REDUCING FIREARMS VIOLENCE THROUGH DIRECTED POLICE PATROL*

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Research Summary:
This evaluation of a directed police patrol project utilizes a pre post quasi-experimental design with a non-equivalent control group as well as an interrupted time series analysis. The results suggest that directed patrol had an impact on firearms crime in one of the target areas but not the other.

Policy Implications.
The results suggest that a specific deterrence strategy whereby the police utilize directed patrol to focus on suspicious activities and ***locations reduced violent*** *gun crime. In contrast, a general deterrence strategy focused on maximizing vehicle stops did not have an apparent effect.*

In the early 1990s, the Kansas City Police Department conducted a quasi-experiment in which they tested the effect of directed police patrols in a high violent crime neighborhood. The directed patrol strategy utilized officers in patrol cars who were freed from the responsibility of responding to calls for police service. The officers were instructed to proactively patrol the neighborhood with a special emphasis on locating and seizing illegally possessed firearms. The results of the project were striking. The increased traffic enforcement led to a 65% increase in seizures of illegal firearms. This, in turn, was associated with a 49% decrease in gun-related crime in this area (Sherman and Rogan, 1995; Sherman et al., 1995).

Given the seriousness of the firearms violence problem in America

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(Zimring and Hawkins, 1998), the Kansas City results are potentially important. Fifty percent reductions in firearms crime in the nation's high violent crime neighborhoods would produce significant savings in human lives, health, and criminal justice costs, and it would enhance the quality of life in our inner cities. Yet, the Kansas City findings are based on a single-site evaluation for a six-month period.

The present paper reports on an effort to examine a police strategy similar to that employed in the Kansas City project. Although differences in area characteristics, baseline levels of firearms crime, dosage levels of patrol activities, and data availability make it impossible to conduct a replication of the Kansas City research, this study does allow us to examine whether directed police patrol implemented under different conditions can generate reductions in firearms crime. Specifically, we present the findings from an initiative implemented by the Indianapolis Police Department (IPD) in July 1997 with the intent of reducing violent crime. In contrast with Kansas City, IPD's project was implemented in two target areas for a 90-day period. Consequently, the Indianapolis project allowed for a test of two somewhat different strategies. This article addresses the following two questions:

- Are the promising results in terms of reducing firearms crime of the Kansas City gun experiment observed in Indianapolis?
- Are there differential effects of two related but different directed patrol strategies?

PRIOR RESEARCH

Directed patrol involves assigning officers to a particular area and freeing them from responding to calls for service so they can engage in proactive investigation and enforcement of suspicious activities (Cordner, 1981; Moore, 1980). Directed patrol is thought to be most promising as a crime control tool when it is targeted at high crime geographic locations and to hot spots of crime within high crime locales (Sherman et al., 1997). The most common strategy in a directed patrol effort is the use of traffic stops. Traffic stops are hypothesized to provide a deterrent effect through visible increased police presence and the increased number of contacts between police and citizens in a particular area. Some suggest that they also may have an incapacitation effect through the detection of illegal activities and subsequent arrest or seizure of firearms and drugs.

The theoretical and empirical bases for the Kansas City and subsequent Indianapolis directed patrol projects draw on several related bodies of research. These range from increased traffic enforcement to police crackdowns to targeted enforcement activities aimed at high-risk individuals in high crime locations.

AGGRESSIVE TRAFFIC ENFORCEMENT

In his classic study of varying police styles across different departments, James Q. Wilson (1968) distinguished among professional/legalistic, order-maintenance, and service styles. In a subsequent study, Wilson and Boland (1978) hypothesized that more aggressive policing in legalistic police departments would result in less crime. They argued that policing styles would influence traffic enforcement and that legalistic departments would make more traffic stops and issue more citations than would be the case in other departments. This more aggressive style of traffic enforcement would in turn increase the risks for potential offenders and consequently be associated with lower levels of crime. Wilson and Boland provided support for the hypothesis by examining the number of traffic citations issued per officer in 35 large U.S. cities. They found that more aggressive traffic enforcement was negatively related to rates of robbery.

Sampson and Cohen (1988) extended this research by examining rates of robbery in 171 U.S. cities. Sampson and Cohen measured aggressive traffic enforcement by recording the number of disorderly conduct and driving-under-the-influence arrests on a per officer basis. They found that cities with more aggressive traffic enforcement had lower rates of robbery. The effects appeared to be both indirect, through higher certainty of arrest for robbery, and direct, through a general deterrent effect on potential robbers.

The Wilson and Boland and Sampson and Cohen studies were not supported in research reported by Jacob and Rich (1981). They examined the relationship between traffic citation rates and robbery in eight cities for the period 1948 to 1978. In only two of the eight cities was the pattern between higher rates of traffic enforcement and lower rates of robbery observed.

More recently, Weiss and Freels (1996) conducted a field experiment in Dayton, Ohio, designed to assess whether an increase in traffic enforcement would lead to reduced levels of crime. Having identified several potential target areas, experimental and control sites were randomly chosen. A six-month project was then initiated in which officers were instructed to aggressively enforce traffic laws in the experimental zone. The increased traffic enforcement was not related to either increased arrests or a reduction in crime. The authors caution, however, that the lack of effect may have been due to dosage levels. Although the officers working the experimental area did triple the number of vehicle stops compared with those working the control area, the absolute level of traffic enforcement was not very high, averaging 34 vehicle stops per week.

POLICE CRACKDOWNS

Directed patrol projects can be thought of as one approach of a broader group of strategies known as police crackdowns. Crackdowns have been defined as "increases in either the certainty or severity of official police reaction to a specific type of crime or all crime in a specific area. . .. Police crackdowns constitute a sudden, usually proactive change in activity" (Sherman, 1990:2). Crackdowns have been used to address both general crime problems in a particular location and specific crime problems, including drug sales, prostitution, robbery, and drunk driving (see Sherman, 1992).

One of the early studies focused on a New York City precinct with very high levels of robbery. The precinct received a 40% increase in police presence and witnessed reductions in crimes occurring outdoors (Press, 1971). Similar results were reported by Chaiken et al. (1974) following increased levels of directed foot patrol to the New York City subway system in response to high levels of robbery. Consistent with these findings were the results of a study of saturation patrol in Nashville, Tennessee, that targeted four high crime zones. In this study, the level of increased enforcement associated with the crime reduction was significant. Four additional patrol cars were assigned to a zone normally patrolled by one (Schnelle et al., 1977). The crime reduction was restricted to the nighttime patrols. The fact that the patrol cars were marked and that the patrols occurred at night contrasted this study with an earlier daytime burglary patrol studied by Schnelle et al. (1975). In this earlier Nashville study involving unmarked cars on daytime patrol, there was no significant reduction in burglary.

One of the first studies of a directed patrol strategy was Cordner's (1981) evaluation in Pontiac, Michigan. Using crime data to identify target areas and target crimes, a special unit of officers was freed from responding to calls for service and directed toward patrol and investigation of target areas. The study found that the number of directed patrol arrests was associated with a decline in crime in the target area. Indeed, "every four directed patrol arrests were associated with three less target crimes in target areas" (p. 49). The author concluded that it appeared to be the aggressive level of patrol, in terms of arrests, vehicle stops, and field interrogations, rather than the increased level of patrol that led to the crime reductions.

More recent evidence comes from several analyses of experimentation with directed patrol at crime hot spots in Minneapolis. Using an experimental design, Minneapolis police provided extra patrol at 55 randomly selected high crime street comers, whereas normal levels of patrol were provided at 55 control locations. Sherman and Weisburd (1995) found

that the experimental hot spots experienced modest reductions in crime and larger reductions in disorder when compared with the control sites. Koper (1995) analyzed data from the same project and found a positive relationship between the amount of time the police were present at a hot spot and the amount of time the location remained crime-free (see also Green, 1996).

TARGETING FIREARMS VIOLENCE BY CONSIDERING HIGH-RISK LOCATIONS AND PEOPLE[1]

The logic of directed patrol efforts is that if a general increase in the number of police has a negative impact on crime, as suggested in Marvell and Moody (1996), then increasing the level of police in high crime areas should produce even stronger crime-control results. This is particularly the case if the officers are freed from responding to calls for service and can thereby increase their contacts in the area.

