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Measuring the Effectiveness of Crime Control Policies in Knoxville's Public Housing

Using Mapping Software to Filter Part I Crime Data

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Crime in Knoxville's public housing is an ongoing problem for the Knoxville Police Department and the Knoxville Community Development Corporation (KCDC). The purpose of this study is to determine whether public policies and programs that attempted to reduce crime in seven of Knoxville's public-housing developments were effective. They include (a) a "One-Strike" eviction policy, (b) the demolition of one housing project with funding from the Department of Housing and Urban Development's HOPE VI grant program, (c) a "team-based" approach to policing, and (d) a new residency-applicant-screening process. Descriptive statistics were generated by using Arcview mapping software to separate the yearly Part I serious crime incidents for 1996 to 2001 in two distinct geographical regions: (a) the area represented by the KCDC study sites where the policies were implemented and (b) the remainder of the City of Knoxville. Crimes of opportunity and property crimes were minimally affected by some of the policies at best, yet KCDC still has a more dangerous environment than the rest of Knoxville.

Keywords: *police; crime control; public housing*

Crime in Knoxville's public housing is an ongoing problem for the Knoxville Police Department (KPD) and the Knoxville Community Development Corporation (KCDC). KCDC is the independent corporation that manages all of Knoxville's public housing. Although the seven KCDC public-housing sites that are the focus of this study account for 1.5% of Knoxville's total households, 15% of the total reported aggravated assaults and 4.4% of the total reported Part I serious crimes in Knoxville occurred within the geographic areas represented by these sites in 1997. When one compares the 1997 percentage of violent crimes per number of households in the same seven sites with the percentage of crimes per households citywide,

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the KCDC developments had a higher ratio in five of seven violent crime categories (including aggravated assault, auto theft, burglary, robbery, and rape).

The purpose of this study is to determine whether public policies and programs that attempted to reduce crime in Knoxville's public-housing developments were effective. The policies and programs, which were implemented by KCDC and KPD, include

- a "One-Strike" eviction policy added to KCDC leases in September 1996;
- the demolition of the College Homes housing project in December 1998 with funding from the Department of Housing and Urban Development's (HUD's) HOPE VI grant program;
- a March 1999 team-based approach to policing that included several new policies; and
- a new residency-applicant-screening process in September 2000.

The seven family-oriented KCDC sites that are the focus of this research are Western Heights, Montgomery Village, Austin Homes, Walter P. Taylor Homes, Christenberry Heights, Lonsdale Homes, and College Homes (KCDC, 1998a).¹ See Appendix A for a map of their relative locations.

LITERATURE REVIEW

There is no single set of statistics that measures crime in individual or aggregate housing projects nationwide. As a result, scholars tend to study individual housing projects or all the projects within a single public-housing authority (PHA) (Popkin et al., 1995). Despite this lack of comprehensive data, policy makers and law enforcement officials agree that crime is at its highest levels in public-housing communities (Hellegers, 1999).

Holzman (1996) is of the opinion that very few researchers have empirically examined crime in public housing. Although some have noted that crime is prevalent around or in public housing, they have ignored the unique nature of public housing as an institution and are unaware of its physical nature and administrative processes. Unfortunately, criminal justice research is dampened because many police executives believe that PHAs belong to the federal government and that PHAs do not cooperate with police. For Holzman (1996), crime in public housing should be studied due to public housing's history, its unique population, and the problems it creates for law enforcement agencies.

The policies intended to control crime in Knoxville's public housing are representative of law enforcement trends nationwide. For example, the physical safety improvements (e.g., the addition of security lighting and fencing)

made to the KCDC sites primarily during the late 1980s were based on the theories of Crime Prevention Through Environmental Design (CPTED), which evolved from the theories of situational crime prevention of the 1960s (e.g., Jacobs, 1961; Jeffery, 1971; Merry, 1981; Newman, 1972; Taylor & Harrell, 1996).

