence gathering tool” (Sorg et al., 2013). Officers on foot are better able to communicate with the citizens due to their increased accessibility to the public. The increased accessibility is due to the barrier between the public and the police that the patrol car creates is removed. Barker (1999) suggested that foot patrol offers increased officer visibility and interaction with community members. This increased visibility and interaction provided the feeling that the police and community are partners in crime reduction. Foot patrols allowed officers to “encourage non-confrontational interactions between officers and citizens, which in part can improve communication and relationships, as well as aid in peacekeeping and service delivery” (Novak, 2013, p. 3925). As Wilson and Kelling (1982) indicated, if an officer is on foot, it is easier to talk to them without appearing to be a “fink” (p. 5)<sup>1</sup>.

”Foot patrol provides a fresh opportunity to demonstrate that the police are doing something about crime and disorder”, but cautioned that foot patrols prospects were “uncertain at best” (Greene, 1987, p. 13). Even with the uncertainty of foot patrol, police

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<sup>1</sup> Wilson and Kelling (1982) did not define fink; however, the term is similar to that of an informant or snitch.

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departments around the country continue to adopt the innovation of foot patrols as a method of administering policing services. A survey of local police departments in 2007 indicated that 55% of all police organizations utilized foot patrol regularly, and larger police departments tend to assign officers to foot patrol more frequently. The survey also found that 78% of cities of similar size to Kansas City (250,000-499,999) frequently implement foot patrol. Smaller cities use foot patrols less, 50% to 59% of police departments with a population of less than 250,000 reported using foot patrol on a regular basis (Reaves, 2010).

Though foot patrol has been widely used the actual full benefit of its implementation is not clear. Subjective measures of foot patrol such as citizen's fear of crime, and satisfaction with police services have widely been shown to be beneficial. However, objective measures of foot patrol, such as lowering violent crime rates, have not been found to be as effective (Greene, 1987; Police Foundation, 1981; Trojanowicz & Banas, 1985; Trojanowicz, 1982).

The purpose of this thesis is to examine the objective outcomes of foot patrol in Kansas City, Missouri in order to understand the impact this innovation has on crime. The present study is an evaluation of the Kansas City Missouri Police Department's Kansas City Foot Patrol Project's effectiveness in reducing violent crime in micro-places. The Kansas City Foot Patrol Project is a replication of the Philadelphia Foot Patrol Experiment. The Philadelphia Foot Patrol Experiment had been untested in other cities prior to the current study. The findings presented here will expound upon the existing literature base on the policing interventions of hot spot policing (a hot spot is identified as a cluster of addresses, streets, or blocks where crime is concentrated) and the use of foot patrols, specifically the effectiveness of foot patrols within violent crime hot spots. In addition to expanding the

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current literature base, this evaluation will inform other law enforcement agencies that are exploring crime reduction strategies on the validity of expending their dwindling resources on the intervention of foot patrols in violent crime micro-places.

The ensuing literature review will offer a comprehensive review of the existing literature base on both hot spot policing, and the use of foot patrols. Following the literature review, the methodology section will explain the analytical methods that were deployed to evaluate the Kansas City Foot Patrol Project. The results section will present the findings of the evaluation. Finally, the conclusion will provide an overview of the study, explore the policy implications of the evaluation, and offer recommendations for future studies.

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## CHAPTER 2

### LITERATURE REVIEW

This chapter will provide an overview of early foundational examinations of foot patrol conducted in the 1970s-1980s, by examining objective and subjective indicators of effectiveness. Next it will introduce hot spot policing and issues of crime displacement, discussing how this field of inquiry relates to foot patrol. Finally, this chapter will examine foot patrol, comparing and contrasting recent examinations with foundational projects.

#### **Police Effectiveness**

In judging law enforcement's performance, Bayley (1994) laid out three performance indicators; effectiveness, efficiency, and rectitude. The author operationalized these measures as "effectiveness is concerned with doing the right things, efficiency with doing things right, and rectitude with treating citizens right" (p. 79-80). This work will primarily focus on the performance indicator of effectiveness.

Traditionally policing services have been delivered through the use of routine motor patrols. The use of routine patrol by police has been considered to be an ineffective service delivery model which relies on a reactive approach of responding to crimes once they have occurred, instead of executing a proactive approach (Kelling et al. 1974). Additionally, routine motor patrol by officers in cars creates a barrier between the police and the public that they serve. In response to this, alternative methods of delivering police services have been attempted, including foot patrol.

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## **Foundations of Foot Patrol**

Two early comprehensive evaluations of foot patrols in communities, the Newark Foot Patrol Experiment and the Neighborhood Foot Patrol Program, found that citizen's fear of crime decreased, and interactions between citizens and police were more positive, but there was only a small reduction in violent crime (Police Foundation 1981; Trojanowicz 1982). A study of foot patrol in business areas by Esbensen (1987) found a crime reduction of disorder crimes, but no increase in citizen satisfaction. "Evaluations elsewhere demonstrated little-to-modest crime prevention benefit, which may have relegated foot patrol (as a strategy) as an add-on or supplement to real public safety interventions, or conceptualized it as a public-relations tool" (Novak, 2013, p. 3925).

An additional benefit to both police and citizens that foot patrol offers is the increased potential for mutually beneficial communication between police and the community. Wilson and Kelling (1982) discussed that it is less conspicuous for a citizen to speak with an officer on foot than an officer in a car. The casual appearance of the conversation allows for increased communication facilitating an information exchange without having the appearance of snitching. The increased accessibility and communication with the law abiding citizens that foot patrol fosters enhances the officers likelihood of gathering intelligence on problems within their foot patrol beat from community members.

### **Foundational Foot Patrol in the Community**

#### **Newark Foot Patrol Experiment**

The Newark Foot Patrol Experiment conducted by the Police Foundation (1981) began in February 1978 and continued to January 1979. The Newark Foot Patrol Experiment was a part of a larger study of foot patrol in 28 cities in New Jersey. The Newark Foot Patrol

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Experiment collected crime data for three different types of foot patrol across twelve beats. Four patrol beats increased foot patrol, four beats eliminated foot patrol, and four beats kept foot patrol at the same level. The foot beats were comprised of residences and businesses. Foot patrol was conducted five days a week during 1 shift per day. To analyze the crime data from the foot patrol treatment, time series statistical procedures were utilized. The results of the Newark Foot Patrol Experiment were discouraging. Once the data were analyzed, it was determined that the three types of foot patrol beats examined experienced no statistically significant differences in crime rates. The nonsignificant findings meant that increasing foot patrols had no effect on crime rates.

In addition to evaluating the Newark Foot Patrol Experiment on an objective measure, subjective measures were also examined. Perceptions of crime were measured using questionnaires. Police Foundation (1981) administered 2,400 questionnaires to people in residential and commercial areas who were in the each of the three foot beat areas. The residential and commercial questionnaire asked about perceived street traffic in their neighborhood, severity of crime-related problems in neighborhood, safety of neighborhood, victimizations, evaluation of police services, protective measures taken against crime, and likelihood of neighbors cooperating with police (Police Foundation, 1981). Residential and commercial respondents had differing perceptions.

Positive results were found with the residents who lived in the area which foot patrol had been added. The residents “indicated they perceived a marked improvement in their neighborhoods during the experimental period and a higher evaluation of police services” (Police Foundation, 1981, p.88) and reported they were “aware of levels of foot patrol” (Police Foundation, 1981, p.122). The residents in foot patrol areas reportedly felt safe, less

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likely to be victims of a crime and also reported taking fewer steps to protect themselves against crime.

In sharp contrast for the commercial respondents they indicated that the neighborhoods “had become worse” (Police Foundation, 1981, p.89) even in areas where foot patrols had been added, but lesser in the beats that dropped foot patrols. Commercial respondents also reported to be less aware of the foot patrols. Police Foundation (1981) concluded that foot patrol had effects on “citizen’s fear of crime, the protective measures they take to avoid crime, and the perceived safety of their neighborhoods” (p.124). Thus Police Foundation (1981) posited that the addition of foot patrol results in a reduction in fear of crime, and an increased sense of personal safety for residents.

In Police Foundation (1981) walk-alongs with the Newark officers on their foot beats observed the various ways in which the officers restored order, and how rules were established for acceptable behavior in the foot patrol neighborhoods. The less serious disorder crimes were found to be causing citizens to have a deficiency in their quality of life. However, when the foot patrols came in and restored order, the citizens felt safer and experienced a greater quality of life.

In addition to measuring the opinions of citizens subjective measures of officer’s attitudes and performance were also measured. The findings were that foot patrol officers were more likely than motor patrol officers to be satisfied with their jobs. Additionally, the study found that foot patrol officers “have a more benign view of citizens, a lower absenteeism record, and a more community-oriented view of the police function” (Police Foundation, 1981, p.109). The surveys revealed that foot patrol had positive effects for both citizens and officers.

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## **Neighborhood Foot Patrol Program**

The second foundational foot patrol evaluation was the Neighborhood Foot Patrol Program which had been conducted in Flint, Michigan. In Trojanowicz's (1982) evaluation, the author details how the Neighborhood Foot Patrol Program was created as a collaborative effort by the police department and the community that they protect and serve. The Neighborhood Foot Patrol Program began in January 1979 due to the lack of communication and interaction between citizens and the police, the lack of organization by neighborhoods, and their lack of proactivity in crime prevention. In order to improve communication, and interaction the police department sought citizen input as to where the foot patrols should be located, as well as input on the needs of the areas that citizen's felt needed to be addressed. Additionally, citizens made suggestions for the hours the foot patrol should operate and where the headquarters should be located. Fourteen target areas were identified for the experiment based on the series of meetings with citizens (Trojanowicz, 1982).

The Neighborhood Foot Patrol Program was evaluated based on 10 goals that were established; "decreasing crime, increasing citizens feeling of safety, deliver modern policing, create community awareness, develop citizen volunteers, eliminate citizen apathy in reporting crime, increase protection for women, elderly, and children, monitor foot patrol activities, measure interaction between police department and foot patrols, and evaluate training and performance of officer" (Trojanowicz, 1982, p. 11). A three-year comprehensive evaluation of the foot patrol program (1980 to 1982) was conducted with each of the ten goals being clearly operationalized as to how they were going to be evaluated. The evaluation examined the foot patrol program using subjective and objective measures including; several hundred personal interviews, analyzing crime statistics, monitoring the



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reports and routines of the foot patrol officers, and reviewing relevant media content (Trojanowicz, 1982). As a part of the evaluation, a routine was established for the foot patrol officers which encompassed everything from checking in, reviewing reports, walking their beat and their contacts with citizens. There were a total of four training sessions for foot patrol officers, an initial training and three follow-up trainings. The information obtained in the interviews with citizens and officers dictated the decision on the content of the training sessions.

The objective outcome of the Neighborhood Foot Patrol Program evaluation concluded that there was an 8.7% reduction of crime and a 43% decrease in calls for service during the three-year program's implementation in the foot patrol areas.<sup>2</sup> The subjective outcomes provided the most promising finding that "citizens believed that crime was down" and that "they attributed this decrease in crime to the existence of the Foot Patrol Program" (Trojanowicz, 1982, p. 86). An additional subjective finding was that 68% of the citizens interviewed reported that they felt safer because of the foot patrol program (Trojanowicz, 1982). It appears that citizen's perceptions towards crime, and feeling safer were benefits of the foot patrol program in Flint, Michigan. The subjective measures of citizen satisfaction and feeling safer were successful, but the objective measure of crime reduction was not.

### **Foundational Foot Patrol in Business Districts Esbensen (1987)**

Whereas the Newark Foot Patrol Experiment and Neighborhood Foot Patrol Program foot patrols focused mainly on the community, Esbensen (1987) evaluated a two-year foot patrol experiment in an unidentified southeastern city to determine if reported crimes were

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<sup>2</sup> Trojanowicz (1982) did not specify if these reductions were statistically significant.

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reduced in a business district. The foot patrols were initiated at the request of the city's Downtown Merchants' Association and were located solely in business districts. Esbensen (1987) examined both subjective and objective outcomes in the study. The objective outcome measure of reported offense data were analyzed to determine if reported crimes and disorder offenses, such as "vandalism, disorderly conduct, prostitution, drunkenness, and vagrancy" were reduced in the foot patrol areas (Esbensen, 1987, p. 53).

To gauge the subjective measure of attitudes towards police and how community/police relations were effected by foot patrols, businesses in the area of foot patrols, and a similar comparison business area that did not receive foot patrols, were interviewed four months after the study implementation and again two years later. The dependent variable of attitudes was measured on three scales measuring "police professionalism, support for police, and the nature of police/community relations" (Esbensen, 1987, p. 51). The sample sizes for the interview of the business were 135 in the treatment business areas and 132 in the comparison area.

The business district foot patrol experiment started March of 1983. There were foot patrol beats in two business districts of the city. Four officers were assigned to foot patrols which were deployed to three different beats each approximately five blocks in size, the fourth officer served as a "roustabout" (Esbensen, 1987, p. 49). The officers were assigned to foot patrol on a volunteer basis, but only veteran officers served on the newly formed foot patrols.

Prior to the commencement of their shifts each day, foot patrol officers met with their commander for 15 minutes. The schedule the foot patrol officers worked was 9 am to 6 pm to match the operational hours of the businesses they served. Foot patrol officers used

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preventative patrol because being noticeable was vital to their goal of having a deterrent effect on the disorder offenders.

Though the foot patrol experiment lasted two years, Esbensen (1987) selected only four months of crime data to utilize for analysis. The months were chosen starting in October 1982 and ending April 1985 using every third month. The months were selected as a control for seasonality effects. To measure the objective outcome of crime reduction Uniform Crime Data (UCR) data were used in the analysis.

Esbensen (1987) found that reported offenses of violent crimes were not reduced by the use of foot patrol; however, disorder offenses were reduced in the foot patrol areas. Displacement of disorder offenses was discovered in the areas surrounding the foot patrol beats. The displacement of disorder offenses was not equal though. Displacement occurs when crime or disorder is spatially displaced or relocated from the treatment areas to other nearby areas. For example over a three year period, disorder was reduced by 19% in the treatment area and disorder increased by 11% in the area surrounding the treatment area, therefore an 8% reduction in disorder overall was still achieved.<sup>3</sup> Due to the fact that foot patrol was initiated in business areas at the request of the merchants, the expectation of the businesses was a reduction in disorder offenses that would affect their business. The foot patrol targeted disorder offenses to make the area more attractive to shoppers.

The subjective outcome of the Esbensen (1987) business district study was more positive. Interviews of businesses revealed that 78% of the merchants found foot patrols to be more effective than traditional patrols in an initial interview and in a subsequent interview 86% more effective. Traditional patrols were not operationalized in this study so it is not

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<sup>3</sup> Esbensen (1987) did not specify if the results were statistically significant.

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specific as to if traditional patrols in this area were bicycle patrols or motor patrols. The analysis of the interviews revealed that between the two interview time points, responses changed very minimally and no relationship was found between the attitudes of those surveyed had towards police in general or towards foot patrol. Additionally, the positive results are diminished by the finding that there was not a statistically significant difference between the interview results of those in the treatment or control areas. Esbensen (1987) concluded that after the study “we are left with no clear cut answer as to whether or not foot patrols are of any value” (p. 60).