One of the initial studies of directing police resources at high crime areas and high-risk individuals was conducted in Kansas City by the Police Foundation (Pate et al. 1976). This study contrasted the effect of three police strategies on rates of arrest for robbery and burglary. Two of the strategies were offender-based, and one was location based. The findings indicated that providing information on known serious offenders to nontactical units led to increased rates of arrest. Further, location-oriented patrol generated more arrests than did perpetrator-oriented patrol. Perpetrator-oriented patrol did, however, generate arrests of individuals with more extensive prior felony arrest records. The study was unable to assess impact on crime.

The San Diego field interrogation study was one of the first to suggest that proactive approaches could produce crime reduction results (Boydstun, 1975). This study was conducted to assess the effect of field interrogations, stopping and questioning suspicious individuals, on suppressible crime.[2] Three study conditions were implemented. In one area, traditional field interrogation was continued. In a second, officers received special training on field interrogations with the goal of minimizing police-citizen conflict. In the third area, field interrogations were discontinued.

1. David Kennedy reported a similar deterrent effect on firearms crime through face-to-face meetings with high-risk probationers and parolees (see Kennedy, 1998). Rosenfeld and Decker (1996) reported on a St. Louis Police Department initiative that involved parental consent to search juveniles' rooms, where there was evidence a youth was in possession of a firearm. Although the results of the evaluation are not yet available, the strategy is consistent with a targeted deterrence approach.

2. Suppressible crimes were defined as robbery, burglary, grand theft, petty theft, auto theft, assault/battery, sex crimes, and malicious mischief/disturbances (Boydstun, 1975:4)

The most interesting findings emerged from the area where field interrogations were suspended. This area witnessed a significant increase in crime. Once field interrogations were resumed, there was a significant reduction in crime (see also Whitaker et al., 1985).

Taking a related but somewhat different approach is the Kansas City Gun Experiment that forms the basis for the Indianapolis project (Sherman and Rogan, 1995; Sherman et al., 1995). In the Kansas City experiment, directed police patrols worked a police beat with the highest levels of firearms violence in the city. For a six-month period, over 4,500 police hours were invested in the area. The most frequent form of investigation was through traffic stops, and officers were trained to search for illegally possessed firearms. The target beat witnessed a 65% increase in firearms seizures and nearly a 50% decrease in gun crime. In contrast, a control beat experienced a slight decline in gun seizures and a small increase in gun crime.

THEORETICAL IMPLICATIONS

The theoretical arguments that provide the foundation for directed patrol strategies are based on notions of deterrence and incapacitation (Moore, 1980; Sherman et al., 1995; Wilson, 1994). Increasing the number of police (e.g., Marvell and Moody, 1996) and increasing the number of contacts through directed patrol and increased traffic stops and citations (e.g., Sampson and Cohen, 1988; Wilson and Boland, 1978) and crackdowns (e.g., Press, 1971; Schnelle et al., 1977) is thought to have a general deterrent effect through the increased likelihood of detection and punishment of criminal activity. To the extent that directed patrol and crackdowns are focused on high crime areas, the strategy gains efficiency by increasing the certainty of detection and punishment in the areas with the highest concentrations of undesirable behavior.

The focus on high crime areas, particularly when coupled with attention to high-risk individuals, moves the strategy from the level of general deterrence to that of specific deterrence. That is, to the extent that the Kansas City Gun Experiment focused police attention and increased the number of contacts with individuals likely to be carrying illegal firearms, the deterrent effect moved from changing the perception of likelihood of arrest of the general population to changing the perception of those individuals most likely to resort to firearms violence (Moore, 1980; Sherman and Rogan, 1995; Sherman et al., 1995). Similarly, the San Diego field interrogation (Boydstun, 1975) intended to send a specific deterrence message to high-risk individuals in high-risk locations.

Incapacitation effects are typically thought of as the removal of individual offenders from the community through incarceration (Moore, 1980).

This may indeed be the outcome of directed patrol and crackdown projects; yet, it has been unmeasured in the available studies. A second type of incapacitation effect, however, may also be operating. If either through the threat of punishment or through the actual removal of illegal firearms from the community, there are simply fewer high-risk firearms in the hands of high-risk individuals at high-risk locations, then the opportunities for firearms violence might have been reduced (Moore, 1980; Sherman et al., 1995; Wilson, 1994).

SUMMARY

The studies reviewed above suggest that directed police attention to high crime areas or to specific crime types can lead to crime reductions. There are enough studies of contrary findings (e.g., Jacob and Rich, 1981; Weiss and Freels,1996), however, to suggest that crime reductions are not the automatic outcome of increased enforcement activity. Thus, additional research on the effectiveness of directed patrol efforts is important. The research presented here makes two specific contributions to this body of research. First, the police intervention that was implemented allows us to compare the effectiveness of increasing police presence using aggressive traffic enforcement (general deterrence) with an intervention strategy that focuses on high-risk individuals at high-risk locations (specific deterrence). Second, we provide an important extension of the Kansas City Gun Experiment. Our results provide some insight into whether the Kansas City results were the product of removing illegal firearms from the streets or from increased attention given to high-risk individuals when the police are directed to look for illegal weapons.

METHODOLOGY

Multiple data collection and analysis methods were employed in this study. These included activity data recorded by the officers working directed patrol, Uniform Crime Report (UCR) offense data, police incident reports, and ride-along observations of directed patrol officers.[3] The basic analytical strategy involved a pre-post, quasi-experimental design. In the first stage of the analysis, we compared changes in our dependent variables for the 90-day directed patrol period with the same 90-day period of the previous year (July 15-October 15). This comparison controls for seasonal effects that would be observed if we were to use the preceding 90-day period. In addition to employing a two-beat comparison area, for the crime analyses, we also compared changes in the target beats

3. Additionally, surveys of citizens living in the target and comparison beats and of officers working directed patrol were conducted.

with changes in citywide crime once the target beats were subtracted from city totals.

In the second stage, we developed Autoregressive Integrated Moving Average time-series models to test whether changes observed during the intervention period were significantly different from pre- and post-intervention trends in violent crime. Models were constructed for both target areas, the comparison area, and for the net citywide trend.

The research team designed a log sheet for officers working directed patrol that allowed for a daily tally of activities, such as vehicle stops, citizen contacts, arrests, tickets issued, and firearms and drugs seized. The officers turned in the activity sheets to their sergeants, who attached computerized incident reports to the sheets. The log sheets and the incident reports were collected by a captain who maintained a record of all directed patrol activities. The original incident reports were then turned over to the research team. Comparison of the research team files with the IPD captain's records allowed for verification of activity data.

IPD's data processing unit provided citywide beat level data for the following UCR offenses: homicide, robbery, aggravated assault, burglary, and motor vehicle theft. Also provided were data for the subcategories of aggravated assault with a gun and armed robbery.

Formal UCR categories do not provide a mechanism to clearly count all firearms crime. Some categories, for example, armed robbery, include firearms but also include robberies committed with other types of weapons. Other categories, for example, criminal mischief, may include a firearm, but most such offenses do not include a firearm. IPD, like many police departments, includes a check-off box on its incident reports for an officer to indicate that a firearm was involved. IPD officials, however, warned us that the check-off was not a reliable indicator because many officers fail to check the box in all relevant incidents.[4] Consequently, the research team read every incident report from the four target beats and the two comparison beats for the 90-day period of 1996 (pre-intervention period) and 1997 (intervention period). A total of 19,335 incident reports were read.[5] All reports involving a firearm were then coded. Many, although not all (e.g., weapon found), of these incidents involved a firearms crime. The firearms crimes uncovered by reading incident reports became an additional outcome measure.

The incident reports also provided a measure of the total number of firearms seized in the target and comparison areas. Although the activity sheets included illegal weapons seized and legal weapons discovered, the

4. Indeed, of the 1997 incidents involving a firearm, 35% of the reports did not indicate a firearm was involved according to the check-off box.

5. There were 9,937 in 1996 and 9,998 in 1997.

incident reports were needed to count the total number of seizures (including those seized by nondirected patrol officers) in these areas during the project period.

OBSERVATIONS

To further document the way in which the treatment was delivered, researchers rode with participating officers. This allowed direct observation of the nature of the police-citizen contacts and the opportunity to examine whether the contacts differed according to treatment area.

In order to gather observation data, researchers conducted 100 hours of observation. In order to arrange the observation, researchers first contacted supervisors to secure their authorization. When researchers appeared at police district stations for their observation rides, they were assigned an officer. In every case, the observed officers were volunteers. It is important to note that although the group of officers that was observed was representative, it was not a random sample.

Observers utilized a codebook to gather data about each contact. In this case, "contact" refers to encounters between officers and citizens, either in vehicles or on foot. Our data contain records of 104 such events. Although the small number of observations limits the conclusions we can draw, we consider the observational data in the context of the activity data and the contrasting strategies that were intended to be implemented in each target area.

BACKGROUND ON TARGET AREAS

In order to place the present directed patrol project into context, we will compare the project to the Kansas City Gun Experiment. The Kansas City experiment was a 29-week project begun in the summer of 1992. The project targeted one relatively small police beat comprising a population of 4,528 residents and .64 square miles (Shaw, 1994). The emphasis in the Kansas City project was to identify and seize illegally possessed firearms pursuant to arrests, traffic stops, and investigations of suspicious persons.

The Indianapolis directed patrol experiment was a 90-day project initiated on July 15, 1997, in beats A51 and A52 (north district) and B61 and B62 (east district). The beats were chosen through the Indianapolis Management Accountability Program (IMAP). The IMAP program, an adaptation of New York Police Department's COMPSTAT program, indicated that these four beats were consistently among the highest in the city for violent crime, drug distribution, and property crime.

Beats A51 and A52, referred to as the north target beats, cover a territory of just less than three square miles with over 16,000 residents. The neighborhoods within these beats are predominately African-American

and low income. Beats B61 and B62, referred to as the east target beats, cover a territory of 1.7 square miles with over 14,000 residents. The neighborhoods comprise principally white residents, with 14% African-American and a small but growing Latino population. This area also comprises primarily low-income households.

Compared with the target beat in the Kansas City project, the target beats in the directed patrol experiment are a bit more populous. As will be discussed in subsequent sections, the Kansas City target beat received nearly as much police patrol as did all four Indianapolis target beats.

In the analysis that follows, we also make comparisons to a two-beat comparison area. This comparison area consists of east district beats (1341 and B42). Selecting comparison beats in a study like this is very problematic. Simply put, no two areas are alike and they are likely to be influenced by a myriad of demographic, economic, neighborhood, and police processes. Further, in an ideal situation, we would select the beats most like our beats in terms of crime patterns. This was impossible, however, because the beats most like our target beats tend to be those that are contiguous to the target beats. We did not want to utilize contiguous beats as comparisons, however, because we intend to examine crime effects in these surrounding beats.

Consequently, beats B41 and B42 appeared to be the most similar available choices. These beats are more populous (19,305) than are the target beats and cover a significantly larger land area (4.74 square miles). These two beats house primarily African-American residents (86%), thus, being more comparable to the north target beats.

Table 1 presents data on the level of crime (1996) in the City of Indianapolis, the north and east target beats, and the comparison beats.[6] The table indicates that the north target area had a homicide rate three times that of the city. Its robbery and aggravated assault rates were almost twice that of the city. On property crime, however, the north target beats' property crime rate was actually slightly lower than was the city's rate. The east target area's homicide rate fell between that of the north area and the city's rate. The east target area had a particularly high rate of robbery, and the rate of aggravated assault was nearly twice that of the city. The rate of property crimes was higher in the east target area than in either the city or the north target areas. The north and east target beats are dense areas, thus, reducing their population-based rate of crime. Both north and

6. The City of Indianapolis is part of a consolidated city-county governmental structure. The police department's jurisdiction consists of the center city with a 1990 population of 377,723. The crime data and the population base refer to the police department's jurisdiction. The figures differ from those reported in the UCR program that includes the consolidated city-county jurisdiction (approximately 810,000 population).

east areas, however, have very high rates of violent crime for the area size of the beats (see Table 1). This was why the areas were chosen for the projects based on violent crime maps. Finally, although the comparison beats had a higher violent crime rate than did the city, it was considerably lower than the target beats.

Table 1. UCR Index Offenses, 1996

	Citywide		North		East		Comparison	
	#	Rate per 1,000 Residents	#	Rate per 1,000 Residents	#	Rate per 1,000 Residents	#	Rate per 1,000 Residents
Murder	114	0.3	15	0.9	7	0.5	9	0.5
Robbery	2600	6.8	194	11.7	229	15.6	122	6.3
Aggravated Assault	4280	11.3	330	19.9	301	20.6	281	14.5
Rape	424	1.1	23	1.4	25	1.7	23	1.2
Total Violent	7418	19.6	**562**	**33.8**	**562**	**38.4**	**435**	**22.5**
Burglary	7797	20.6	303	18.2	**564**	**38.5**	**337**	**17.5**
Larceny	16842	44.6	633	38.1	796	54.4	469	24.3
Motor Vehicle 'Theft	5860	15.5	295	17.8	**269**	**18.4**	**350**	18.1
Total Property	30499	80.7	1231	74.1	1629	111.2	1156	59.9
Total Index	37917	100.4	1793	107.9	2191	149.6	1591	82.4

	Citywide	North	East	Comparison
	Rate per Square Mile	Rate per Square Mile	Rate per Square Mile	Rate per Square Mile
Murder	1.2	5.4	4.1	1.9
Robbery	27.6	69.5	1355	25.7
Aggravated Assault	45.4	118.3	178.1	59.3
Rape	4.5	8.2	14.8	4.8
Total Violent	78.6	201.4	332.5	91.8
Burglary	82.6	108.6	333.7	71.1
Larceny	178.5	226.9	471.0	98.9
Motor Vehicle Theft	62.1	105.7	159.2	73.8
Total Property	323.2	441.2	963.9	243.9
Total Index	401.9	642.6	1296.4	335.6

In addition to comparisons with the two comparison beats, when we examine impact on crime we will also compare the target beats' crime trend to the trend for the city as a whole (minus crime in the target beats). This element of the analysis works on the assumption that the city crime trend provides the best estimate of what was likely to occur in the target beats absent the directed patrol project. Although an imperfect comparison, given the limits in selecting any comparison area, we believe that examining both the trend in the comparison beats and in the rest of the city provides additional tests of any effects within the target areas.

THE EAST AND NORTH DISTRICT STRATEGIES

Once the target beats were selected, planning for actual implementation was left to the command staff of each district (east and north). Separate training sessions were held for officers working each target area. The supervisor of the east target area explained that the goal was to increase the number of traffic stops to maximum levels. Thus, officers were to focus on traffic violations, such as speeding, rolling through stop signs, expired license tags, inoperable tail lights, and the like. This was similar to the strategy employed in the east target area during a directed patrol project in November and December 1995. The goal was to maximize vehicle stops and thereby create a sense of significantly increased police presence. The theory was that offenders would be deterred by this increased police presence. Additionally, the police anticipated that the large number of vehicle stops would yield seizures of illegal weapons and drugs. The research team labeled the east target strategy as the general deterrence strategy.

The north target area supervisor explained that traffic and pedestrian stops would be used in a more targeted fashion to increase investigations of suspicious persons and to focus on seizures of illegal weapons and drugs. The north district followed what the supervisor described as a targeted offender approach.[7] This would involve a more selective approach to vehicle and pedestrian stops with a more thorough investigation upon the stop. The idea was to target resources toward individuals suspected to be involved in illegal behavior (specific deterrence). It also sought to maximize seizures of illegal weapons and drugs through the more thorough investigation. Although not discussed in the training, during the course of the project, the supervisor decided to have officers pair up with probation officers and conduct home visits. This was considered consistent with the targeted offender strategy.

Following the supervisor's presentation, members of the research team explained that there would be an evaluation of the effects of the directed patrol initiative. The research team described the types of data collection efforts that would occur and asked for cooperation with the observers that would occasionally ride with officers.