### **Limitations of Foundational Foot Patrol Studies**

A limitation to both the Newark Foot Patrol Experiment and Neighborhood Foot Patrol Program was that areas around the treatment foot patrol beats were not investigated to determine if a displacement of crime occurred, or if a diffusion of benefits occurred as a result of the foot patrols. Diffusion of benefits occurs when fewer crimes are committed in areas around the hot spot treatment area due to the treatment. Additionally, in the Neighborhood Foot Patrol Program study there were no comparison areas identified to be used for comparison to determine if crime went down because of foot patrol, or due to other factors. Displacement of crime and diffusion of benefits will be explored further later in this literature review.

Another limitation in the Neighborhood Foot Patrol Program study was the involvement of the community in the identification of areas to implement a foot patrol program. Although well-intentioned, the selection process was not necessarily evidence-based or data driven. Modern foot beats that are used to target violent crime are data driven and selected using violent crime incident data and geographic information systems (GIS).

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Though citizen concerns should be considered, and their input valued, selecting the times in which foot patrols operate is also methodologically best left to data driven decisions. Such as a temporal examination of crime patterns and trends to determine when crime occurs. Early foot patrol evaluations “did not utilize as rigorous research methodologies and stronger research strategies are necessary to inform best practices in police crime prevention strategies” (Novak, 2013, p. 3925). The use of data driven approaches allows for a more informed concentrated allocation of policing resources when and where they are most needed.

Another reason early foot patrol attempts did not demonstrate significant reductions in crime could be that once an officer is out of their car and patrolling on foot, what they do while providing the police service matters. Novak (2013) articulated that “increases in the mere presence of officers may yield modest crime prevention benefits; however there is evidence that when coupled with specific problem solving tactics, the impact may increase” (p. 3925). The foundational studies did not offer details as to what the officers did while on foot patrol.

The Neighborhood Foot Patrol Program may have also overlooked the value of other types of citizen concerns that may have been reduced. In their classic article, “Broken Windows”, Wilson and Kelling (1982) found that the citizens involved in the Neighborhood Foot Patrol Program were fearful of both crime and disorder. Wilson and Kelling (1982) further explained that the source of fear from disorder stemmed from “unpredictable people: panhandlers, drunks, addicts, rowdy teenagers, prostitutes, loiterers, the mentally disturbed” (p. 1). They found that “order maintenance” (p. 1) was achieved through the foot patrols with both the police and the citizens they served being satisfied.

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Esbensen (1987) also had limitations to the study. For example, the business areas that received foot patrol had five times the amount of businesses in their area than the comparison areas. The lack of equivalent composition of the treatment and control areas raises concerns, and suggests the control areas were not properly identified to be comparable.

Another challenge of Esbensen (1987) is that the study does not explain how large the police zone was that was used to measure displacement. Details are missing about how far from the foot patrol areas the zone covers, which would be used to know if the disorder moved from the foot patrol area due to the foot patrol, or if it was far from the treatment areas and could have been naturally occurring. This lack of the information provided brings into question if the crime was displaced by the treatment of foot patrol.

### **Foot Patrol: An officer's perspective**

In addition to evaluating the outcomes of foot patrol on the community, subsequent studies also evaluated how foot patrol affected the perceptions of the police delivering the foot patrol service. As an extension of the Neighborhood Foot Patrol Program in Flint, Michigan, Payne and Trojanowicz (1985) studied the subjective outcome of the performance profiles of foot versus motor officers from October 1983 and May 1984. They sampled 16 foot patrol officers and 16 motor officers, four officers of each patrol type were selected from four different sectors.

Payne and Trojanowicz (1985) stated that the role of the foot patrol officer was more social than that of the motor officer focusing on providing solutions to problems and connecting citizens to services they may need. Alternatively the role of motor officers alternatively was to “adhere to the narrowly oriented preventative strategy of crime control, reacting to events after they occur” (Payne & Trojanowicz, 1985, p. 5). An analysis of

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officer's daily report forms was conducted to examine their activities, and found that the foot patrol officers were involved in a more proactive way with the public than motor officers. It was determined that twice as many self-initiated investigations were conducted by foot patrol officers than motor officers, and foot patrol officers also exceeded in the category of service to the public by seven and a half times more than motor officers (Payne & Trojanowicz, 1985). In short, foot patrol officers were more proactive and engaged with the community than motor officers were.

In addition to making citizens feel safer, an added benefit of foot patrol is increased job satisfaction for officers. Trojanowicz and Banas (1985) compared the job satisfaction of foot patrol officers to motor patrol officers. In January and February of 1984, all 64 foot patrol officers and 50 motor officers were interviewed for comparison regarding their job satisfaction. A Likert scale was used to rank officer responses to various questions related to job satisfaction. The possible responses an officer could select for each question were "not at all, to some extent, or to a very great extent" (p. 5). Officers were asked if they were "doing an important job in the Flint Police Department, doing an important job in their patrol area, keeping up with problems in their patrol area, improving police/community relations, doing the job the police department sees as important, and working as part of a police team" (Trojanowicz & Banas, 1985, p. 5). Officers were also asked questions comparing foot patrol to motor patrol along with other questions gauging satisfaction.

After controlling for demographic differences, the researchers found motor officers were significantly more likely to report difficulty maintaining high morale and achieving job satisfaction" (Trojanowicz & Banas, 1985, p. 6). The researchers discovered that foot patrol officers were statistically significantly more likely to report they felt they were "doing an

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important job in the Flint Police Department, doing an important job in their patrol area, keeping up with problems in their patrol area, improving the police/community relations, doing the job the police department sees as important, and working as a part of a police team” compared to motor officers (Trojanowicz & Banas, 1985, p. 6).

Trojanowicz and Banas (1985) suggested that foot patrol officers experienced greater job satisfaction because “they viewed themselves as professionals” and they “fought crime and provided social services” (p. 6). A drawback to foot patrol over motor officers was expressed as meeting the higher expectations of the citizens due to their increased contact with community members. Foot patrol officers were more accountable to the citizens because of their close relationships. Foot patrol officers also reported “resistance” from motor officers and commanders (Trojanowicz & Banas, 1985, p. 8). Though there were drawbacks to foot patrol for the officers, their overwhelming response was positive, with foot patrol officers being more satisfied with their jobs than their motor patrol counterparts.

### **Hot Spot Policing**

The early forays into the use of foot patrol may have not resulted in the desired objective outcomes of a significant reduction of crime, but there could be a myriad of reasons for this outcome. The Newark Foot Patrol Experiment and Neighborhood Foot Patrol Program studies may have had officers on foot patrol in an area that was too large to be effective, thus creating a problem with limited treatment or dosage, resulting in an unintentional diluting of the benefits of foot patrol. Studies have found the size of a foot patrol beat should be small enough that it can be covered at least once or twice per shift to improve police community interactions and reduce fear of crime (Greene, 1987; Payne & Trojanowicz, 1985; Sherman, 1983). This is logical because the more a community sees the



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officer the safer they will feel knowing the officer is there. Additionally, as Sherman and Weisburd (1995) and Larson (1975) found, crime prevention and problem solving is more effective when it focuses on geographically small 'places'. Therefore, it is important to provide an overview of hot spot policing and how it relates to foot patrol.

Focusing on geographically small places is referred to as hot spot policing. A hot spot is identified as a cluster of addresses, streets, or blocks where crime is concentrated. Hot spots can be made up of one type of crime or a variety of crimes. Hot spots can be determined using a variety of data including; call for service data, arrest data, and offense report data (Braga, 2001). Modern technology such as geographic information systems (GIS) are often used to spatially identify where crimes have occurred to pinpoint a crime hot spot.

Increasing the police presence in a hot spot can have structural similarities to 'crackdowns' that emphasize enforcement. Scott (2003) explained that crackdowns are used to increase the visibility of police, and create a deterrent effect for potential offenders, not necessarily increased enforcement or sanctions. In the case of foot patrols in hot spots police are used to conduct highly visible patrols. Scott (2003) listed the Newark Foot Patrol Experiment as an example of a crackdown, due to the use of extra foot patrol officers.

Sherman (1990) concurred with Scott (2003) and emphasized that area based, such as hot spot, crackdowns "tend to emphasize presence" (p.8). Sherman (1990) explained that when crime is reduced after the commencement of a crackdown it is referred to as "initial deterrent effect" (p.9), and suggested that altering the risks of apprehension that offenders perceive through a crackdown can create short-term deterrence. A suggestion of Sherman's (1990) was to maximize on the "initial deterrent effect" (p.9) was to use a "continuous series

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of crackdowns with publicity, and backoffs with little or no publicity” (p.11). This method would increase the offender’s perceived apprehension risk.

Researchers have evaluated the use of hot spots, and in their study Sherman and Weisburd (1995) found that a “general deterrent effect of increases in police presence in crime hot spots” occurs which they call “micro-deterrence” (p. 645-646). The combination of hot spots and foot patrol is a natural pairing. The use of a community friendly intervention, such as officers on foot combined with the identification of a problem area, has the potential to provide citizens with the feeling of safety while deterring criminal activity. An officer on foot in a hot spot acts as a certainty communicating device. A criminally involved person may reconsider their criminal activities due to the officers’ presence, and thus be deterred.

Hot spot policing is a move forward in policing from traditional methods because the use of evidence or data to direct resources and make decisions is logical. As Taylor, Koper, and Woods (2011) stated hot spot policing allows the police to “concentrate their attention on the places where crime is most likely to occur” (p. 150). Having the capability to identify areas where crime occurs more often informs the decisions of where to allocate department resources by identifying patterns and trends of crime.

Policing scholar Lum (2013) touted the use of hot spot policing because of the predictable nature, they do not move unlike people, and the stability of hot spots over time. Lum (2013) posited “when you impact high crime hot spot areas, you can impact a whole city’s crime rate”. Koper (2013) added to this discussion by positing that hot spot policing can increase both police effectiveness and efficiency.

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## **Crime Displacement**

Though hot spots policing offers many benefits it is not without its critics. Rosenbaum (2006) is critical of hot spot policing because of the concern that crime will be moved from the treatment areas to other nearby areas, which is referred to as displacement. Weisburd and Braga (2006) detailed the results from nine hot spot studies and found minimal indications of displacement. Koper (2013) dismissed displacement effects by stating that in order for displacement to occur “offenders would have to find other places they’re comfortable going and committing their offenses”.

Braga (2001) evaluated nine hot spot studies and concluded, “focused crime prevention efforts do not inevitably lead to the displacement of crime problems” (p. 121). In actuality, some studies actually experienced a diffusion of benefits (less crime in areas around the hot spot treatment area). Weisburd et al. (2006) studied crime displacement in New Jersey and found that a more plausible outcome of place based crime interventions was a diffusion of benefits that is corroborated by other studies (Braga et al., 1999; Clarke and Weisburd, 1994; Hope, 1994; Sherman and Rogan, 1995).

## **Diffusion of Benefits**

Clarke and Weisburd (1994) operationalized diffusion of benefits as the “beneficial influence of an intervention beyond the places which are directly targeted, the individuals who are the subject of control, the crimes which are the focus of intervention or the time periods in which an intervention is brought” (p. 169). Clarke and Weisburd also expressed that failure to evaluate if diffusion of benefits occurs due to an intervention overlooks potential crime control benefits associated with the intervention. Omitting the consideration of diffusion of benefits from an evaluation has the potential to produce null results, when in

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fact the strategy did produce benefits, albeit unanticipated. Ratcliffe and Makkai (2004) described diffusion of benefits as “free policing” which they explain is “where gain is achieved in unexpected areas” (p. 1).

### **Hot Spot Policing and the Community**

Another critique of hot spots Rosenbaum (2006) offered is that police-community relations can be damaged from the innovation. Rosenbaum used the example of the aggressive strategy of zero tolerance policing to illustrate his point. However, hot spot policing is not the same as zero tolerance policing. A variety of interventions can be utilized in a hot spot, for example; broken windows policing, community policing, problem-oriented policing, and foot patrols to name a few. As Taylor, Koper, and Woods (2011) found “problem-solving, preventative strategies are more effective at hot spots than are enforcement-oriented strategies” (p. 153). Foot patrol would be an example of a problem-solving preventative strategy. Critiques are often aimed at how a policing innovation is practiced, rather than being opposed to the use of the innovation as a whole. How an innovation is executed, and how police interact with citizens’ matters. Both factors can affect how the community views the legitimacy of the police.

Though Rosenbaum is critical of hot spot policing, Rosenbaum (2006) acknowledged that “relying on information to make decisions about tactics, strategies, and programmatic interventions, assuming the data are accurate and complete, is preferred to cursing the dark or making decisions primarily on the basis of personal whim, personal experience, opinion of friends, or political pressure” (p. 146). The early Neighborhood Foot Patrol Program study, which allowed citizens to decide where foot patrols were going to be used, instead of identifying areas of high crime through the use of data driven methods, opened up the study

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to these very things Rosenbaum (2006) denounced, especially personal whim and political pressure.

The application of foot patrol in a targeted micro-place, such as a hot spot, could also improve how the performance of law enforcement is evaluated by the public they serve as set forth by Bayley (1994). The public that law enforcement is sworn to protect has expectations that foot patrol in micro-places would assist police in achieving. Foot patrol in micro-places would contribute to police effectiveness by providing citizens with a sense of safety. Even though early studies did not show a significant decrease in crime, they did express elevated feelings of safety in citizens.

Bayley's (1994) performance indicator efficiency can also be achieved through police focusing their limited resources in micro-places that have higher rates of crime, and direct the officer resources to those specific geographic areas, instead of randomly patrolling larger areas. Especially if the officer is on foot, then they are in the area that needs the focus, and they are ready to serve. Braga (2001) recommended that "police focus their actions on the places, times, and people who pose the highest risks to public safety rather than dilute their crime prevention potency by spreading them thinly across the urban landscape" (p. 105).

### **Modern Foot Patrol**

Though early studies suggested foot patrol offers limited crime curtailment benefits, two more recent studies offer a more optimistic view of the effectiveness of foot patrol in hot spots; Operation Impact and the Philadelphia Foot Patrol Experiment. This is perhaps because their implementation and evaluation overcame previous shortcomings. The two modern foot patrol studies were conducted by Piza and O'Hara (2012) that was conducted

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with the Newark Police Department, and Ratcliffe, Taniguchi, Groff, and Wood (2011) that was conducted with the Philadelphia Police Department.

### **Operation Impact**

Piza and O'Hara (2012) reported promising results from their foot patrol study in Newark, New Jersey. Newark's most recent foot patrol experiment called Operation Impact, launched in June 2008. During Operation Impact, six pairs of foot patrol officers, two sergeants, and one lieutenant patrolled one quarter-square mile foot beat nightly. The officers were recent graduates from the police academy, and the supervisors had been selected based on their proactive enforcement unit experience.