7. We realize that in this period of public scrutiny of police traffic stops, the terminology "targeted offender" *will* be criticized by some. The term was not used by the police to indicate an assumption that individuals in traffic stops were "offenders" but to emphasize to north district officers to focus on situations in which there was some indication of suspicion of criminal activity.

OUTPUTS

Table 2 presents some of the basic findings on activities.[8] As the table indicates, officers working directed patrol spent just under 4,900 hours assigned to the project. This compared with 4,512 hours in the Kansas City Gun Experiment. Officers issued 1,638 traffic citations and 2,837 warning tickets. There were over 5,000 vehicle stops, 84 felony arrests, 654 misdemeanor arrests, and 254 warrant arrests during the directed patrol project.

Table 2. Summary Activity Data-Kansas City Gun and Indianapolis Directed Patrol Projects

	Kansas City (target beat 7/7/92-1/7/93)	Indianapolis (target beats 7/15-10/15/97)		
	Total	Total	North target	East target
Officer Hours	4512	4879.75	1975	2904.75
Traffic Citations	1090	1638	698	940
Warning Tickets	NA	2837	510	2327
Combined Tickets *a*	NA	4475	1208	3267
Vehicle Stops	NAb	5253	1417	3836
Felony Arrests	NAc	84	41	43
Misdemeanor Arrests	NAc	654	284	370
Warrant Arrests	NAc	254	109	145
Total Arrests	616	992	434	558
Illegal Gun Seizures	29d	25	12	13
Legal Gun Discovered	NA	81	43	38

NA = not applicable.
a The Kansas City Study did not report warning tickets. See Sherman et al. (1995).
b The Kansas City study reports 948 car checks but not a total number of vehicle stops.
c The Kansas City study reports state and federal arrests (N = 170) and city arrests (N = 446). See Sherman et al. (1995).
d The Kansas City study notes that four of the guns seized were legal but confiscated temporarily for safekeeping. The report does not report on other legal guns that may have been discovered. See Sherman, et al. (1995).

The total number of vehicle stops also appears to be considerably higher in the directed patrol experiment than in the Kansas City experiment. Although the Kansas City report does not provide a clear number of stops, extrapolation of their data suggests the number is significantly lower than in Indianapolis.[9] Thus, it appears that the Kansas City project led to fewer

8. Unfortunately, we do not have access to time-series data on police activity levels. Thus, we cannot systematically examine the level of increase in police activity. IPD officials note that the level of police activity during the directed patrol initiative was "dramatically" higher than was normal police activity in these target areas.

9. The Kansas City report indicates there were 948 car checks, although presumably this is a subset of car stops. The report also indicates that one gun was found for

traffic stops, although perhaps more intensive investigations of the stops.

The number of illegal gun seizures was similar in both projects. There were 25 in directed patrol (0.5 per 100 patrol hours) compared with 29 in Kansas City (0.6 per 100 patrol hours). The Kansas City report indicates that four of the 29 weapons seized were legally possessed but retained by the police for safe-keeping. It is unclear if this is the total number of legal weapons discovered. Interestingly, in the directed patrol experiment, an additional 81 legally possessed weapons were discovered. Thus, officers uncovered more than three legally possessed weapons for every one illegally possessed weapon in these high crime neighborhoods. Indeed, some officers joked that people who were stopped were more likely to have a gun permit than a driver's license.

Table 2 also indicates the differences in the north and east target areas. The east area received approximately 900 additional patrol hours, and there were nearly three times as many vehicle stops in the east target area. East area officers wrote more citations and warning tickets and made 124 more arrests. Officers working the north area made nearly as many felony arrests and one fewer illegal gun seizure.

DOSAGE LEVELS [10]

The summary data from the Kansas City Gun Experiment and the Indianapolis directed patrol study indicate that in raw numbers, the two projects were similar in activities and outputs. The data obscure important differences, however, given the variation in target areas and in the length of the projects. To address these concerns, we converted the data into standardized measures. Thus, we consider the number of arrests and gun seizures per area and project duration and per residents and project duration. In effect, this generates "dosage level" measures that indicate the level of activities and outputs normed by the geographic area of the target, by the number of residents of the target area, and by the length of duration of the experiment.[11] The results are displayed in Table 3.

Table 3 demonstrates that dosage levels were significantly higher in Kansas City than they were in either Indianapolis target area. This is the product of the 29-week duration and of the smaller area and population of the target area in Kansas City. The east target area generated about one-half of the Kansas City levels in terms of officer hours, whereas the north

every 28 traffic stops. Given that 29 guns were found, this would imply 812 vehicle stops.

10. The authors thank an anonymous reviewer for suggesting the conversion to dosage levels.

11. Person-weeks is calculated by population X weeks; square mile-weeks is calculated by square miles X weeks.

Table 3. Area Characteristics and Dosage Levels

Area		Kansas City		Indianapolis		
		Target	Control	North	East	Control
Weeks	Before/During	29	29	13	13	13
Population	Before/During	4528	8142	16612	14645	19305
Square Miles	Before/During	0.64	1.89	2.79	1.69	4.74
Person-Weeks	Before/During	131312	236118	215956	190385	250965
Square Mile-Weeks	Before/During	18.56	54.81	36.27	21.97	61.62
Gun Crimes	Before *a*	169	184	75	42	49
Dosage Levels:						
Officer Hours per 10,000 Person-Weeks		0.03	NA	0.009	0.015	NA
Officer Hours per Square Mile-Weeks		243.10	NA	54.45	132.21	NA
Vehicle Stops per 10,000 Person-Weeks		NA	NA	0.01	0.02	NA
Vehicle Stops per Square Mile-Weeks		NA	NA	39.07	174.60	NA
Arrests per 10,000 Person-Weeks		0.005	NA	0.002	0.003	NA
Arrests per Square Mile-Weeks		33.19	NA	11.96	25.40	NA
Gun Seizures per 10,0(X1 Person-Weeks *b*						
	Before	3.91	4.02	**1.80**	**1.58**	**1.79**
	During	6.46	3.40	1.94	2.36	1.08
Gun Seizures per Square Mile-Weeks *c*						
	Before	2.76	1.73	1.08	1.36	0.73
	During	4.57	1.46	1.16	2.05	0.44

a Kansas City is based on 29 weeks, Indianapolis on 13 weeks.
b Sherman and Rogan (1995:683) report that gun seizure data are based on 26 weeks rather than on 29 weeks.
c See note b.

target area received considerably fewer officer hours. As was suggested in the earlier tables, the east area's dosage level for vehicle stops was considerably higher than was the case in the north area. The east target's arrest dosage level was higher than in the north target area and both were lower than that observed in Kansas City. Arrest dosage tended to be somewhat closer to the levels in Kansas City than were the other indicators. The dosage level for gun seizures was considerably lower in both Indianapolis target areas than was true in Kansas City. Thus, an obvious research question is whether directed patrol at considerably lower dosage levels will generate reductions in firearms crime?

EVIDENCE OF CONTRASTING STRATEGIES

Table 4 provides a comparison of activities in the two Indianapolis target areas considered on a per-vehicle stop basis. The data suggest that the strategies employed in each area, although similar, were distinct. Although the east target beats received nearly 1,000 more officer hours, and east target officers made considerably more vehicle stops and wrote more tickets, north target officers were more likely to generate these outputs on a per vehicle stop basis. With the exception of warning tickets, north target officers wrote more citations, made nearly three times as many felony arrests and twice as many total arrests, and seized and discovered more weapons for every vehicle stop they made. The north district officers also made 126 probation checks. These were not the result of a vehicle stop but were proactive checks of probationers at their residences. This was part of the targeted offender strategy. We believe that these different patterns when contrasting total activities with outputs per vehicle stop reflect the difference between the north target area's targeted deterrence approach and the east district's general deterrence/wide net approach.

Table 4. Outputs per 100 vehicle stops

	North per 100 stops	East per 100 stops
Warning Tickets	36.0	60.7
Citations	49.2	24.5
Probation Contacts *a*	8.9	0
Felony Arrests	2.9	1.1
Total Arrests	30.6	14.5
Illegal Gun Seizures	0.85	0.34
Total Guns	3.9	1.3
Total Vehicle Stops	1,417	3,836

a The probation stops were based on addresses of probationers residing in the target beats rather than through a routine vehicle stop.

The observational data also suggested there were subtle differences in strategy between the two target areas, consistent with the targeted offender and general deterrence strategies. Trained observers rode with participating officers for 100 hours of observation. This resulted in observations of 104 contacts between officers and citizens. When asked to identify the reason why the contact was initiated, 55% of north officers identified a traffic law violation, whereas 71% of east district contacts were based on traffic law violations. Nineteen percent of contacts in the north district were directed toward a suspicious person or situation. Only 3% of east district contacts were based on suspicious activity (beyond the traffic violation). Whereas only 9% of east district contacts resulted in a traffic citation, 26% of the north district contacts resulted in a citation. Contacts in both areas tended to last about 15 minutes.[12]

FIREARMS SEIZURES

The total number of illegal firearms seized in the two target areas was similar. The total number includes those seized by the directed patrol officers as well as those seized through regular police activities in the target areas. As Table 5 indicates, there were 42 firearms seized in the north target area during the 90-day project period and 45 seized in the east target area. This represented a modest increase over 1996 levels for the north target area and a sizeable 50% increase for the east district. The number of seizures in the comparison area declined 40%.[13]

As indicated earlier, the dosage levels of firearms seizures in Kansas City were considerably higher than was the case in Indianapolis (see Table 3). The Kansas City target area witnessed a 65% increase in firearms seizure dosage levels (3.91 pre-intervention; 6.46 during the project). The Indianapolis east target area witnessed an increase of approximately 50% in dosage level (1.58 pre-intervention; 2.36 during the project), whereas the north target area experienced a modest increase of 8% (1.8 pre-intervention; 1.94 during the project). Thus, the east target area was more similar to Kansas City in terms of the increased seizure of illegal firearms, although at considerably lower dosage levels.

IMPACT ON CRIME

FIREARM-RELATED CRIME

The basic findings in terms of the impact on firearms-related violent crime are presented in Table 6. These include homicides, aggravated assault with a gun, armed robbery, and total gun crimes. The homicide and armed robbery categories include some incidents that involved a non-firearm weapon.

Table 6 presents the findings for the four target beats (combining north

12. Distribution of offender race was generally consistent with district demographics. Eight-two percent of citizens stopped in the north district were African-American. In contrast, 31% of east district citizens stopped were African-American. Thus, in the north district, African-Americans were somewhat under-represented in vehicle stops, given the neighborhood demographics, whereas in the east district, African-Americans were somewhat over-represented in vehicle stops, compared with neighborhood composition.

13. IPD officials were unable to account for the decline in firearms seizures in the control area. There was no change in patrol levels during the project period and either during the comparison period of the prior year nor the 90 days prior to the project's implementation. Thus, we do not see any evidence of a "reverse treatment effect," whereby resources were removed from a comparison area.

Table 5. Illegal Gun Seizures and Gun Crime with Standardized Denominators

Area	Kansas City		Indianapolis		
	Target	Control	North	East	Control
Guns Seized					
Before	46	85	39	30	45
During	76	72	42	45	27
Gun Seizures per 10,000 Person-Weeks					
Before	3.91	4.02	1.80	1.58	1.79
During	6.46	3.40	1.94	2.36	1.08
Gun Seizures per Square Mile-Weeks					
Before	2.76	1.73	1.08	1.36	0.73
During	4.57	1.46	1.16	2.05	0.44
Gun Crimes					
Before	169	184	75	42	49
During	86	192	53	57	53
Gun Crimes per 10,000 Person-Weeks					
Before	3.67	2.16	3.47	2.21	1.95
During	1.13	2.67	2.45	2.99	2.11
Gun Crimes per Square Mile-Weeks					
Before	12.87	7.79	2.97	1.91	0.80
During	6.54	8.13	1.46	2.59	0.86

and east), the north and east target areas, the comparison beats, and the citywide total (excluding the four target beats). The data are presented for the time period when the directed patrol project was running (July 15, 1997 to October 15, 1997) and the same period for the prior year (July 15, 1996 to October 15, 1996). The tables report the results of statistical significance tests that were conducted using the General Linear Model analysis of variance approach. With this approach, the variance is partitioned into period effects, area effects, and the effects due to the interaction of area and period. It is the interaction effect that is of interest as it allows us to contrast the trend in the target area with the trend in the comparison area and in the city as a whole. Where the target area experiences a decline in crime, the method tests whether the decline is greater than what would be expected by chance given the trend in the comparison area. Similarly, where the target area experiences no change or an increase, the method allows us to test whether this is significantly different from the trend in the comparison area.

When looking at the total target beats, the most significant finding is for homicide. Homicides in the target beats were reduced from 11 in the 1996 period to 1 in 1997. The comparison beats witnessed no change in the

Table 6. Change in Firearm-Related Crime, 1996-1997*

		Total Target Beats	% Chg	North Target	% Chg	East Target	% Chg	Comparison Beats	% Chg	Citywide (Net)	% Chg
Homicide	96	11		7		4		3		17	
	97	1	**a	1	**a	0	**b	3	**	26	+52.9
Aggravated Assault-Gun	96	59		40		19		22		333	
	97	54	-8.5c	24	-40.0d	30	+57.9	48	+118.2	402	+20.7
Armed Robbery	96	62		31		31		13		356	
	97	55	-11.3	19	-38.7e	36	+16.1	21	+61.5	338	-5.1
Gun Crimes	96	117		75		42		49		NA	
	97	110	-6.0	53	-29.3	57	+35.7	53	+8.2	NA	

* Crime data are for the 7/15 to 10/15 period of 1996 and 1997, respectively.
** Percent change not calculated due to small N.
a Comparison to citywide trend significant <_ .05.
b Comparison to citywide trend significant <- .10.
c Comparison to citywide trend significant < .05; to comparison beats significant <- .10.
d Comparison to both citywide trend and comparison beats significant <- .05.
e Comparison to comparison beats significant <- .10.

number of homicides, although the small number of incidents makes it difficult to assess meaning. At the same time, homicides increased for the remainder of the city from 17 in 1996 to 26 in 1997, a 53% increase.

We examined the 11 homicides that occurred in 1996 (pre-intervention) in the target beats. Three were domestic situations, and one was unknown in terms of motive or relationship between offender and victim. The remaining seven involved the type of street-level violence that the directed patrol strategy seeks to deter. Given the nature of these pre-intervention homicides, it appears plausible that the directed patrol strategy played a role in the reduction in homicide for the target beats in 1997 compared with 1996.

The firearm-related crime data for the total target beats, however, mask the stark contrast between the north and east districts. Although homicide declined in both areas, and the declines were significant when contrasted with the citywide trend, for the other offenses, significant declines were observed in the north target area, whereas increases were observed in the east target area. For example, aggravated assaults with a gun and armed robbery declined 40% in the north target beats. These were statistically significant declines compared with both the comparison beats and the citywide trend. Similarly, total gun crimes declined 29% in the north targets. In contrast, aggravated assaults with a gun increased 58% and armed robbery 16% in the east target area. Although these increases were smaller than were the increases observed in the comparison beats, they were larger than were the increases citywide. Thus, with the possible exception of homicide, it appears that the positive effects on firearms-related crimes

were confined to the north target beats.[14]

As was the case in Kansas City (Sherman et al., 1995), there was little apparent impact on other types of crime. Although robbery and aggravated assaults declined in north district, this was primarily accounted for by the decline in firearms assaults and robberies. Motor vehicle theft declined in the north target; however, it also witnessed a decline in the comparison beats and citywide.[15]

Time-Series Analysis

To further examine impact on violent crime, we estimated a number of ARIMA models for each target site, the control site, and the city (minus the target areas). Given the likelihood that directed patrol should have an immediate effect that lasts the duration of the intervention period, an abrupt, permanent transfer function was modeled to capture any intervention effects (a .05 alpha level was used to determine significance). The outcome data include the violent crimes of homicide, aggravated assault with a gun, and armed robbery. The data were compiled in weekly totals from the first week in 1995 through January 12, 1998. All ARIMA models were constructed on these 158 weeks.