The foot patrol beat was identified using 36 months (January 2005 through December 2007) of weighted violent crime data. The types of violent crimes that were considered included reported robberies, aggravated assaults, non-fatal shootings, and murders. The methodology selected to weight the crime data is similar to that used in the Philadelphia Foot Patrol Experiment by Ratcliffe et al. (2011). The target area consisted of both residential and business land use.

The reported incident data provided for Piza and O'Hara's (2012) evaluation was obtained from the Newark Police Department. Though the foot patrol experiment occurred over the course of two years, for analysis purposes the data were considered for a time period of one year preceding the foot patrol treatment (June 4, 2007 to June 3, 2008), and one year of the treatment period (June 4, 2008 to June 3, 2009). This one year of treatment was selected because Operation Impact was at full force during this time period, as the experiment progressed budget cuts demanded a reduction of treatment dosage.

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The incident data were collected for four area types. The target area, which received the foot patrol treatment, an area surrounding the target area approximately one block in size, and two control areas. The placement of the area surrounding the target was strategic to include areas of concern, and exclude areas that were not of concern to the experiment. For example, a cemetery was excluded from the catchment area, and a housing complex that was more comparable to the target area was included. Both of the control areas were selected because of their similarities to the target area in crime and geographic layout. The method of policing that the foot patrol officers engaged in was operationalized as standard methods including “routine patrol, retrospective investigations, and ad hoc narcotics operations” (Piza & O’Hara, 2012, p. 9).

To determine the effect of foot patrol on crime, crime counts were compared pre and during foot patrol treatment for both the target and control areas. Crime displacement or diffusion of benefits was measured using a weighted displacement quotient (WDQ) calculator, which had been created by Ratcliffe and Breen (2008). Temporal displacement was also measured to determine if a crime reduction only occurred while the foot patrol was operational, from 6 pm to 2 am.

Piza and O’Hara (2012) found that all violent crime types were reduced during both the foot patrol dosage hours, and the hours in which no foot patrol was present, except for robbery in the target area. Robbery also showed a spatial displacement in their results. The overall violent crime reduction was found to be 30%, which was statistically significant. The authors suggested that the offenders were aware when and where the foot patrol officers would be, due to their set schedules making the foot beat predictable to potential offenders. The researchers recommended varying the times in which foot patrol is administered, and to

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move around the foot beats to numerous hot spots in order to keep the offenders from being cognitive of when police on a foot beat will be present. A limitation of this study, which the authors recognize, is that the pre-implementation and during foot patrol implementation were the only time periods evaluated for this study. Post intervention data were not provided or analyzed to detect if there were lasting effects from the foot patrol, or if crime returned to pre-foot patrol levels. A benefit to this study is that it considered temporal and spatial displacement to provide a more complete evaluation of the outcomes of Operation Impact. However, one limitation is it did not measure subjective outcomes.

### **Philadelphia Foot Patrol Experiment**

Another modern study of foot patrol being implemented in violent crime hot spots was Ratcliffe et al.'s (2011) evaluation of the Philadelphia Foot Patrol Experiment. In order to efficiently deploy foot patrol resources the Philadelphia Police Department identified small areas or micro-places with high levels of violent crimes (specifically robberies committed outside, homicides and aggravated assaults) using GIS. Thus the Philadelphia Foot Patrol Experiment studied both hot spot policing in collaboration with foot patrol. These foot beats were not hot spots in the pure definition of that term (see Sherman et al., 1989; Sherman & Weisburd, 1995); however they did represent small areas (or micro-places) that averaged about 14.7 intersections and 1.3 miles of surface streets. The dependent variable in the study was violent crimes, and the independent variable was whether or not the violent crime occurred in an area that was a control area that did not receive foot patrol, or a target area that received foot patrol. The initial Philadelphia Foot Patrol Experiment study only measured objective outcomes of the foot patrol experiment.



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The researchers used GIS to map the locations of violent crimes. One hundred and twenty potential treatment areas were selected by weighting violent crime in Philadelphia over a 3 year period, 2006-2008, with the most recent violent crimes being weighted higher than the older 2006 violent crimes. The areas were ranked 1 to 120 based on the weighted scores. The areas were coupled together by their rank for assignment to a target or control area to ensure the treatment and comparison areas were equivalent in their crime weight score. A quasi-random number generator was then used to assign 60 areas to the target area, which would receive the treatment (foot patrol), or assigned to the control area which would not receive the treatment.

According to Ratcliffe et al. (2011) the Philadelphia Police Department assigned pairs of rookie officers working consecutive shifts amid summer months, during which time officers engaged in a variety of activities from community-oriented work to aggressive enforcement. The officers worked in two shifts, a morning shift, 10 a.m. to 6 p. m. and an evening shift, 6 p. m. to 2 a.m. The foot patrols shifts were Tuesday through Saturday leaving Sunday's and Monday's without any treatment. There were two phases of foot patrol treatment. Phase 1 lasted 22 weeks beginning on March 31, 2009 and ending in September 2009. Phase 2 provided 12 weeks of treatment from July 7, 2009 to September 2009.

After the foot patrol treatment had been administered, GIS was utilized to map the violent crimes to determine in which area, target or control, a violent crime occurred. For the purpose of analysis, the pretreatment time period that was analyzed was the three months prior to the implementation of foot patrol treatment, and the time period in which the foot patrol treatment was being administered (March 31, 2009 to September 2009).

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Ratcliffe et al. (2011) found that the foot patrol experiment resulted in a 23% crime reduction in the target areas compared to the control areas. Crime displacement and diffusion of benefits were examined using approximately two blocks around the target and control areas as identified using GIS. A weighted displacement quotient (WDQ) calculator, which had been created by Ratcliffe and Breen (2008), was utilized to measure if a displacement of crime or diffusion of benefits occurred. Fewer violent crimes (90) occurred in the target areas that received the foot patrol treatment and 37 offenses occurred in the buffer area of the target areas which received the treatment. The foot patrol treatment, when taking into consideration the 37 offenses that occurred within a buffer (displacement) area, netted a reduction of 53 violent crimes. The study did not measure violent crimes that occurred in the control area buffers on the basis that if there was no treatment in the area, since it was a control area, then logically crime could not have been displaced by the treatment.

The study's findings were consistent with results from Evidence-Based Policing (EBP) studies, where Lum et al. (2011, p. 5) noted "police strategies are more effective when they are place-based, proactive and focused". Ratcliffe et al. (2011) noted these results indicate that "the Newark Foot Patrol Experiment and subsequent follow-up studies are not necessarily the last word on foot patrol effectiveness" and suggested that future inquiries into foot patrol "would be to develop in officers an appreciation for the merits of problem-solving/problem-oriented policing approaches that could leverage their local knowledge developed over months of foot patrol into a long-term problem reduction strategy" (p. 822).

### **Benefits of Modern Foot Patrol Studies over Foundational Studies**

Unlike the previously discussed foundational foot patrol studies, Ratcliffe et al. (2011) and Piza and O'Hara (2012) were able to utilize GIS to create their own micro-places

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for target and control areas. Being able to do so enabled them to evaluate the effectiveness of foot patrol in data driven violent crime hot spots. This technology allowed Philadelphia to spatially identify micro-places of high crime in which to implement foot patrol. The implementation of foot patrol in hot spots increased the officer's ability to be more visible, and to deter crimes from being committed.

The Philadelphia Foot Patrol Experiment proved foot patrol in micro-places to be a promising intervention, and was more methodologically rigorous than that of the Newark Foot Patrol Experiment or Neighborhood Foot Patrol Program studies. The Center for Evidence-Based Crime Policy's Policing Matrix, which was created by Lum, Koper, and Telep (2011), categorized studies based on several factors; whether the intervention is general or focused, the significance of the study, the level of proactivity, the scope of the target, and the methodological rigor of the study. For inclusion in the Matrix, a study must be at least methodologically moderately rigorous. Ratcliffe et al.'s (2011) Philadelphia Foot Patrol Experiment, which was focused in a micro-place, is classified in the Evidence-Based Policing Matrix as a statistically significant, methodologically very rigorous (the highest rigor rating), generally focused, and proactive randomized experiment.

The Philadelphia Foot Patrol Experiment's inclusion in the Evidence-Based Matrix solidified that the use of foot patrol in hot spots was an evidence-based practice. The success of the Philadelphia model, as outlined in the Evidence-Based Policing Matrix, justified the replication of the intervention by the current study. Utilizing the Evidence-Based Policing Matrix aids departments in focusing on "crime reduction not just crime reaction" (Lum, 2009, p.4).

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A benefit of being an evidence-based approach as Lum (2013) described, is that the use of evidence-based practices “can increase transparency and legitimacy” while providing Police Chiefs with “scientific justification” for their decisions. The use of evidence-based policing practices also aids police in fulfilling the performance measures that Bayley (1994) set forth. Utilizing evidence-based practices aid police in the effectiveness performance measure because they can be cost effective.

### **Philadelphia Foot Patrol Experiment Reexamined**

#### **Objective Outcomes**

Though the initial Philadelphia Foot Patrol Experiment by Ratcliffe et al. (2011) produced promising results, a limitation of the experiment was that the study only included crime data for the time period before the foot patrol treatment was implemented and the time period during which foot patrol was implemented; the post implementation time period was not considered. Subsequent to the original study, a follow up study by Sorg et al. (2013) was completed to evaluate the dependent variable, violent crime, for the time period after the foot patrol experiment to evaluate the impact of foot patrol posttreatment.

The follow up study by Sorg et al. (2013) reviewed data for an extended time period of one year prior to the implementation of foot patrol (instead of the three months pretreatment time period the initial study reviewed), the treatment period, and the three months following the treatment period. To analyze the foot patrol treatment under the expanded time period, the data were aggregated into biweekly time periods for each of the pre, during, and posttreatment time periods. Once the data were aggregated it was analyzed in three ways. The first was to revisit the benefit of foot patrol during the treatment period. The second analysis was to evaluate if the benefit of the treatment diminished during the

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experiment. Third the data were analyzed to determine if the treatment offered benefits after the foot patrol ceased.

After the first analysis Sorg et al. (2013) found that the foot patrol treatment did prevent crime during both phases of the foot patrol experiment. After the second analysis was complete it was determined that 1 of 2 foot patrol phases, phase 1 which spanned 22 weeks, experienced treatment decay over the course of the treatment period. The second phase, only 12 weeks, did not experience the same treatment decay. The final analysis revealed no post foot patrol treatment benefit was experienced. Sorg et al. (2013) also found after analyzing displacement effects that posttreatment the treatments areas experienced increased crime, but the areas around the treatment area experienced a crime reduction.

After the data were further evaluated, Sorg et al. (2013) concluded that foot patrols that lasted longer were not as efficient as a foot patrol which was implemented for a shorter time frame. The recommendation was made that the foot patrol officers should be rotated across different hot spots, instead of being in the same location on the same schedule, and this rotation could be beneficial in reducing the diminishing returns foot patrol experienced over time. Sorg et al. (2013) made this recommendation with the “Koper Curve” in mind. The “Koper Curve” is the commonly used name for the findings of Koper (1995). In his study Koper (1995) found that in order to have an increased deterrent effect, compared to simply driving through a hot spot, that a minimum of 10 minutes spent in a hot spot was required. However, the researcher discovered the “optimal length for police presence is about 14-15 minutes” and after that amount of time the police presence experiences “diminishing returns” (p. 668). The study also recommended to increase effectiveness of police in hot spots was to not only spend the optimal amount of time in a hot spot, but to also deliver the

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police presence on a “random and intermittent basis” (p. 668). Another recommendation that Sorg et al. (2013) made was that foot patrol could be used as a “mechanism to gather intelligence and direct enforcement at prolific offenders” (p. 92).

In a subsequent study to the initial Philadelphia Foot Patrol Experiment, Ratcliffe et al. (2012) evaluated the effectiveness of three different interventions; foot patrol, problem-solving, and an offender-based strategy in violent crime hot spots in Philadelphia. Violent crime data reported in 2009 were utilized to identify hot spots where the interventions could be implemented. Each of the intervention types had 27 hot spot areas identified. Random selection was used to select 20 areas for each intervention to receive increased police activity, and seven areas received standard poling. The experiment lasted from July 2010 thru February 2011. For the foot patrol, intervention pairs of volunteer officers walked the beat for 12 weeks. Officers were assigned to foot patrol duty in two ways; volunteer and selection by their supervisor. The shifts varied, but the treatment was typically applied five days a week for 8 hours a day. The offender based strategy involved identifying repeat violent offenders, and directing that information to command staff. The repeat violent offenders who were identified were then the subjects of targeted enforcement activities by a special unit (Offender Focus Team) who received their direction from a Captain. The problem-solving intervention was operationalized by district officers working with the community to address varied causes of violent crimes.

Changes in violent crime were measured in addition to controlling for seasonality effects. Ratcliffe et al. (2012) found that of the three interventions, only the offender-focused areas experienced a statistically significant violent crime reduction. The offender focused

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areas experienced a 22% reduction of all violent crimes was experienced in addition to a reduction in violent felonies of 31%.

Ratcliffe et al. (2012) identifies the factors that could have led to the null effects of foot patrol during this experiment. The first possibility was that during this treatment period of foot patrol there were half as many officers and one more beat of foot patrol than in the original study. Thus there were fewer resources spread over more space. The second possibility was that since in the first study rookie officers were used, and in the second experiment the use of existing officers instead of rookie officers could have led to less proactive policing efforts. The measure that was used to come to this conclusion was the number of pedestrian stops. In the original Philadelphia Foot Patrol Experiment pedestrian stops increased by 64% during foot patrol treatment, compared to in the more recent study only a 5% increase in pedestrian stops were conducted during foot patrol.

### **Subjective Outcomes**

In addition to the reexamination of the objective outcomes of the foot patrol experiment, the subsequent studies of the Philadelphia Foot Patrol Experiment also evaluated the subjective outcomes of the experiment. As a part of the analysis of the experiment community and Philadelphia Police Department, officers were surveyed pre-intervention and post-intervention as a part of the study. In addition, researchers from Temple University observed the interventions, and were involved in the implementation process.

The survey portion of Ratcliffe et al. (2012) found that levels of community satisfaction with the police, perceptions of property crime, perceptions of physical disorder, perceptions of social disorder, fear of crime, and perceptions of police legitimacy were not statistically significantly different pre intervention to post intervention. These results do not

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find that citizens were more satisfied with police, or less fearful of crime and disorder. However, it also negates arguments that policing in hot spots has a negative effect on the community's view of police.

The officer surveys were administered to various members of the police department and were not inclusive of those involved in the Ratcliffe et al. (2012) study. Of the 117 Philadelphia Police Officers surveyed 70% indicated that the community had more knowledge of what was occurring in their communities than the officers. Additionally 75% of officers agreed that “assisting citizens can be as important as enforcing the law” (p. 10). These results reflect an attitude of coproduction with the community, as well as an understanding that the community plays a vital role in crime reduction.

The Philadelphia Foot Patrol Experiment also spurred a study comparing foot and motor patrol officers. Groff et al. (2013) examined whether the Philadelphia Foot Patrol Experiment was successful because of foot patrol activities alone, or if foot patrol and car patrol worked together to reduce crime. Groff et al. (2013) found that foot and motor officers work together, but perform different duties. Foot patrol officers were found to have spent more time than motor officers on policing activities, such as addressing disorder and initiating pedestrian stops. Motor officers were found to respond to the reported crimes more than foot patrol officers. These results are to be expected, due to foot patrol officers being on the street making more contact with citizens, and motor officers responding to calls for service as a function of their policing directives.

### **The Current State of Foot Patrol Uncertainty**

The more recent citizen survey findings and updated crime reduction results add to the uncertainty of the benefits of foot patrol, specifically foot patrol in violent crime hot



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spots. This uncertainty deems the current study even more valuable in shedding light on what benefits foot patrol in micro-places renders. Table 1 presents an overview of relevant foot patrol studies.

Table 1 Foot Patrol Studies

<b>Foundational Foot Patrol Studies</b>	<b>Author</b>	<b>Site</b>	<b>Subjective Measure</b>	<b>Objective Measure</b>	<b>Measure Displacement</b>
The Newark Foot Patrol Experiment	Police Foundation (1981)	Newark, NJ	Fear of crime, Satisfaction, Officer performance and attitudes	Crime	No
Neighborhood Foot Patrol Program	Trojanowicz (1982)	Flint, MI	Citizen fear of crime, citizen satisfaction	Crime and calls for service	No
Foot Patrol: Of What Value	Esbensen (1987)	Unidentified Southeastern City	Attitudes towards police, community relations	Violent crime, disorder offenses	Yes- Spatial
<b>Modern Foot Patrol Studies</b>	<b>Author</b>	<b>Site</b>	<b>Subjective Measure</b>	<b>Objective Measure</b>	<b>Measure Displacement</b>
Philadelphia Foot Patrol Experiment	Ratcliffe et al. (2011)	Philadelphia, PA	Not measured in the initial study	Violent crimes	Yes -Spatial
Saturation Foot Patrol in a High-Violence Area	Piza and O'Hara (2012)	Newark, NJ	Not measured in the initial study	Violent crimes	Yes -Spatial and Temporal
Kansas City Foot Patrol Project <sup>4</sup>	Carr (2014)	Kansas City, MO	Not measured in the initial study	Violent crimes	Yes- Spatial

<sup>4</sup> It should be noted that the Kansas City Foot Patrol Project replicating the Philadelphia Foot Patrol Experiment's model was implemented prior to the follow up studies in Philadelphia and thus their findings and recommendations were not able to be considered.

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## Current Study

### The Kansas City Foot Patrol Project

Though there have been numerous examinations of foot patrols, much is still unknown. The success of the original Philadelphia Foot Patrol Experiment remains untested in different environments. Prior to the current study, scholars and police agencies were unsure whether the Philadelphia Foot Patrol Experiment model “travels” (Kennedy, 2011) or is generalizable across time or place. Prior research has concluded that foot patrol increases officer’s job satisfaction and performance, increased citizens feeling of safety, and reduced crime. The Kansas City Police Department in partnership with the University of Missouri-Kansas City research team conducted the Kansas City Foot Patrol Project as a replication of the Philadelphia Foot Patrol Experiment’s model.

The Kansas City Foot Patrol Project varied from the Philadelphia Foot Patrol Experiment in that the cities are different. Kansas City, Missouri is less dense than Philadelphia, Pennsylvania. Philadelphia has a population density nearly eight times greater than that of Kansas City. According to the 2010 United States Census, Philadelphia had a population of 1.5 million and a land area of 134 square miles, whereas Kansas City had a population of just under a half of a million and a land area of 315 square miles.

Evaluating the results of foot patrol in violent crime micro-places outside of Philadelphia will help confirm or contradict the policy relevance for other agencies in assessing whether foot patrol is right for their jurisdiction. As Eck (2010) explained, “Policy relevance is also about what works, where, when, and with whom” as well as “how does it work under different circumstances” (p. 865). The Kansas City Foot Patrol Project and the

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evaluation set forth will inform these important policy relevancy questions not only for Kansas City, but for other jurisdictions also exploring crime reduction strategies.

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## CHAPTER 3

### METHODOLOGY

This chapter discusses the methodology used in the current study. The methodology chapter includes information on the description of the treatment, how the treatment and control areas were selected, GIS preparation, hypotheses, the data that were used, dependent and independent variables, and the analytical strategy.

The Kansas City Foot Patrol Project is a replication of the Philadelphia Foot Patrol Experiment's model that utilized foot patrols in micro-places to reduce violent crimes, specifically aggravated assaults and robberies. According to the Kansas City Police Department's 2012 Annual Report, Kansas City, Missouri has a population of 459,787 citizens across 319 square miles, all of which are covered by the Kansas City Missouri Police Department. As of the 2010 U.S. Census Kansas City's population was broken down as follows: 59 % are Caucasian, 30% are African American, 10% Hispanic, 12% of households are single parents with children under age 18, and 18% of citizens are below the poverty line. The Kansas City Police Department employs over 1,400 sworn officers of which approximately 1,053 are assigned to the Patrol Bureau, which operates across six patrol divisions. The Patrol Bureau is responsible for general patrol functions, responding to calls for service, taking crime reports, enforcing traffic laws on the city's 5,282 miles of roadways, and investigating crime. The remaining officers are assigned to various other units within the

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police department outside of the Patrol Bureau, and serve in a wide variety of capacities unrelated to patrol.

The violent crimes that foot patrol specifically targeted, aggravated assault and robberies, are two areas of concern for Kansas City, Missouri. The aggravated assaults victimization rate in 210 was 741.9 per 100,000 people, and 336.8 per 100,000 people for robbery (Kansas City Missouri Police Department 2010 Annual Report). Violent crime in Kansas City tends to be concentrated in the East and Central Patrol Divisions. These two patrol divisions only account for 19% of the city's landmass and 29% of the population, yet consistently had the majority of the violent crimes from 2006 to 2009: 63.9% of the city's homicides, 64.5% of the city's robberies, and 60.5% of the aggravated assaults. (D. Lee, personal communication, April 21, 2011) Additionally, 67.3% of drive by shootings, and over half of all dispatched calls for service in Kansas City occurred in these areas (D. Lee, personal communication, April 21, 2011). Though crime is concentrated in Kansas City within the Central and East patrol division, crime is also further concentrated within those divisions as well. The geographic concentration of crime across micro-places within these patrol divisions renders an opportunity for proactive, focused problem solving to impact violent crime in an effective and efficient manner.

### **Selection of Treatment and Control Areas**

The areas which were identified by the Kansas City Police Department, and research staff, to serve as target and control areas for the foot patrol beats were selected based on weighted violent crime data. Weighted violent crime data from 2008-2010 city wide data were mapped by the Kansas City Police Department GIS Analyst. The GIS Analyst mapped offense and calls for service data for this time period which were used to identify 20 potential

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areas for foot patrol. The areas were composed of residences and businesses. Mapping parameters attempted to mirror Philadelphia whereas greater weight was given to more recent time periods, the total geographic areas would not exceed more than 1.5 linear miles of roadways, and to ensure that geographic areas did not overlap with each other. Sixteen of the twenty potential hot spot areas of the city were identified within the East and Central Patrol Divisions as expected. Each of these areas represented potential ‘foot beats’, and because they were organically estimated based on the above parameters, these foot beats did not necessarily coincide with standard patrol beats or sectors commonly used in the police department. Geographic dossiers were created for each of these 20 foot beat areas, including a detailed road map with boundaries, density maps using kernel density smoothing highlighted block-level offenses (i.e., aggravated assaults, aggravated assaults – domestic violence, aggravated assaults – drive by shootings, armed robberies, homicides and strong arm robberies), disaggregated violent and property crimes from the two previous years by hour of day, and calls for service for the previous two years by time of day.

These dossiers were shared with and reviewed by limited personnel during a planning meeting for target selection. In attendance at the target selection meeting were the Majors from the East and Central Patrol Divisions, the Major responsible for implementing the foot patrol project within the Patrol Bureau, the Deputy Chief of the Patrol Bureau, a Sergeant from Planning and Research, and two members of the university research team.<sup>5</sup> Each area was ranked from 1-20, whereas Area 1 had the highest overall crime rate and Area 20 had the lowest crime rate. Commanders and research staff scrutinized each of the twenty potential foot beat areas with the goal of narrowing it down to eight areas; this was due to their only

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<sup>5</sup> This planning meeting took place in a conference room where data were displayed on large overhead screens in addition to hard copies of each dossier.

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being sufficient resources to operate foot patrol in four target areas. From the eight areas four target areas were identified where foot patrol would be deployed, and four control areas were identified to compare against. Commanders stated their preferences for target areas based on crime data gathered as well as proximity to each other and land use (e.g., consideration was given to whether areas were primarily commercial, residential or mixed-land use). This process can be best described as data-driven, but also informed by local familiarity with the areas. The net result was a matched-pairs assignment to one of the experimental conditions where foot beat areas 1, 2, 4, and 7 were selected as target/treatment areas, and areas 3, 5, 6, and 8 were selected as comparison/control areas.<sup>6</sup> At the conclusion of the meeting, all materials on all foot beats were collected in an attempt to limit the identification of location of treatment and non-treatment areas within the police department. Commanders indicated that while those outside of the planning meeting may be aware of the existence of comparison areas, there would be no communication regarding exactly where those areas are located. Limiting who in the police department knew where the foot patrol control areas were located was vital to the integrity of the treatment.

Similar to the Philadelphia Foot Patrol Experiment, the Kansas City foot beats were defined as 1.3-1.5 miles of surface streets. Further catchment areas 650 feet (roughly two blocks) from the target and control areas were assigned to enable the research team to determine if displacement of crime occurred, or if diffusion of benefits resulted in the catchments. The use of catchment areas to examine if a displacement of crime or if a diffusion of benefits was experienced in the current study will overcome previously mentioned shortfalls of the foundational foot patrol studies. The catchment areas for each

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<sup>6</sup> See Appendix A for a map of Kansas City, Missouri which includes the target and control areas



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target and control area were numbered to reflect the corresponding area. For example, target area 1 corresponded to target catchment 1. While there is no standard perimeter to measure displacement, the current catchment zone is consistent with conventions and suggestions initially forwarded by Green (1995).

The catchment areas are a limitation this study faces due to the geographically close proximity of the violent crime micro-places identified for the study the catchment areas overlap with target and control areas in one instance thus creating “displacement contamination” (Bowers and Johnson, 2003, p. 278). In other words, the eight areas selected for target and control did not overlap, but due to the close geographic proximity of the areas an unavoidable, yet small, amount of overlap in the catchment areas did exist in a target and control area, as well as an overlap occurred in two of the target catchment areas. The overlap could result in a displacement of crime or a diffusion of benefits in the catchment; however this will be tested for.

### **Description of Treatment**

The Kansas City Foot Patrol Project utilized pairs of rookie officers for eight-hour foot patrol shifts. Pairs of rookie officers, who had recently completed their police academy training, and the break in period with a Field Training Officer, worked on two shifts per day. The foot patrol beats operated five days a week Tuesday thru Saturday. The hours in which foot patrol operated were from 10:00am to 11:00pm (two shifts overlapping in time). The officers performed 8,192 personnel hours of foot patrol over a 90-day treatment period from August 1, 2011 to October 31, 2011. Officers received a half-day of training on foot patrol from Philadelphia representatives in preparation for their foot patrol beats. The police response, foot patrol, will represent the treatment to be examined.

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## **GIS Preparation**

GIS was utilized to spatially analyze the offense data, which had been provided by the Kansas City Missouri Police Department, to determine where the offenses occurred. To spatially analyze the data all offenses that occurred between January 1, 2010 and July 31, 2012 were geocoded using the geographic mapping software ArcGIS 10 by the researcher. Esri defines geocoding as “the steps involved in translating an address entry, searching for the address in the reference data embedded in an address locator, and delivering the best candidate or candidates” (support.esri.com). A geocoded match rate of 98% was achieved for offense data. This indicated that 98% of all offenses were successfully geocoded, or address matched. There are many reasons why an address could be unmatched, for example an address could have been inaccurately recorded.

The geocoded offenses were then exported into an excel file and loaded into a SPSS file for analysis purposes. A map is included in Appendix A to visually illustrate the treatment and control areas, in addition to the catchment areas which served as areas to measure crime displacement or a diffusion of benefits. A GIS map demonstrating the geographic location of the offenses is not provided with this study due to the large number of offenses reported during the time period. The large number of offenses reported, over 80,000, rendered a visual display of these offenses not feasible for illustrative purposes.

## **Hypotheses**

To test the effectiveness of foot patrol in violent crime micro-places two hypothesis were tested.

H<sub>1</sub>: The mean number of reported aggravated assaults and robberies will decrease in the treatment areas between the time periods of pretreatment ( $t_0$ ) and the treatment period ( $t_1$ ).

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H<sub>2</sub>: The mean number of reported aggravated assaults and robberies will decrease in the target catchment areas between the time periods of pretreatment ( $t_0$ ) and the treatment period ( $t_1$ ).

### **Data**

To determine the impact of foot patrol in micro-places, the current study will be using violent offense data, specifically reported aggravated assault and robbery offenses. The data were extracted directly from the Kansas City Missouri Police Department records management system. There were 87,395 offenses reported to the Kansas City Police Department, but only the 3,776 aggravated assaults and 2,584 robberies were utilized for analysis. Of the total 6,360 reported aggravated assaults and robberies, 975 of those were reported in one of the study areas. Aggravated assaults and robberies were selected as the targeted violent crime offenses that would be the target of foot patrol in the spirit of replicating the Philadelphia Foot Patrol Experiment. As a result of utilizing data provided by the Kansas City Police Department, the study is limited to only examining incidents that were reported to the police, and not all incidents that occurred but were not reported.

A limitation with these data, like all official data, includes under-estimating the prevalence of any incidents that were not reported to police and thus will not be able to be considered in this study. Ratcliffe et al. (2011) also utilized reported incident data in their analysis, and in keeping with the spirit of replication; this study will do the same. However, there is no reason to believe under-reporting of offenses would be different across the target or control areas or across time; therefore this under-reporting is likely to be random error and thus make meaningful comparisons still possible.

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The unit of analysis for this study was micro-places (areas) as previously defined. There were four micro-place target areas and four micro-place control areas identified for the study. There were a total of four types of areas used for this study (treatment, control, treatment catchment, and control catchment), each area type was comprised of four areas, for a total of 16 areas. Thus for this study  $N = 16$  areas. The unit of analysis were selected in the spirit of replicating the Philadelphia Foot Patrol Experiment.

The data provided by the Kansas City Police Department consisted of 83 weeks of data including the time period of January 1, 2011 to July 31, 2012. These data contained information on the type of offense, date offense was reported, and address where the offense occurred, in addition to other information not included in these analyses. The addresses data were used to identify which of the aggravated assaults and robberies occurred in the 16 areas.<sup>7</sup> Data for the current study consists of crimes known to police for the 30 weeks before ( $t_0$ ) the treatment, the 13 weeks during ( $t_1$ ) treatment, and the 40 weeks posttreatment ( $t_2$ ).