The series were broken into three time periods: a 132-week pre-intervention period, a 13-week intervention period, and a 13-week post-intervention (removed treatment) period. This permitted three sets of ARIMA models to be estimated. In a modified Cook and Campbell (1979) notation, the first set of models can be represented by the following design:

$O_1 \ldots O_{132} X_{133} \ldots X_{145} \bar{X}_{146} \ldots \bar{X}_{158}$ series 1 (East)

$O_1 \ldots O_{132} X_{133} \ldots X_{145} \bar{X}_{146} \ldots \bar{X}_{158}$ series 2 (North)

14. We also contrasted the project period with the prior 90 days. The results for the north target area were consistent. Homicides, gun assaults, and armed robberies declined from 87 to 44. The findings for the east target area were interesting as offenses declined from 88 to 66. These types of offenses increased in the comparison area (59 to 72) and in the city (758 to 766).

15. We also examined the 90-day period following the end of the directed patrol project to examine for "residual deterrence" (Sherman, 1990). The north target continued to experience a decline in homicide, although homicides actually increased in the east target. Both target areas experienced large decreases in aggravated assault with a gun (30% and 49% for north and east, respectively). Yet the declines did not attain statistical significance because the comparison area and the city also experienced declines (6% and 10% reductions). North witnessed a 15% percent reduction in armed robbery. East and the comparison area witnessed increases, whereas the city experienced a 14% decrease. Thus, the north district data were consistent with a residual deterrent effect. The city decrease, however (although of a smaller magnitude), confounds straightforward interpretation.

$O_1 \ldots O_{132} O_{133} \ldots O_{145} O_{146} \ldots O_{158}$ series 3 (Control)

$O_1 \ldots O_{132} O_{133} \ldots O_{145} O_{146} \ldots O_{158}$ series 4 (Net City)

where each O_t indicates a nonintervention observation at week "$_t$", X_t an observation during the intervention period at week "$_t$", and $\bar{X}_t$ a post-intervention (or removed treatment) observation at week "$_t$". A multiple interrupted time series with removed treatment and multiple nonequivalent no-treatment control groups, this design can be considered a global test of the intervention as it compares the pre-intervention and the post-intervention periods to the intervention period to ascertain an overall effect. Series 1 and 2 represent each of the target series (east and north), whereas series 3 and 4 indicate the two control series (control site and city net the target sites). For these models, the intervention for the north target area is significant, indicating an intervention effect. According to the impact estimate, the north district had almost two fewer violent crimes (T-Value = −2.12) on average per week during the intervention. Conversely, the control area witnessed an increase of slightly more than one violent crime (T-Value = 2.19) on average per week during the intervention period. Neither the east nor the city net the target area series revealed significant changes during the intervention period (see Table 7).

Although informative, the first set of models does not indicate the distinct impacts of introducing and removing the intervention. The second and third set of models were constructed to isolate these effects. The second set of models can be represented as follows:

$O_1 \ldots O_{132} X_{133} \ldots X_{145}$ series 5 (East)

$O_1 \ldots O_{132} X_{133} \ldots X_{145}$ series 6 (North)

$O_1 \ldots O_{132} O_{133} \ldots O_{145}$ series 7 (Control)

$O_1 \ldots O_{132} O_{133} \ldots O_{145}$ series 8 (Net City)

This set of models estimates the immediate impact of introducing the intervention (i.e., compares the pre-intervention period with the intervention period) by way of a multiple interrupted time series with multiple nonequivalent no-treatment control groups design. Series 5 and 6 illustrate each of the target series (east and north), and series 7 and 8 indicate the two control series (control site and city net the target sites). Instead of the full 158 weeks, these models are estimated from 145 weeks to reflect the exclusion of the post-intervention (removed treatment) period. Like the first set of models, this set indicated significant changes in the north target and control areas. The north district had almost two fewer violent crimes (T-Value = −2.33) on average per week during the intervention, whereas the control area experienced an increase of just more than one

Table 7. Time Series ARIMA Models

Time Span	Intervention	Interval	# Intervals	Variable	ARIMA	Impact/SE	T-Value	Noise/SE	T-Value	Q-Statistic[a]
1/3/95–1/12/98	OOXXOO	week	132+13+13=158	Citynet	(0,1,1)	.67/4.22	0.16	.76/.05	15.55	14.4<33.92
1/3/95–1/12/98	OOXXOO	week	132+13+13=158	Control	(0,0,0)	1.46/.67	**2.19**	—	—	21.2<35.17
1/3/95–1/12/98	OOXXOO	week	132+13+13=158	East	(0,0,1)	.41/.78	.52	-.20/.08	-2.61	25.1<33.92
1/3/95–1/12/98	OOXXOO	week	132+13+13=158	North	(0,0,2)[b]	-1.72/.82	**-2.12**	-.27/.08	-3.50	27.0<33.92
1/3/95–10/13/97	OOXX—	week	132+13=145	Citynet	(0,1,1)	-4.15/6.03	-.69	.75/.05	14.31	13.3<33.92
1/3/95–10/13/97	OOXX—	week	132+13=145	Control	(0,0,0)	1.54/.66	**2.33**	—	—	23.0<35.17
1/3/95–10/13/97	OOXX—	week	132+13=145	East	(0,0,1)	.55/.78	.71	-.21/.08	-2.52	21.8<33.92
1/3/95–10/13/97	OOXX—	week	132+13=145	North	(0,0,2)[b]	-1.93/.83	**-2.33**	-.31/.08	-3.91	27.9<33.92
10/14/97–1/12/98	—OOXX	week	13+13=26	Citynet	(0,1,1)	-1.09/7.48	-.15	1.18/.21[c]	5.62	7.2<9.49
10/14/97–1/12/98	—OOXX	week	13+13=26	Control	(0,0,0)	-.62/1.04	-.59	—	—	5.6<11.07
10/14/97–1/12/98	—OOXX	week	13+13=26	East	(0,0,1)	.48/.81	.59	-.15/.20	-.77	5.2<9.49
10/14/97–1/12/98	—OOXX	week	13+13=26	North	(0,0,2)[b]	1.14/.60	1.90	.22/.20	1.10	9.1<9.49

[a] This format compares the calculated Q-Statistic to the critical Q-Statistic at the .05 alpha level.
[b] The iterative ARIMA process indicated this series need only be modeled with a second-order moving average parameter. Therefore, a first-order moving average parameter was not included in the model.
[c] The estimate for the moving average parameter is not within the bounds of invertibility. This is likely a result of applying the ARIMA model constructed from the entire series (158 weeks) to the smaller series (only 26 weeks), which cannot be modeled independently due to having too few observations.

violent crime (T-Value = 2.33) on average per week during the intervention period. Again, neither the east nor the city net the target area series indicated significant changes during the intervention period.

The final set of models captures the immediate effect of removing the intervention. These are also based on a multiple interrupted time series with multiple nonequivalent no-treatment control groups design, except that the intervention and post-intervention (removed treatment) periods are compared. These can be viewed as:

$X_{133}. . .X_{145}\bar{X}_{146}. . .\bar{X}_{158}$ series 9 (East)

$X_{133}. . .X_{145}\bar{X}_{146}. . .\bar{X}_{158}$ series 10 (North)

$O_{133}. . .O_{145}O_{146}. . .O_{158}$ series 11 (Control)

$O_{133}. . .O_{145}O_{146}. . .O_{158}$ series 12 (Net City)

Like the above models, series 9 and 10 represent the target series (east and north), whereas series 11 and 12 correspond to the control series (control site and city net the target sites). None of these models indicated significant changes from removing the intervention. This suggests that the intervention effect remained in the north target area even after removing the treatment, as did the rise in violent crime in the control area. However, these effects must be interpreted with caution, given that these models were estimated from only 26 observations (13 weeks of intervention and 13 weeks of removed treatment). Although the best data available, this small sample may not have had enough statistical power to detect significant changes as a result of removing the intervention.[16]

Crime Displacement or Diffusion of Benefits

One concern with a geographic-based effort like this is that crime will simply be displaced to other areas. Some researchers (Clarke and Weisburd, 1994; see also Eck, 1993), however, have found that more likely than displacement, projects like these can have positive effects on surrounding areas (diffusion of benefits). To examine these possibilities, we initially examined the total number of homicides, gun assaults, and armed robberies in the five beats surrounding the north target. There was a 10% increase in the total firearms crimes in these five surrounding beats. In absolute numbers, the increase was from 125 in 1996 to 137 in 1997. The daily mean increased from 1.34 to 1.47, but this was spread over the five beat area and was not a statistically significant increase. Even if the

16. Kleck (1997) has criticized the time-series approach. The consistency in findings between the General Linear Model analysis utilizing the quasi-experimental design and the time-series analysis lends support to the conclusion of an effect in the north target area but not in the east target area.

increase was attributable to displacement, the net increase in the surrounding beats (+12) compares with a reduction of 34 in the target beats.