Due to difference in the length of time across treatment periods, an average was created by summing the total number of aggravated assaults and robberies and dividing by the number of bi-weeks.<sup>8</sup> Each area was evaluated based on the same two week time dimension. Each biweekly time point consisted of fourteen days. There are forty two time

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<sup>7</sup> This method was discussed in greater detail in the GIS preparation section.

<sup>8</sup> Although crime rates are frequently used to control for differences in population, this strategy was not appropriate or possible. First, since this research is interested in looking at within-group differences across treatment periods, population level data is not important because it is the same population or micro-places being compared across all three time periods. Second, it was not possible to match the micro-places identified by the KCPD to any known population data. The census tract and block files were downloaded from the U.S. Census Bureau (2010) and spatially joined to the existing Kansas City Foot Patrol Project maps by the researcher using GIS. The researcher noted that due to the creation of the target and control areas as micro-places, they did not match up with census tracts or blocks. The target and control areas were both situated inside multiple census tracts and blocks and were located in very small portions of each tract and block. Since the target and control areas were hand drawn based on violent crime micro-places, they were not able to be matched to census tract or block data. Any use of census tract or block data to compare the areas would have been inaccurate. Previous foot patrol studies also excluded census tract data from their studies and the use of micro-places is a plausible explanation for the exclusion of such comparison data.

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points which start January 1, 2011 and end July 31, 2012. However, due to the fact that the last time point only included a time period of four days, for analysis purposes and to maintain consistency only forty one time points will be used.

There is a limitation to using the two week time periods, due to the construction of the two week time periods into 14 days each the implementation date and end dates of the treatment overlap at week 16 and week 22 with a few dates in which treatment was not provided. Week 16 includes the time period of July 30, 2011 to August 12, 2011. Since the treatment commenced on August 1, 2011 only two additional dates of data were included in this biweekly record. During the two days in which the treatment was in place only two aggravated assaults and robberies occurred in the analyzed areas, leading the researcher to believe the additional two days will not affect the outcome of the results. Week 22 included the time period of October 22, 2011 to November 4, 2011 and the treatment ended October 31, 2011, thus having an additional four days in the biweekly record during which the treatment was not in place. During the four days, only three aggravated assaults and robberies were reported in the analyzed areas.

### **Description of Dependent and Independent Variables**

The purpose of this study is to examine if foot patrol, the independent variable, exerted an effect on the mean number of aggravated assaults and robberies reported in micro-places, the dependent variable. More specifically, it is hypothesized that foot patrol will decrease the mean number of reported aggravated assaults and robberies in the target areas, compared to the number of targeted offenses prior to foot patrol being implemented in the target areas. In the spirit of replicating the Philadelphia Foot Patrol Experiment, attention was given to targeted violent offenses including aggravated assaults and robberies. The

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dependent variable is operationalized as the average number of aggravated assaults and robberies reported within each treatment areas across the three time periods; pretreatment ( $t_0$ ), during treatment ( $t_1$ ), and posttreatment ( $t_2$ ).

### **Analytic Strategy**

The hypotheses were tested using a paired-samples design, specifically repeated measured t-tests. Repeated measures t-tests were selected due to multiple measurements were taken on each area between three different time periods. In repeated measures tests “a pretest is given, some treatment is administered, and a post-test is given” (Spatz, 2008, p.199). To determine if there were significant reductions in the number of aggravated assaults and robberies, during the time periods of pre, during, and posttreatment, repeated measures t-tests were conducted using SPSS (Statistical Package for the Social Sciences).

In this study repeated measures t-tests were selected because the effectiveness of the treatment, foot patrol, was measured by comparing if the mean number of aggravated assaults and robberies were reduced across pretreatment, during treatment, and posttreatment periods within the target areas and target catchments. Additionally, the N was the same for each type of area. A directional hypothesis was utilized due to the researcher expected the treatment to reduce the number of reported aggravated assaults and robberies, based the on reduction found by Ratcliffe et al. (2011). A one-tail test was used for the hypotheses because the hypotheses were directional.

To run the initial repeated measures t-tests, the researcher used the grouping variable of areas by time period. The first group compared was pretreatment and during treatment, and the next during treatment and posttreatment within target areas. This same method was repeated for the second hypotheses being tested in order to determine if there was a

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significant decrease in the outcome measures within the target catchment areas. If the use of foot patrol in violent crime micro-places was effective in reducing reported aggravated assaults and robberies, the expectation would be to discover a statistically significant decrease in the number of reported aggravated assaults and robberies during the time period foot patrol was in place.

The researcher analyzed the generated output of each of the repeated measures t-tests. The mean, t value, and the significance levels were all examined. If the significance reported was  $p < .05$ , the amount of violent crime reduction in the two time periods could not be explained by chance alone. If the significance reported was  $p > .05$  the result could have been a reduction of incidents based on chance alone. The results of the repeated measures t-tests will be fully discussed in the results section.

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## CHAPTER 4

### RESULTS

This chapter will present the results of the study, including evidence of treatment integrity, results of the hypotheses testing, further analysis, and exploratory repeated measures t-tests.

#### **Treatment Integrity**

Prior to assessing the results of the outcome analysis it is important to examine treatment integrity. Treatment integrity is important because in order to determine if foot patrol reduced violent crime in micro-places, we first need to know that foot patrol was being executed in the target areas. While research staff could not directly observe all facets of the treatment, steps were taken to ensure program integrity. Though officers were not directed exactly what to do while on foot patrol, they were instructed that they should be spending the majority of their discretionary time within the boundaries of their assigned foot beats, and during this assignment they were not included in calls for service by central dispatch. Research staff conducted a series of ‘walk-a-longs’<sup>9</sup> with officers and it appeared the foot patrol officers stayed within the foot beat boundaries. Anecdotal information gathered from

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<sup>9</sup> Observers conducted walk-a-longs during the project period taking field notes on general activities; however, this was not coded in a systematic social observation forms. The observers engaged in different foot beats with different officers throughout the intervention. The primary purposes of the observations were to determine 1. Whether Officers were engaged in foot patrol and 2. Whether intervention was implemented in designated areas.



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officers during these observations also strongly suggests program integrity.<sup>10</sup> As noted, officers were rookies who were fresh off break-in (i.e., mandatory Field Training probation) and this project was their first official assignment. Officers remarked that they understood their assignments, and perhaps because they were not yet cynical (Niederhoffer 1970) indicated to observers that they ‘did what they were told’. Several officers lamented during walk-a-longs that they were not available for exciting calls for service, but noted that they had to ‘stay in their area’. Officers also commented they enjoyed the opportunity for being proactive while on foot patrol beats.

Additionally, as official data suggests officers were more active, available to citizens, and there was an increased dosage of police presence in the foot beats during the 90-day implementation period. An examination of the number of offenses, other than aggravated assaults and robberies, recorded during the implementation period revealed a significant increase in offenses in the treatment area for other offenses. Specifically, an average of 52.7 offenses were reported in the 2-week time period leading up to the implementation in the treatment area, but during the deployment of foot patrol the average number of recorded offenses spiked to 75.57. At the conclusion of the implementation, this rate dropped suddenly to 47.3 per two week time period. No such change in reported offenses was observed in the control areas (e.g., 36.8, 39.7 and 33.1). The increased police presence and availability to citizens, since they were on foot, in the treatment areas explains the increased reported offenses.

This change between pre-implementation and during foot patrol treatment is statistically significant, and is especially notable when considering the reported offenses,

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<sup>10</sup> The current researcher was not present for the walk-a-longs, therefore the walk-a-longs were not included as a part of the methodology.

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other than aggravated assaults and robberies, in the target and control catchment areas. In the target catchment area, an average of 55.9 offenses was reported prior to treatment, 65.7 during treatment and 49.7 posttreatment. The average number of reported offenses other than aggravated assaults and robberies in the control catchment mirror those reported in the control area (36.80, 39.71, and 33.16). Table 2 and Figures 1 and 2 below visually displays these data. Table 2 displays the average reported offenses, other than aggravated assaults and robberies.

Table 2 Average reported offenses other than aggravated assaults and robberies

Time Period	Target Area	Control Area	Target Catchment Area	Control Catchment Area
t <sub>0</sub> Prior to Treatment				
(January 1, 2011 to July 31, 2011-15 bi-weeks)	52.7	36.8	55.9	36.8
t <sub>1</sub> During Treatment				
(August 1, 2011 to October 31, 2011- 7 bi-weeks)	75.5*	39.7	65.7	39.7
t <sub>2</sub> Post Treatment				
(November 1, 2011 to July 31, 2012- 19 bi-weeks)	47.3	33.1	49.7	33.2

\*Significant at the p < .05 level

Figure 1 represents the biweekly number of all other reported offenses (other than aggravated assaults and robberies) in the treatment and control areas. The mean number of reported offenses (other than aggravated assaults and robberies) is clearly shown to increase

in the treatment areas at the start of implementation (bi-week 16), and then return to pre project levels. The control areas did not experience the same increase.

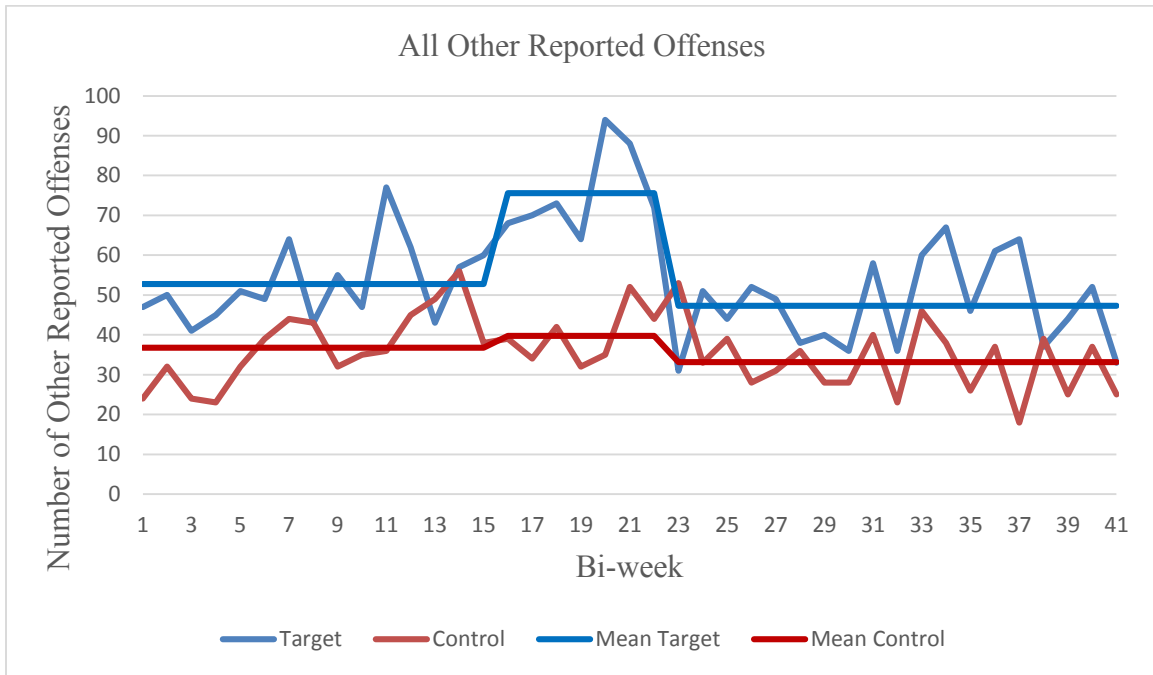


Figure 1. All other reported offenses in target and control areas.

Figure 2 represents the biweekly number of all other reported offenses (other than aggravated assaults and robberies) in the treatment catchment and control catchment areas. The mean number of reported offenses shows an increase (though non-statistically significant) at the start of implementation and then returns to pre project levels. The control catchment areas did not experience the same increase.

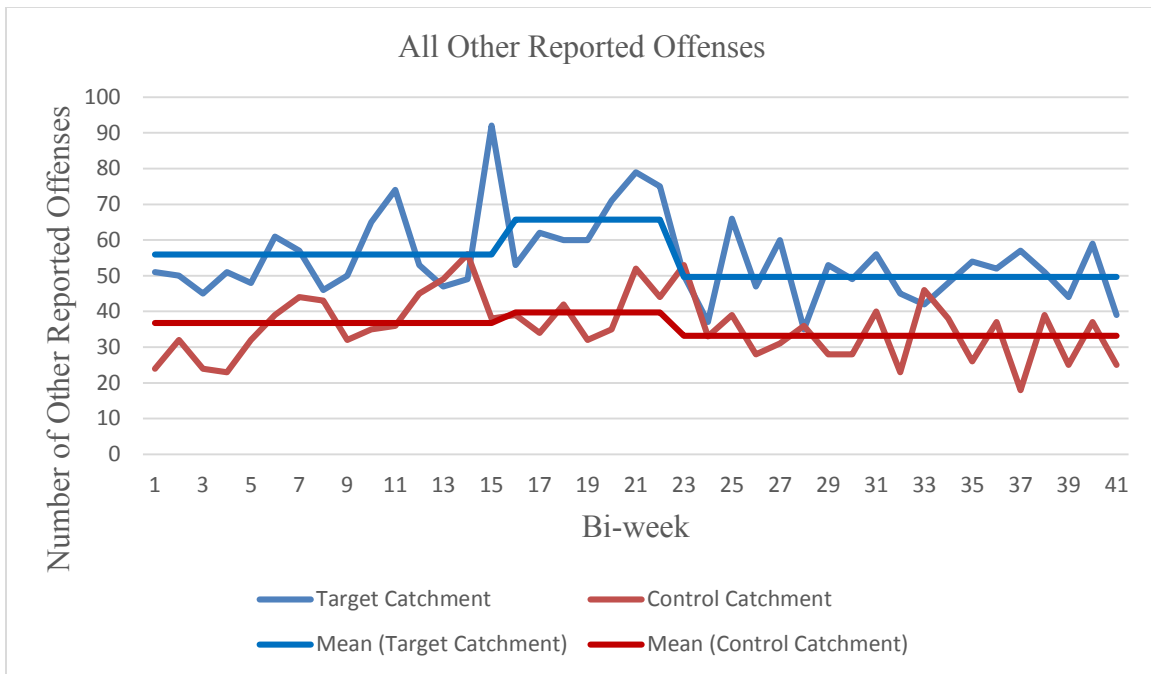


Figure 2. All other reported offenses in target catchment and control catchment areas.

There are three explanations for this observation of changes in offense reports (other than aggravated assaults and robberies) during and after implementation. The lesser plausible explanations are that the introduction of foot patrol increased crime, whereas the removal of foot patrol decreased criminal incidents. That is to say that increased police presence or guardianship made these micro-places more susceptible and attractive to motivated offenders, thereby increasing criminal opportunity. Another unlikely explanation is that since the police are present more crime was witnessed by the police and reported. These explanations seem unlikely, and are counter to the extant literature on foot patrol specifically, and similar micro-place crime prevention strategies generally.

A different and more likely interpretation is that increased officer presence, accessibility, and dosage caused an increase in reporting of existing crime, specifically minor offenses that may have come to the attention of the police that had previously gone

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undocumented were now being reported during the implementation phase. Trojanowicz (1982) posited that increased crime rates can be an indication of effective policing, and that when the crime rates rise it is an indication that more crimes are being reported. Trojanowicz (1982) elaborates by stating that when more crimes are reported that can be attributed to “a decrease in citizen apathy and greater citizen confidence in the police” (p. 28). This, coupled with the anecdotal information presented above appears to strongly suggest that officers were in fact implementing the tenants of the foot patrol project.

### **Initial repeated measures t-test results**

H<sub>1</sub>: The mean number of reported aggravated assaults and robberies will decrease in the treatment areas between the time periods of pretreatment (t<sub>0</sub>) and the treatment period (t<sub>1</sub>).

To test H<sub>1</sub> a repeated measures t-test was conducted to compare the mean number of reported aggravated assaults and robberies in the target areas during treatment to pretreatment (t<sub>1</sub> to t<sub>0</sub> see Model A). The results showed that a significant decrease occurred between t<sub>0</sub> (M=1.85, SD= .78) and t<sub>1</sub> (M=1.36, SD= .47);  $t(3) = -2.63, p < .05$  using a one-tail test. These results indicated that during the time period that foot patrol treatment (t<sub>1</sub>) was in place the mean number of aggravated assaults and robberies were reduced significantly compared to before foot patrol was implemented (t<sub>0</sub>). These results indicate that the use of foot patrol was effective in reducing violent crime in the target micro-places. To determine if the significant reduction of aggravated assaults and robberies that was experienced in the target areas caused a diffusion of benefits in the target catchment areas H<sub>2</sub> was tested.

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H<sub>2</sub>: The mean number of reported aggravated assaults and robberies will decrease in the target catchment areas between the time periods of pretreatment (t<sub>0</sub>) and the treatment period (t<sub>1</sub>).

A repeated measures t-test was conducted to compare the mean number of aggravated assaults and robberies in the target catchment areas during treatment to pretreatment (t<sub>1</sub> to t<sub>0</sub> see Model B). The repeated measures t-test failed to discover a statistically significant decrease between the mean number of reported aggravated assaults and robberies in the target catchment areas t<sub>1</sub> (M=1.75, SD= 1.47) and t<sub>0</sub> (M= 1.67, SD= .98)  $t(3) = .18, p > .05$  using a one-tail test.

These results reveal that a significant reduction of the mean number of reported aggravated assaults and robberies (diffusion of benefits) was not experienced in the target catchment areas. However, these results also revealed that crime displacement did not occur as an unintended consequence of foot patrol. The results for Models A and B are presented in Table 3.

Table 3 Initial repeated measures t-test results Model A and B mean number of aggravated assaults and robberies

Time Period	Target Area	Target Area Catchment
	Model A	Model B
t <sub>0</sub> Prior to Treatment		
(January 1, 2011 to July 29, 2011- 15 bi-weeks)	1.85	1.67
t <sub>1</sub> During Treatment		
(July 30, 2011 to November 4, 2011- 7 bi-weeks)	1.36	1.75
t-value	-2.63*	0.18
* Significant at the p < .05 level		
** Significant at the p < .01 level		

### Initial exploratory repeated measures t-test results

Exploratory repeated measures t-tests were conducted for target areas, control areas, target catchment areas, and control catchment areas across the time periods. The exploratory repeated measures t-tests were conducted using a two-tail test instead of a one-tail test due to the lack of a directional hypothesis. The purpose of these further tests were for the researcher to explore if any of the areas experienced a difference in the mean number of reported aggravated assaults and robberies across the time periods. The exploration would also uncover if the significant reduction experienced in the target areas during treatment were the



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only significant findings or if there were differences experienced during the time periods in other areas, as well as any differences in the target areas or target catchment areas during the other time periods.

The first exploratory repeated measures t-tests were run for the target areas and target catchment areas for the time period of posttreatment to during treatment ( $t_2$  to  $t_1$ ) to examine whether significant changes are observed between the specific periods. A repeated measures t-test was conducted to compare the mean number of aggravated assaults and robberies in the target areas during posttreatment to during treatment  $t_2$  to  $t_1$  (see Model C). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the target areas  $t_1$

( $M=1.36$ ,  $SD= .47$ ) and  $t_2$  ( $M= 2.01$ ,  $SD= .96$ )  $t(3) = 2.03$ ,  $p > .05$  using a two-tail test.

Although there was an overall increase in the mean number of reported aggravated assaults and robberies posttreatment, the results were not significant. This finding further solidifies that the treatment of foot patrol was the cause of the decrease in the mean number of reported aggravated assaults and robberies in the target areas during the treatment period.

Additionally, these results reveal that the crime reduction benefit decayed after the foot patrol treatment ended in the target micro-places.

A repeated measures t-test was next conducted to compare the mean number of aggravated assaults and robberies in the target catchment areas during posttreatment to during treatment ( $t_2$  to  $t_1$  see Model D). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the target catchment areas  $t_1$  ( $M=1.75$ ,  $SD= 1.46$ ) and  $t_2$  ( $M= 1.32$ ,  $SD= .52$ )  $t(3) = -.86$ ,  $p > .05$  using a two-tail test. These results reveal that a significant difference in

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the mean number of reported aggravated assaults and robberies was not experienced in the target catchment areas during this time.

Next exploratory repeated measures t-tests were run for the control areas and control catchment areas. This is important in that it permits comparison between the treatment and the control areas and provides greater clarity whether any changes in the treatment area were also occurring in other areas not receiving the foot patrol treatment. First a repeated measures t-test was conducted to compare the mean number of aggravated assaults and robberies in the control areas during treatment to pretreatment ( $t_1$  to  $t_0$  see Model E). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the control areas  $t_0$  ( $M=1.61$ ,  $SD= .47$ ) and  $t_1$  ( $M= 1.67$ ,  $SD= .89$ )  $t(3) = .24$ ,  $p > .05$  using a two-tail test.

Next using a two-tail test a repeated measures t-test was conducted to compare the mean number of aggravated assaults and robberies in the control areas posttreatment to during treatment ( $t_2$  to  $t_1$  see Model F). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the control areas  $t_2$  ( $M=1.64$ ,  $SD= .77$ ) and  $t_1$  ( $M= 1.67$ ,  $SD= .89$ )  $t(3) = -.09$ ,  $p > .05$ .

The results of the repeated measures t-tests (Models C thru F) revealed that there was no difference in the mean number of reported aggravated assaults and robberies during the time periods. These findings support that foot patrol was the cause of the decrease in the reported mean number of reported aggravated assaults and robberies during the time foot patrol was in place in the target areas.

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Any differences in the mean number of reported targeted offenses in the control catchment areas was tested for next. The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the control catchment areas during treatment and pretreatment  $t_0$  ( $M=.848$ ,  $SD= 1.36$ ) and  $t_1$  ( $M= 1.36$ ,  $SD= .82$ )  $t(3) = 2.65$ ,  $p > .05$  (see Model G).

Finally a repeated measures t-test was conducted to compare the mean number of aggravated assaults and robberies in the control catchment areas posttreatment to during treatment ( $t_2$  to  $t_1$  see Model H). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the control areas  $t_1$  ( $M= -1.36$ ,  $SD= .82$ ) and  $t_2$  ( $M= 1.02$ ,  $SD= .74$ )  $t(3) = -.978$ ,  $p > .05$  using a two-tail test.

The results of the repeated measures t-tests revealed that there were no differences in the mean number of reported aggravated assaults and robberies during the time periods in the control catchment areas. These results are to be expected due to the absence of treatment in the control areas does not lend to the existence of a diffusion of benefits or to the potential of crime displacement in the catchment areas. None of the exploratory repeated measures t-tests revealed any significant results, hence detecting no significant threats of displacement. Table 4 details the average mean number of reported aggravated assaults and robberies in each of the areas during each of the time periods for Models C, D, E, F, G, and H.

Table 4 Initial repeated measures t-test results Models C, D, E, F, G, and H mean number of aggravated assaults and robberies

Time Period	Target Area	Target Catchment Area	Control Area	Control Area	Control Catchment Area	Control Catchment Area
	Model C	Model D	Model E	Model F	Model G	Model H
t <sub>0</sub> Prior to Treatment						
(January 1, 2011 to July 29, 2011- 15 bi-weeks)			1.61		0.84	
t <sub>1</sub> During Treatment						
(July 30, 2011 to November 4, 2011-7 bi-weeks)	1.36	1.75	1.67	1.67	1.36	1.36
t <sub>2</sub> Post Treatment						
(November 5, 2011 to July 27, 2012- 19 bi-weeks)	2.01	1.32		1.64		1.02
t-value	2.03	-0.86	0.24	-0.09	2.65	-0.97
* Significant at the p < .05 level						
** Significant at the p < .01 level						

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### **Further analysis**

After running the repeated measures t-tests the researcher visually evaluated the data by creating a graph of the number and mean number of aggravated assaults and robberies in the target and control areas using all bi-weeks. Upon post hoc review of the graphically displayed data a sharp dip in the average number of reported aggravated assaults and robberies at the implementation of the treatment, bi-week 16, was observed followed by a rise in reports. The results are graphically displayed in Figures 3 and 4 below.

Figure 3 displays the reported aggravated assaults and robberies viewing the entire 41 bi-week time period showing the dip in reported incidents at bi-week 16. Figure 4 shows a view of bi-weeks 14-24 offering a closer examination of the treatment period, bi-weeks 16-22. This is suggestive of an initial deterrence effect on aggravated assaults and robberies during the treatment phase within foot beat areas, which would be consistent with Sherman's (1990) and Scott's (2003) observations on the influence of crack downs on serious criminal activity. Due to the fact that this initial visual inspection is suggestive of the phenomena noted in the extant literature additional examinations were conducted to further examine whether the implementation of foot patrol had a deterrent effect at the initial stages of treatment that may have dissipated even while the treatment was ongoing.

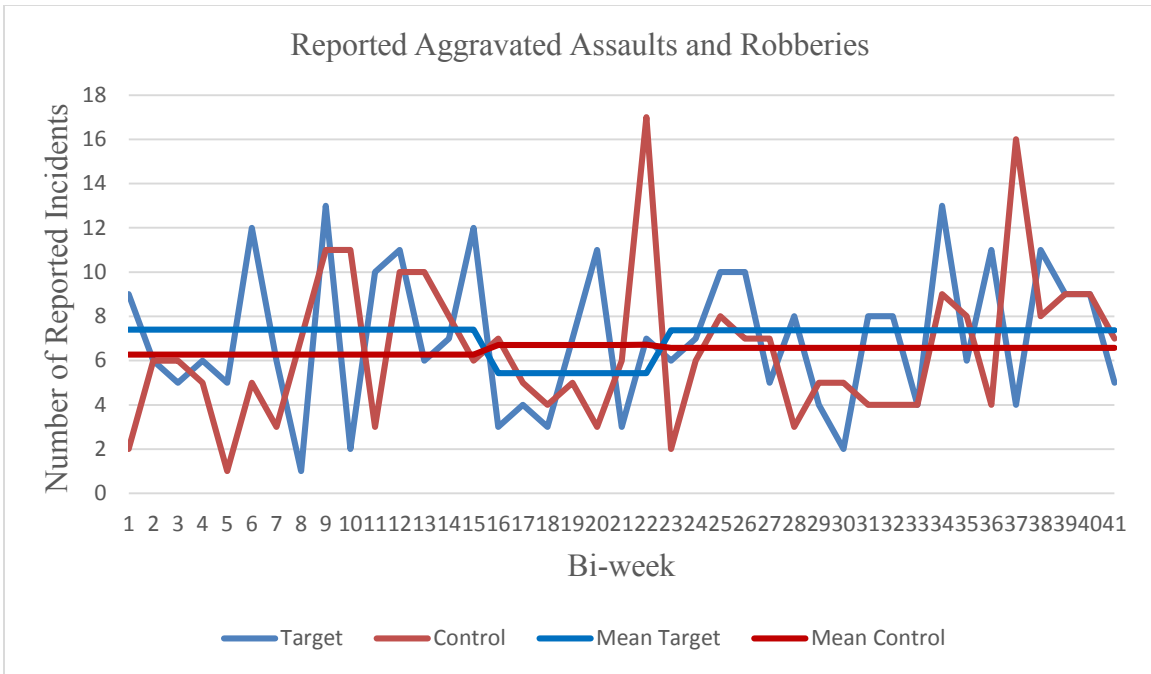


Figure 3. Reported Aggravated Assaults and Robberies in Target and Control Areas.

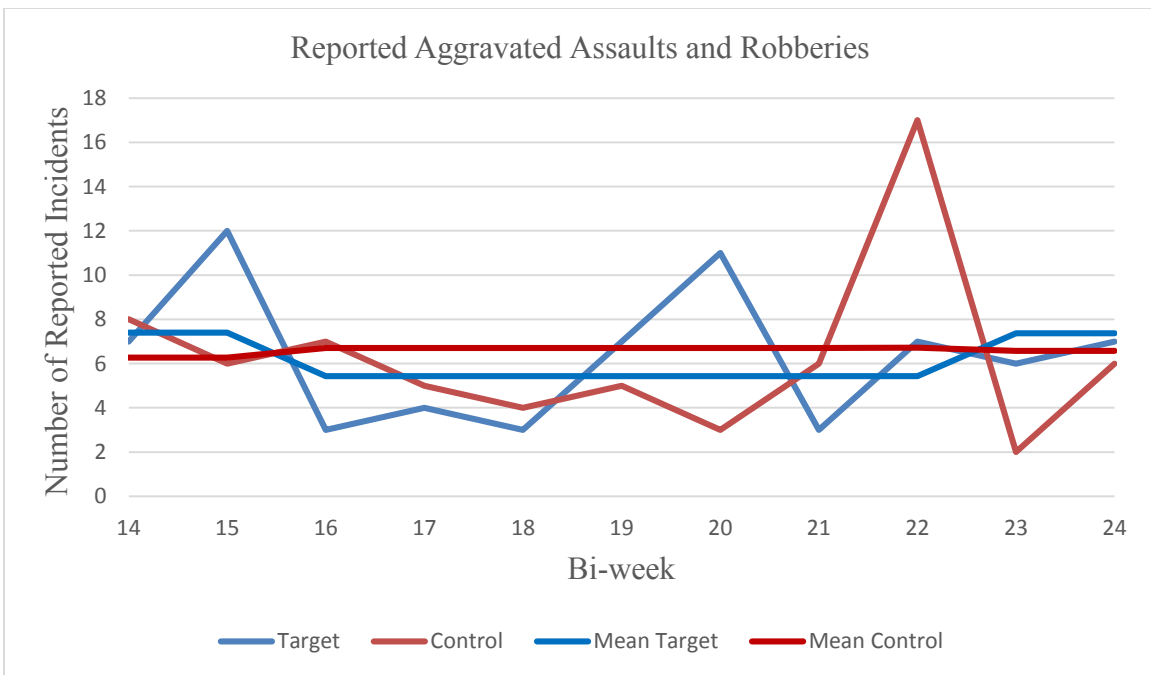


Figure 4. Reported Aggravated Assaults and Robberies in Target and Control Areas Bi-week 14-24.