We then examined the trend for five crime types (homicide, aggravated assault, robbery, burglary, vehicle theft) in the five surrounding beats. Overall, there was a slight reduction from 656 offenses in 1996 to 650 in 1997.

These results demonstrate there was no pattern of a diffusion of benefits and little indication of displacement. The fact that there was a numerical, although statistically insignificant, increase seems to indicate the need for continued attention to the issue of displacement.

DISCUSSION

Perhaps the simplest statement that can be made about the Indianapolis directed patrol project is that the Kansas City Gun Experiment results were observed in one test site but not the other. The impact of directed patrol on gun crime, homicide, aggravated assault with a gun, and armed robbery in the north target beat was similar to that observed in Kansas City. In contrast, there was no impact of directed patrol on gun-related crime, other than a possible effect on homicide, in the east target area. In the following sections, we consider what we know about directed patrol as a strategy to reduce firearms violence as well as lingering questions about this strategy.

WHAT DO WE KNOW?

The literature reviewed in prior sections suggested that directed police patrol can have an effect on levels of crime. The Kansas City and Indianapolis studies extend this general finding to the specific issue of whether directed police patrol, emphasizing traffic stops, can reduce levels of firearms violence. Looking at the Kansas City and Indianapolis research, we find that in two of three tests, the hypothesis that directed police patrol can reduce firearms violence was supported.

One of the several hypotheses offered by Sherman et al. (Sherman and Rogan, 1995; Sherman et al., 1995) to account for their findings was that the increased number of illegally possessed firearms that were removed from the high violent crime neighborhood generated reductions in gun crimes. If removal of illegal weapons was the causal mechanism, however, then the Indianapolis project should have produced more of an effect in the east target area, where illegal firearms seizures increased 50%, than in the north target area, where firearms seizures increased a modest 8%.[17]

17. Similarly, east target dosage levels were closer to those in Kansas City than was the case for the north target area.

Of course, the results were just the opposite.

If the contrast between the Indianapolis north and east target areas raises doubts that it is the increase in seizures of illegal weapons that generated the reduction in firearms crime, then we must consider other factors that distinguish the Kansas City, Indianapolis north, and Indianapolis east initiatives. Two factors to be considered are the varying strategies employed and the racial composition of the target neighborhoods.

As noted earlier, two related but different strategies were employed in the two Indianapolis target areas. In the east district, a general deterrence strategy was employed that relied heavily on maximizing the number of vehicle stops. The idea was to create an enhanced police presence through a large number of vehicle stops. The vehicle stops become a mechanism for uncovering illegal weapons, drugs, and other illegal activities. The north district, in contrast, employed a specific deterrence or targeted offender strategy. This approach sought to maximize stops of particularly suspicious activities and to conduct more thorough investigations upon a vehicle or pedestrian stop. It too sought to identify illegal firearms, drugs, and illegal activities.

The two strategies were evident in the activity data. The east district officers made twice as many vehicle stops and issued more traffic tickets than did north district officers. North target vehicle stops yielded higher rates of citations (versus warnings), arrests, and gun seizures per vehicle stop. Interestingly, it appears that the activity levels (when examined on a per vehicle stop basis) in the north target area were more similar to the levels in the Kansas City experiment than were the activity levels in the east district.

Thus, one potential explanation for the differential effects is that the targeted offender/specific deterrence approach was a more effective mechanism for reducing firearms-related violence. It may be that the targeted offender approach sends a message of increased surveillance and removes firearms from those individuals most likely to engage in violent crime. This is in contrast to the wider net approach observed in the east target area. This finding is consistent with prior research that suggests that crackdowns that focus on specific types of crime in specific locations have the most effect on crime (Sherman,1990). It is also consistent with Wilson (1994) and Moore's (1980; see also Kennedy, 1998) argument that a law enforcement focus on illegal gun carrying may deter firearms violence and with Sherman et al.'s (1995) hypotheses based on deterrence or incapacitation. That is, the targeted offender strategy may have either deterred likely illegal gun carriers or led to the arrest and incapacitation of likely gun offenders. It does not appear that an incapacitation effect through the removal of firearms generated the gun crime reduction.

This is not to imply that the removal of illegally possessed weapons is

unimportant. Recall that the total number of firearms seized in both districts was nearly equal. Indeed, it may be that the focus on illegal firearms helps to direct officers toward the appropriate suspicious targets for investigation and that the subsequent removal of illegal firearms provides the type of incapacitation effect that Sherman et al. hypothesized.

An additional common ingredient in the Kansas City and Indianapolis initiatives is that the effect on firearms crime was observed in predominantly African-American neighborhoods (in contrast, the east target area was a predominantly white neighborhood). This is similar to Sampson and Cohen's (1988) finding that aggressive proactive policing had its strongest effect on robbery rates for African-Americans. Could it be that African-American neighborhoods, in contrast to poor, white neighborhoods, may have been underserved by police patrol relative to rates of violent crime? "Thus, a significant increase in police patrol may be perceived as more of a change in neighborhood life than was the case in the east target area. Clearly, we cannot address these issues with a sample size of three, but the issue warrants future attention.[18]

REMAINING QUESTIONS

Although these results indicate that directed patrol in high violent crime locations can have a significant effect on violent, firearms crime, there are a number of questions that must be addressed before we can offer clear policy implications.

At a minimum, it is clear that we need to learn much more about the effects of directed patrol strategies on crime. The causal mechanisms generating the reduced firearms crime in both Kansas City and the north target area remain unclear. The results could be due to a deterrent effect whereby high-risk individuals are either less likely to carry illegal firearms or where they are less likely to engage in the underlying behaviors that lead to homicides, gun assaults, and armed robbery. The results could also be due to a related incapacitation effect based on the arrest, prosecution, and incarceration of individuals likely to engage in violent crime. Contrasting Kansas City, north and east target area results begin to demonstrate the analytic advantages of a multiple site, multiple strategy, test of the effects of directed patrol (see Sherman, 1998; Sherman et al., 1997).

18. A similar issue relates to the fact that east district officers wrote more warning tickets than did the north target officers. At first glance, it may appear that officers were more "tolerant" in the east area in comparison with the north target area. Looking at all the data, however, reveals that citizens were much more likely to be stopped, arrested, given a citation, and given a warning ticket in the east target area during this 9n-day period than were individuals in the north target area. *Thus,* we do not believe the data are consistent with discriminatory behavior toward residents in the African-American neighborhood.

Our present state of knowledge, however, does not allow us to answer the theoretical questions of what produced the effects observed in Kansas City and the north target area. Clearly, we need to design studies to help isolate the causal mechanisms of directed patrol initiatives.

A second crucial need is to better understand the differential impact of directed patrol strategies on racial/ethnic groups and neighborhoods. Given the current attention to the issue of racial profiling in traffic stops, the question of acceptance of directed patrol strategies by citizens, particularly members of the minority community, is extremely important. It is significant to note that in both Kansas City (Shaw, 1995) and Indianapolis (Chermak et al., 2001; McGarrell et al., 1999), there was a high level of public support for the police and for aggressive enforcement among both whites and blacks. Consistent with the survey findings, IPD officials report that there was not a single citizen complaint tied to the directed patrol project.[19] We believe that the support in Indianapolis was the product of police managers meeting with neighborhood leaders before implementation and securing community support for the effort prior to its implementation. Similarly, police supervisors emphasized the need to treat citizens with respect and to explain the reasons for the stop. These findings are consistent with the Vera Institute of Justice research in New York City that found that effective police management (leadership, supervision and monitoring, and relationships with the community) appeared to be the crucial factor in securing community support for aggressive but respectful policing (Davis and Mateu-Gelabert, 1999).