To accomplish this the researcher re-estimated the data using a split treatment period. The treatment period bi-weeks 16 to 22 were split into two new time periods for analysis. Bi-weeks 16-18 became early treatment and bi-weeks 19-22 became late treatment. The results are graphically displayed in Figures 5 and 6 below. Figure 5 displays the average reported aggravated assaults and robberies viewing the entire 41 bi-week time period. The dip in reported incidents during the time period of early in treatment, bi-weeks 16-18, can be further observed in this representation. Figure 6 shows a view of the mean reported aggravated assaults and robberies for bi-weeks 14-24 offering a closer examination of the treatment period, bi-weeks 16-22. This representation provides a closer examination of the early and late treatment periods. There is a sharp decrease in incidents that is followed by a rise in reported incidents at bi-week 18.

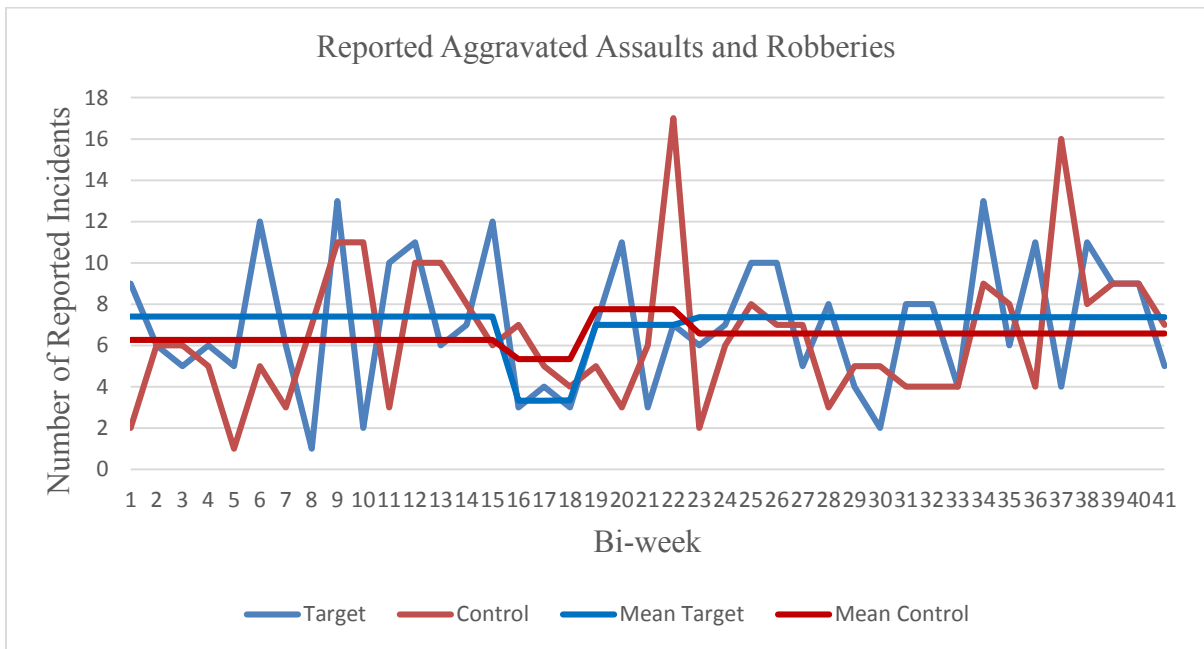


Figure 5. Reported Aggravated Assaults and Robberies in Target and Control Areas with Split Treatment Periods.

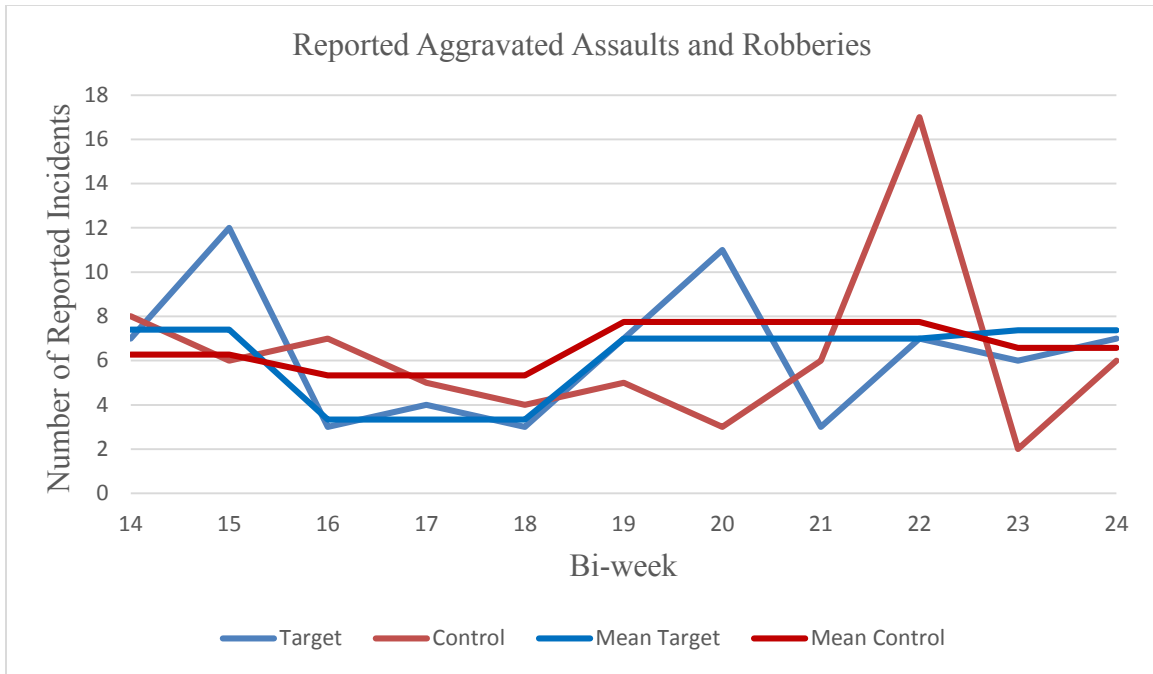


Figure 6. Average Reported Aggravated Assaults and Robberies in Target and Control Areas with Split Treatment Periods.

This analysis reveals that the first six weeks of the treatment (bi-weeks 16-18) experienced a sharp reduction in the average reported aggravated assaults and robberies followed by an uptick in reports after bi-week 18. After reviewing the results of the split treatment analysis in a visual graphical representation the researcher decided to reevaluate the data in SPSS based on two new variables representing the split treatment time periods. The two new time periods split the existing time period of during treatment into early during treatment, which included bi-weeks 16-18, and late during treatment, which included bi-weeks 19-23.

#### **Further repeated measures t-test examinations**

Repeated measures t-tests using a two-tail test were conducted to analyze the data using the new time periods. First the target and control areas were evaluated using the new time periods. The results for the further repeated measures t-tests are displayed in Table 5.



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Following the analysis of the target and control areas the catchments areas for target and control were evaluated. The results of the further repeated measures t-tests are displayed in Table 6.

A repeated measures t-test was conducted to compare the mean number of reported aggravated assaults and robberies in the target areas early during treatment to pretreatment ( $t_{1a}$  to  $t_0$  see Model I). The results showed that a significant difference occurred between  $t_{1a}$  ( $M=.833$ ,  $SD=.64$ ) and  $t_0$  ( $M=1.85$ ,  $SD=.78$ );  $t(3) = -4.61$ ,  $p = .01$  using a two-tail test. These results indicated that during the early time period that foot patrol treatment ( $t_{1a}$ ) was in place the mean number of aggravated assaults and robberies were reduced significantly at the  $p = .01$  level, compared to before foot patrol was implemented ( $t_0$ ). Significance at the .01 level indicated that there is a 99% chance that the decrease in reported aggravated assaults and robberies was experienced during the first six weeks of the treatment period due to foot patrol. These results further confirm that the use of foot patrol was effective in reducing violent crime in the target micro-places.

Next a repeated measures t-test was conducted to compare the mean number of reported aggravated assaults and robberies in the target areas late during treatment to early during treatment ( $t_{1b}$  to  $t_{1a}$  see Model J). The repeated measures t-test discovered a statistically significant difference between the mean number of reported aggravated assaults and robberies in the target areas  $t_{1b}$  ( $M=1.75$ ,  $SD=.45$ ) and  $t_{1a}$  ( $M=.833$ ,  $SD=.64$ )  $t(3) = 3.43$ ,  $p < .05$  using a two-tail test. These results indicate that the mean number of reported aggravated assaults and robberies increased between the early treatment period and the late treatment period. These results are consistent with the analysis of the graphical display of the data splitting the treatment period into two time periods, early and late.

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Finally a repeated measures t-test was conducted to compare the mean number of aggravated assaults and robberies in the target areas posttreatment to late during treatment  $t_2$  (to  $t_{1b}$  see Model K). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the target areas  $t_2$  ( $M= 2.01$ ,  $SD= .96$ ) and  $t_{1b}$  ( $M= 1.75$ ,  $SD= .45$ )  $t(3) = .881$ ,  $p > .05$  using a two-tail test. These results indicate that even though there was an increase in the mean number of reported targeted offenses, it was not significant between the time periods of late treatment and posttreatment.

Following the reevaluation of the target areas, the control areas were reevaluated using the same time periods. A repeated measures t-test was conducted to compare the mean number of reported aggravated assaults and robberies in the control areas early during treatment to pretreatment ( $t_{1a}$  to  $t_0$  see Model L). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the control areas  $t_{1a}$  ( $M=1.35$ ,  $SD= 1.05$ ) and  $t_0$  ( $M= 1.61$ ,  $SD= .47$ )  $t(3) = -.924$ ,  $p < .05$  using a two-tail test.

Next a repeated measures t-test was conducted to compare the mean number of reported aggravated assaults and robberies in the control areas late during treatment to early during treatment ( $t_{1b}$  to  $t_{1a}$  see Model M). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the control areas  $t_{1b}$  ( $M=1.93$ ,  $SD= .89$ ) and  $t_{1a}$  ( $M= 1.33$ ,  $SD= .1.05$ )  $t(3) = 1.57$ ,  $p < .05$  using a two-tail test.

Finally a repeated measures t-test was conducted to compare the mean number of reported aggravated assaults and robberies in the control areas posttreatment to late during

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treatment ( $t_2$  to  $t_{1b}$  see Model N). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the control areas  $t_2$  ( $M=1.63$ ,  $SD= .77$ ) and  $t_{1b}$  ( $M=1.93$ ,  $SD= .89$ )  $t(3) = -.65$ ,  $p < .05$  using a two-tail test. None of the revaluations of the control areas using the new split time periods revealed statistically significant differences.

These results further confirm that the treatment that was deployed in the target areas, foot patrol, was responsible for the reduction in the reported target offenses during the time treatment was in place. Specifically during the first 3 bi-weeks, or first 6 weeks of treatment. Table 5 displays the results of the further repeated measures t-tests for Models I thru N. The table shows the average mean number of reported targeted offenses in each area for each time period. The table also includes the t-value and indicates if any findings are significant.

Table 5 Further repeated measures t-tests results for Models I, J, K, L, M and N mean number of aggravated assaults and robberies

Time Period	Target Area	Target Area	Target Area	Control Area	Control Area	Control Area
	Model I	Model J	Model K	Model L	Model M	Model N
t <sub>0</sub> Prior to Treatment (January 1, 2011 to July 29, 2011- 15 bi-weeks)	1.85			1.618		
t <sub>1a</sub> Early Treatment (July 30, 2011 to November 4, 2011- 3 bi-weeks)	0.83	0.83		1.35	1.35	
t <sub>1b</sub> Late Treatment (September 10, 2011 to November 4, 2011 - 4 bi-weeks)		1.75	1.75		1.93	1.93
t <sub>2</sub> Post Treatment (November 5, 2011 to July 27, 2012- 19 bi-weeks)			2.01			1.64
t-value	-4.61**	3.43*	0.881	-0.92	1.57	-0.65
	* Significant at the p. 05 level					
	** Significant at the p. 01 level					

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The target and catchment areas were then reevaluated using the new split time periods; early during treatment and late during treatment. A repeated measures t-test was first conducted to compare the mean number of reported aggravated assaults and robberies in the target catchment areas early during treatment to pretreatment ( $t_{1a}$  to  $t_0$  see Model O). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the  $t_{1a}$  ( $M=1.83$ ,  $SD= 2.04$ ) and  $t_0$  ( $M=1.66$ ,  $SD= .97$ );  $t(3) = .231$ ,  $p >.05$  using a two-tail test.

Next a repeated measures t-test was conducted to compare the mean number of reported aggravated assaults and robberies in the target catchment areas late during treatment to early during treatment ( $t_{1b}$  to  $t_{1a}$  see Model P). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the  $t_{1b}$  ( $M=1.68$ ,  $SD= 1.06$ ) and  $t_{1a}$  ( $M=1.83$ ,  $SD= 2.04$ );  $t(3) = -.26$ ,  $p >.05$  using a two-tail test.

Finally a repeated measures t-test was conducted to compare the mean number of reported aggravated assaults and robberies in the target catchment areas posttreatment to late during treatment ( $t_2$  to  $t_{1b}$  see Model Q). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the  $t_2$  ( $M=1.32$ ,  $SD= .52$ ) and  $t_{1b}$  ( $M=1.68$ ,  $SD= 1.06$ );  $t(3) = -1.28$ ,  $p >.05$  using a two-tail test. These results indicate that a significant difference was not detected in the mean number of reported targeted offenses during any of the time periods. These findings further confirm that neither a displacement of crime, nor a diffusion of benefits was experienced in the target catchment areas.

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Following the reevaluation of the target catchments for exploratory purposes the control catchments were reevaluated using the same repeated measures t-tests using a two-tail test over the same time periods. A repeated measures t-test was first conducted to compare the mean number of reported aggravated assaults and robberies in the control catchment areas early during treatment to pretreatment ( $t_{1a}$  to  $t_0$  see Model R). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the  $t_{1a}$  ( $M=.83$ ,  $SD=.64$ ) and  $t_0$  ( $M=.84$ ,  $SD=.48$ );  $t(3) = -.10$ ,  $p > .05$  using a two-tail test.

Next a repeated measures t-test was conducted to compare the mean number of reported aggravated assaults and robberies in the control catchment areas late during treatment to early during treatment ( $t_{1b}$  to  $t_{1a}$  see Model S). The repeated measures t-test discovered a statistically significant difference between the mean number of reported aggravated assaults and robberies in the  $t_{1b}$  ( $M=1.75$ ,  $SD=1$ ) and  $t_{1a}$  ( $M=.83$ ,  $SD=.64$ );  $t(3) = 3.38$ ,  $p < .05$  using a two-tail test. This phenomenon was unexpected. Due to the lack of treatment, foot patrol, in the control area that the catchment surrounds the increase in the reported targeted offenses in the control catchment areas cannot be attributed to displacement. An explanation of this phenomenon is beyond the scope of the current study.

The final exploratory repeated measures t-test was conducted to compare the mean number of reported aggravated assaults and robberies in the control catchment areas posttreatment to late during treatment ( $t_2$  to  $t_{1b}$  see Model T). The repeated measures t-test failed to discover a statistically significant difference between the mean number of reported aggravated assaults and robberies in the  $t_2$  ( $M=1.02$ ,  $SD=.74$ ) and  $t_{1b}$  ( $M=1.75$ ,  $SD=1$ );  $t(3)$

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= -1.60,  $p > .05$  using a two-tail test. Table 6 displays the results of the further repeated measures t-tests for Models O thru T.

Table 6 Further repeated measures t-tests results Models O, P, Q, R, S and T mean number of aggravated assaults and robberies

Time Period	Target Catchment Area	Target Catchment Area	Target Catchment Area	Control Catchment Area	Control Catchment Area	Control Catchment Area
	Model O	Model P	Model Q	Model R	Model S	Model T
t <sub>0</sub> Prior to Treatment (January 1, 2011 to July 29, 2011 - 15 bi-weeks)	1.66			0.84		
t <sub>1a</sub> Early Treatment (July 30, 2011 to September 9, 2011 - 3 bi-weeks)	1.83	1.83		0.83	0.83	
t <sub>1b</sub> Late Treatment  (September 10, 2011 to November 4, 2011 - 4 bi-weeks)		1.68	1.68		1.75	1.75
t <sub>2</sub> Post Treatment (November 5, 2011 to July 27, 2012- 19 bi-weeks)			1.32			1.02
t-value	0.231	-0.265	-1.28	-0.10	3.38*	-1.60

\* Significant at the p. 05 level



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These subsequent findings demonstrate a statistically significant, at the  $p = .01$  level, initial reduction in the mean number of aggravated assaults and robberies in the target area only during the early treatment period. There were no reductions of reported aggravated assaults or robberies in the control areas, in the target catchment areas, or most of the control catchment areas.

There appears to be a “diminishing returns” similar to what Koper (1995) suggested following the early treatment period, and consistent with observations by Sherman (1990) and Scott (2003) that crime prevention benefits are realized after an initial increase of police presence. However, these results also indicate that aggravated assaults and robberies increased later in the treatment phase, suggesting that the crime prevention benefit was relatively short-term, and decay occurred despite the continuation of the treatment. This important observation, and the policy implications from these results, will be more fully detailed in the conclusion chapter.

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## CHAPTER 5

### CONCLUSION

This chapter will present the conclusion of the study. The conclusion chapter includes an overview of the study, policy implications of the findings, and offers recommendations for future studies.

#### **Overview**

The Kansas City Foot Patrol Project sought to replicate the Philadelphia Foot Patrol Experiment. The Kansas City Foot Patrol Project involved 16 officers, 2 pairs of rookie officers, on two shifts Tuesday through Saturday patrolling four preselected areas on foot. The Kansas City Foot Patrol Project occurred between Aug. 1, 2011 and Oct. 31, 2011. The four treatment areas which received foot patrol were compared using a within group comparison between the time periods of pretreatment and during treatment. The examination of the effectiveness of the use of foot patrol to target violent crime in micro-places uncovered an initial success in violent crime reduction.

The results of the initial repeated measures t-tests results revealed a statistically significant decrease in the mean number of aggravated assaults and robberies during the treatment period ( $t_0$  to  $t_1$  see Model A). The crime prevention benefit produced no residual deterrence, as crime returned to pre-project levels in the posttreatment periods (see Model C). There was also evidence that foot patrol produced statistically significant reductions in the mean number of robberies and aggravated assaults in the target areas when comparing pre-

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treatment to the first 6 weeks of treatment (see Model I). Additionally, crime increased during the second phase of treatment (see Model J), and this change was statistically significant. Meanwhile, there is no evidence that the incidence of robberies and aggravated assaults changed in the control areas; regardless of what time intervals are examined (see Models L, M, and N). The further repeated measures t-tests results confirmed that in fact foot patrol did produce a crime prevention benefit, especially during the early weeks of treatment in the target areas, but this effect decayed even while treatment continued.

It is unknown why “diminishing returns” (Koper, 1995) was experienced and robberies and aggravated assaults increased during the second-half of the treatment period. Logically, if the treatment was indeed impacting crime, then crime should be impacted similarly throughout the treatment because the treatment dosage (e.g., number of officers, personnel hours, etc.) was constant during the 90-day period. The analysis reveals that any impact of foot patrol on robberies and aggravated assaults may not be linear. The initial introduction of foot patrol yielded nearly immediate and abrupt effects; however, these effects over time dissipated.

No evidence of crime displacement was detected in the models (Models O, P, or Q). The catchment areas around the target and control areas were examined, and unlike the discussion above, regardless of how time intervals were defined, there was only one statistically significant observed change in crime in these catchment areas. The only significant difference occurred in a control catchment area, and thus foot patrol cannot be attributed to this increase in reported target offenses, and thus this increase cannot be considered crime displacement. This phenomenon is usual and explaining the cause is beyond the scope of the current study. These findings are important, as it strongly suggests that foot patrol initiatives may be undertaken without the threat of crime being displaced.

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The results presented here in the Kansas City Foot Patrol Project provide a better understanding of police crime prevention strategies in general, and foot patrol specifically. Within the context of the Evidence-Based Policing Matrix (Lum et. al., 2011) several dimensions appear to be of central importance. First is the level of proactivity, or perhaps content of the treatment itself. Ratcliffe et al. (2011) was classified as proactive, and as the current project attempted to stay faithful to that study, it too would be considered proactive in scope. These studies, along with others (Piza & O'Hara 2012; Sorg et al. 2013) begin to strongly suggest that foot patrol, as a treatment, is effective at addressing violent crime (i.e., robberies and aggravated assaults). Second, like many studies reviewed in the Matrix, the current treatment was geographically concentrated in micro-places. This too is consistent with the Philadelphia Foot Patrol Experiment. This further suggests that strategically focusing policing resources in micro-places can increase effectiveness of the treatment. Additionally, there is no evidence of displacement beyond the micro-place.

Yet what is not addressed systematically in the Matrix is treatment duration, and results presented here suggest this is also an important dimension of understanding the impact of policing strategies. Foot patrol is expensive because it requires a significant dedication of personnel resources in a relatively small location. In an era of shrinking police budgets this reality may discourage policy makers from implementing foot patrol within their jurisdictions. However, the results presented here suggest that foot patrol need not be implemented 'in the long term', rather in relatively short periods. In fact, results presented here indicate that implementation of foot patrol in micro-places should be no longer than 6 weeks. Results from this study also suggest that continued deployment in foot beats past this 6 week threshold yields diminishing returns, and beyond 6 weeks, foot patrol not only becomes less effective, but also

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less efficient. Treatment dosage is multidimensional, this includes the number of officers and personnel resources; however, at least equal attention should be dedicated to understanding duration as a dimension of dosage too. These observations are explored more fully for policy makers as well as academics.

### **Policy Implications**

The evaluation of the Kansas City Foot Patrol Project produced statistically significant results. It was determined that the Kansas City Foot Patrol Project was successful at reducing the mean number of reported aggravated assaults and robberies in violent crime micro-places during the treatment period. The most promising crime reduction benefits were achieved during the early treatment period that lasted approximately six weeks. Following the initial reduction treatment decay was experienced and the number of aggravated assaults and robberies returned to pre project levels.

Results are suggestive that “back-off” stages should be defined similar to what Sherman (1990) recommended for crackdowns. A possibility is that foot patrol may be most effectively and efficiently implemented in 6-week intervals. This suggests the 90-day treatment phase was too long, and that this treatment could be more effectively and efficiently executed if shortened. Results presented here indicate interventions longer than this point yield diminishing returns. Future analysis should more fully examine the appropriate threshold dosage of the intervention, as Koper, (1995) did with early hot spot policing treatments.

The findings here support the suggestions of Piza and O’Hara (2012) and Sorg et al. (2013) to utilize foot patrols in violent crime micro-places for short periods of time and rotate them to other areas. The findings also support the findings of Sherman (1990) and Scott’s

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(2003) crackdown studies. In addition to utilizing foot patrol for short period of time the patrol should follow the “Koper Curve” in that the foot patrols should only stay in one area for the optimal time period of 14-15 minutes, in other words keep it moving, to achieve maximum effectiveness. Moving the patrols location to varying micro-places on varying schedules would also increase the deterrent effect for offenders, due to they would not know when the increased officer presence and increased risk of apprehension would be present or for how long, as well as understanding the content of foot officers (i.e., exactly what officers did, whether officers engaged in different styles when interacting with the public, their level of proactivity, etc.)

A careful examination of the effect of utilizing episodic foot patrol is needed because short-term foot patrols may not be sufficient to cultivate meaningful relationships with citizens. Specifically the removal of foot-beat officers may have a negative effect on citizens’ attitudes. This is an important area which future studies should explore.

### **Future Analysis**

The current study was limited in ways the researcher looks to overcome in future studies. One limitation was observation and treatment integrity. Though the current researcher was not able to participate, the research team conducted “walk alongs” on foot patrol shifts with officers, but were not able to “walk along” on all shifts due to a lack of personnel. Future studies should utilize systematic social observations to observe treatment integrity.

Due to funding realities and time restraints the current study was unable to evaluate foot patrol based on subjective measures. Future studies should examine subjective measures through the use of surveys or interviews of citizens and officers. The use of interviews or surveys of citizens would capture what impact the use of foot patrols in violent crime micro-

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places had on citizens' attitudes towards police, perceptions of police legitimacy, and fear of crime and disorder. By doing so this would more fully explore whether foot patrol is executed in an equitable and fair manner between officers and members of the public.

Interviews or surveys of officers would capture the experiences of officers on foot patrol. The results of the interviews or surveys could be used to determine the impact foot patrol had on officer's job satisfaction, perceived effectiveness, perceived relationship with the community, performance, and ascertain officer buy in. The execution of interviews and surveys of citizens and officers coupled with objective measures will provide a more holistic view of the benefits that foot patrol in violent crime micro-spaces provides.

Future studies evaluating the use of foot patrols should also evaluate the effectiveness of foot patrol based on objective measures with more statistically sophisticated methods. Specifically, since the data is longitudinal the use of longitudinal regression models should be used by future studies to control for variations in time. The use of more statistically rigorous methods would be a better test of effectiveness, and paint a more sophisticated picture of treatment effect and treatment decay. The use of more rigorous methods was beyond the scope of the current study.

Another limitation was that there was an overlap in the catchment areas of a target and control area in the current study. Due to the extremely close geographic proximity of the violent crime micro-places the overlap was unavoidable. Ideally future studies will avoid use of overlapping catchment areas to aid in evaluation. Yet given the results presented in Models O, P, Q, R, and T it is unlikely this change would yield substantively different conclusions.

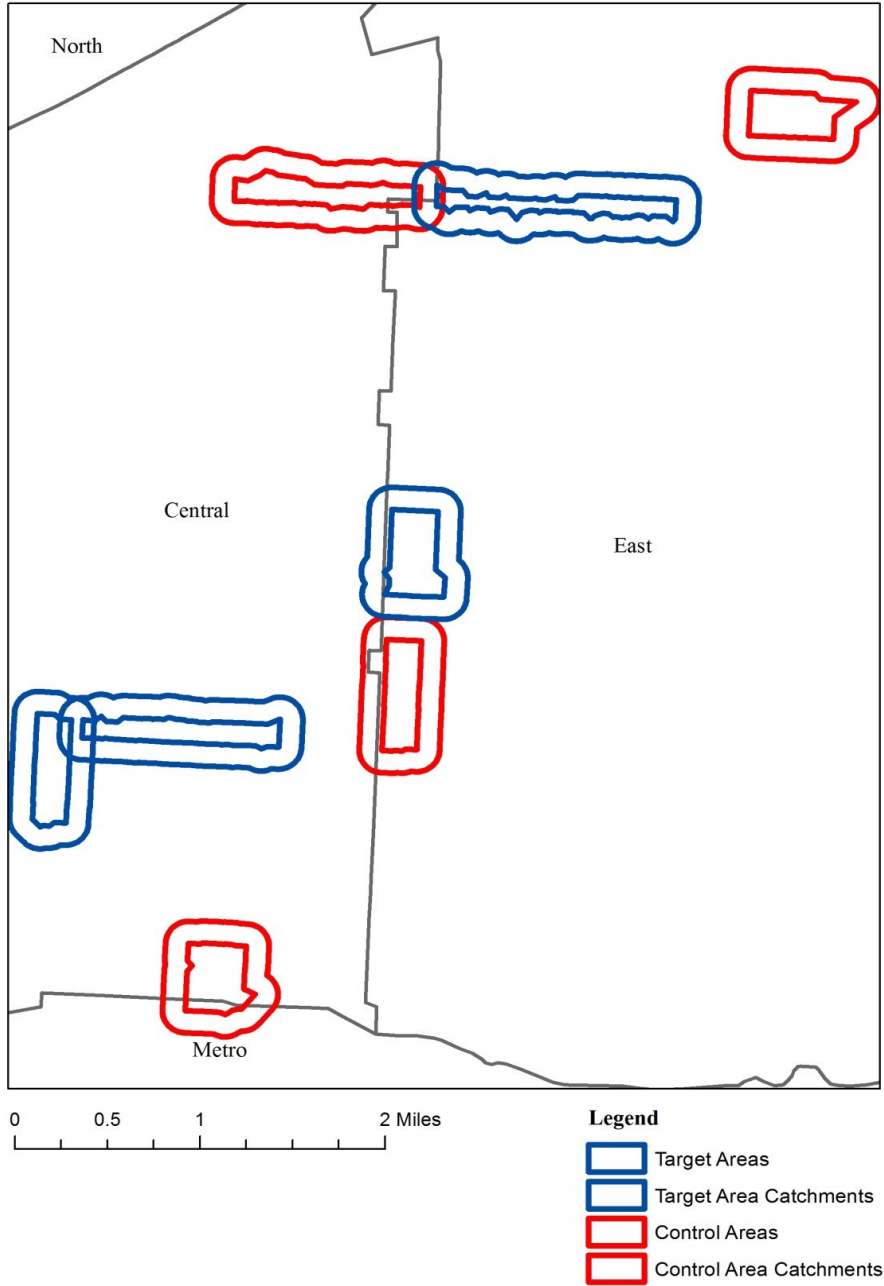
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Future studies should aim to test the sustainability of foot patrols in violent crime micro-places. As with any crime reduction strategy, future studies should examine the cost and resource allocation associated with the use of foot patrols, such as increased police presence, to evaluate if the crime reduction benefit experienced is a suitable return on the investments and allocations made. A test of the economic feasibility of foot patrols in violent crime micro-places was beyond the scope of the current study, but is an important area of consideration for future studies.



APPENDIX A

Kansas City Foot Patrol Project Target and Control Catchment Areas



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## VITA

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