With this said, it is also apparent that a police department could-implement a directed patrol strategy in a fashion that would harm police-minority community relationships. To this end, it will be important to further clarify the differential effects of the targeted offender/specific deterrence strategy from the wide net/general deterrence strategy. That is, if subsequent research supports the finding that the more focused specific deterrence strategy is more effective in reducing firearms violence, this may also affect the level of community support for directed patrol. It would appear that minority group citizens would be more supportive of increased patrol focused on people thought to be involved in criminal activity than they would of a general increase in patrol leading to significantly higher levels of traffic stops within a neighborhood.

Finally, we need to understand more about the relationship between firearms laws and legal and illegal gun carrying. One distinction between

19. Survey findings may, however, under-represent some segments of the population (e.g., young males). *Thus,* future research should examine the impact of aggressive enforcement strategies on the perceptions of those individuals most likely to experience police stops.

the Kansas City and Indianapolis projects was that Indiana is a shall issue state, whereas Kansas has more restrictive gun carrying laws.[20] One apparent consequence is that Indianapolis officers came upon considerably more legally possessed firearms during their patrols. Beyond this distinction, however, it is difficult to draw conclusions about the effectiveness of law enforcement in varying gun possession legal contexts. This, too, argues for multisite studies.

SUMMARY

The results of this directed patrol project are both promising and perplexing. They are promising in the sense that they suggest the important findings from Kansas City that firearms-related crime can be reduced through directed police patrol are also found in Indianapolis. Given the extent to which the crime problem in the United States is largely a problem of firearms-related violence (Zimring and Hawkins, 1998), these are extremely promising results. They are perplexing in that the east target area, where seizures of illegally possessed firearms increased most significantly, did not experience a reduction in firearms crime. The results are promising enough to warrant continued experimentation. The lingering questions suggest the need for such study.

REFERENCES

Boydstun, John
1975 San Diego Field Interrogation: Final Report. Washington, D.C.: Police Foundation.

Chaiken, Jan, Michael W. Lawless, and Keith A. Stevenson
1974 The impact of police activities on subway crime. Urban Analysis 3:173-205.

Chermak, Steven, Edmund F. McGarrell, and Alexander Weiss
2001 Citizen perceptions of aggressive traffic enforcement strategies. Justice Quarterly 18:365-91.

Clarke, Ronald V. and David Weisburd
1994 Diffusion of crime control benefits. In R.V. Clarke (ed.), Crime Prevention Studies, Volume 2. Monsey, N.Y.: Criminal Justice Press.

Cook, Thomas and Donald T. Campbell
1979 Quasi-Experimentation: Design and Analysis Issues for Field Settings. Chicago: Rand McNally.

20. In a "shall issue" state, licenses to carry a firearm are issued in a largely non-discretionary process, whereby the permit shall be issued unless the applicant is clearly disqualified (e.g., prior felony conviction). In contrast, in a "may issue" state, authorities have the discretion to refuse to issue the permit.

Cordner, Gary W.
1981 The effects of directed patrol: A natural quasi-experiment in Pontiac. In J. Fyfe (ed.), Contemporary Issues in Law Enforcement. Beverly Hills, Calif.: Sage.

Davis, Robert C. and Pedro Mateu-Gelabert
1999 Respectful and Effective Policing: Two Examples in the South Bronx. New York City: Vera Institute of Justice.

Eck, John E.
1993 The threat of crime displacement. Criminal Justice Abstracts 25:527-546.

Green, Lorraine
1996 Policing Places with Drug Problems. Thousand Oaks, Calif.: Sage.

Jacob, Jacob H. and Michael J. Rich
1981 The effects of police on crime: A second look. Law and Society Review 15:109-122.

Kennedy, David M.
1998 Pulling Levers: Getting Deterrence Right. Washington, D.C.: National Institute of Justice Journal.

Kleck, Gary
1997 Targeting Guns. New York: Aldine de Gruyter.

Koper, Christopher
1995 Just enough police presence: Reducing crime and disorder by optimizing patrol time in crime hot spots. Justice Quarterly 12:649-672.

Marvell, Thomas B. and Carlisle E. Moody
1996 Specification problems, police levels and crime rates. Criminology 34:609 46.

McGarrell, Edmund F., Steven Chermak, and Alexander Weiss
1999 Reducing Firearms Violence Through Directed Police Patrol: Final Report on the Evaluation of the Indianapolis Police Department's Directed Patrol Project. Submitted to the National Institute of Justice.

Moore; Mark H.
1980 The police and weapons offenses. Annals of the American Academy of Political and Social Sciences 452:22-32.

Pate, Tony, Robert A. Bowers, and Ron Parks
1976 Three Approaches to Criminal Apprehension in Kansas City: An Evaluation Report. Washington, D.C.: Police Foundation.

Press, S. James
1971 Some Effects of an Increase in Police Manpower in the 20`" Precinct of New York City. New York: New York City Rand Institute.

Rosenfeld, Richard and Scott H. Decker
1996 Consent to search and seize: Evaluating an innovative youth firearm suppression program. Law and Contemporary Problems 59:197-220.

Sampson, Robert J. and Jacqueline Cohen
1988 Deterrent effects of the police on crime: A replication and theoretical extension. Law and Society Review 22:163-189.

Schnelle, John F., Robert E. Kirchner, Jr., Joe D. Casey, Paul H. Uselton, Jr., and M. Patrick McNees

1977 Patrol evaluation research: A multiple-baseline analysis of saturation police patrolling during day and night hours. Journal of Applied Behavior Analysis 10:33-40.

Schnelle, John F., Robert E. Kirchner, Jr., J.R. Lawler, and M. Patrick McNees
1975 Social evaluation research: The evaluation of two patrol strategies. Journal of Applied Behavior Analysis 8:232-240.

Shaw, James W.
1995 Community policing against guns: Public opinion of the Kansas City Gun Experiment. Justice Quarterly 12:695-710.

Sherman, Lawrence W.
1990 Police crackdowns: Initial and residual deterrence. In M. Tonry and N. Morris (eds.), Crime and Justice: An Annual Review of Research, Vol. 12. Chicago, Ill.: University of Chicago Press.
1992 Attacking crime: Policing and crime control. In M. Tonry and N. Morris (eds.), Modern Policing. Chicago, Ill.: University of Chicago Press.
1998 Cooling the hot spots of homicide: A plan for action. In What Can the Federal Government do to Decrease Crime and Revitalize Communities? Washington, D.C.: National Institute of Justice and the Executive Office for Weed and Seed.

Sherman, Lawrence W. and Dennis P. Rogan
1995 The effects of gun seizures on gun violence: "Hot spots" patrol in Kansas City. Justice Quarterly 12:673-693.

Sherman, Lawrence W. and David A. Weisburd
1995 General deterrent effects of police patrol in crime "hot spots": A randomized controlled trial. Justice Quarterly 12:625-648.

Sherman, Lawrence W., James W. Shaw and Dennis P. Rogan
1995 The Kansas City Gun Experiment. Washington, D.C.: National Institute of Justice.

Sherman, Lawrence W., Denise Gottfredson, Doris MacKenzie, John Eck, Peter Reuter, and Shawn Bushway
1997 Preventing Crime: What Works, What Doesn't, What's Promising. Washington, D.C.: Office of Justice Programs.

Weiss, Alexander and Sally Freels
1996 The effects of aggressive policing: The Dayton traffic Enforcement Experiment. American Journal of Police 15:45-64.

Whitaker, Gordon P., Charles D. Phillips, Peter J. Haas, Robert E. Worden
1985 Aggressive policing and the deterrence of crime. Law and Policy 7:395-416.

Wilson, James Q.
1968 The urban unease: Community vs. city. The Public Interest 12:25-39.
1994 Just take away their guns: Forget gun control. New York Times March:46-47.

Wilson, James Q. and Barbara Boland
1978 The effect of the police on crime. Law and Society Review 12:367-390.

Zimring, Franklin E. and Gordon Hawkins
1998 Crime Is Not the Problem: Lethal Violence in America. New York: Oxford University Press.