Studies of public housing in New York, Boston, and San Francisco conclude that comprehensive or combination approaches to crime control are the most effective in reducing crime in public housing (Popkin et al., 1999). The Public Housing Drug Elimination Program (PHDEP), which funded all of the policies and programs to be evaluated by this study, originated from the Anti-Drug Abuse Act of 1988. PHDEP was a comprehensive program, providing funding for law enforcement, tenant participation, social services (particularly drug prevention and intervention services), security measures, tenant screening, and better PHA management practices (Popkin et al., 1995). By simultaneously using PHDEP and the HOPE VI grant program (used by PHAs for demolition purposes), PHAs and HUD hoped to ameliorate poor building conditions while promoting social cohesion, public safety, and self-sufficiency (Popkin et al., 1999).

Despite mixed results in numerous studies of the effectiveness of CPTED measures alone (e.g., Merry, 1981; Popkin et al., 1999; Taylor & Harrell, 1996), these researchers have consistently found a linkage between large, densely populated public housing and crime. The current trend in public-housing management, as demonstrated by the removal of College Homes in Knoxville, is to demolish problematic public-housing sites and to build single-family homes (Holzman, 1996).

The 1980s and early 1990s were also characterized by aggressive law enforcement policies at all levels of government and during all phases of criminal procedure. Seizures of property under the 1984 Comprehensive Forfeiture Act, the 1986 Anti-Drug Abuse Act, the formation of the Office of National Drug Control Policy in 1989 (Grinc, 1998), and the spread of sentencing policies such as Three-Strikes, Truth-in-Sentencing, and new mandatory minimums (Barbrey & Clement, 2001) are a few examples. As the reader will see, many of the policing tactics employed by the KCDC Security Patrol could be characterized as aggressive law enforcement.

Many academics and police administrators argue that community policing represents a fundamental shift in the underlying philosophies of policing, from the crime control model to one of problem solving and officer and community empowerment (Zhao & Thurman, 1997). Officers are encouraged not only to deal with the immediate problem (i.e., a call for service) but also to find a long-term solution so the problem does not reoccur. When police act cooperatively with citizens to solve community problems, proponents of community policing argue that the police reinforce the informal control

mechanisms of the community upon itself. This results in the reduction of citizen fear, increased police visibility, crime reduction and deterrence, and more accessibility to the public by the police (Grinc, 1998; Kane, 2000). It is clear that examples of both the crime control model and the order maintenance model existed in the policies of the KCDC Security Patrol. The 1999 team-based approach to policing was an example of officer problem-solving techniques.

Community policing means different things to different police agencies. Options can include foot and bike patrols; order maintenance, or cleaning up neighborhoods and revitalizing areas; or using "canned," neighborhood crime-prevention programs such as DARE or Neighborhood Watch (Maguire et al., 1997; Zhao & Thurman, 1997). The KPD has a nationally recognized community policing program, and community policing jargon is incorporated into all KPD policies. Knoxville may be unusual when compared to other cities because of the principle/agent relationship between the city police department and the PHA. However, the policies and practices of the KCDC Security Patrol are standard in community policing programs in other cities around the country, such as Chicago (Lurigio & Skogan, 1994) and North Little Rock, Arkansas (Elliot, 1996).

Much of the law enforcement policy research from the 1990s focused on drug enforcement, but studies of large-scale federal drug crackdowns, crop eradications, and interdictions found mixed results about the effectiveness of aggressive enforcement tactics (Sherman et al., 1997; Grinc, 1998). However, some city-specific studies said that directed efforts against social-order crimes (i.e., graffiti, litter, broken windows) (Skogan & Hartnett, 1997) and crimes in specific locations (Sherman et al., 1997) could be somewhat effective.

Other researchers in the late 1990s, such as Jurison and Williams (1997), said that housing projects should control whom they admit as tenants, and they must get rid of problem tenants (via eviction through some system of infractions or an escalating system of warnings). KCDC and KPD tried to do both with the One-Strike eviction policy and new applicant screening.

THE KCDC SECURITY PATROL

Drug activity in KCDC developments reached noticeable levels in 1987, with open drug sales from sidewalks. By the summer of 1988, buildings scheduled for modernization by KCDC were repeatedly burglarized and vandalized (KCDC, 1998c).

Initially, KCDC drew on the experiences of other housing authorities and the advice and assistance from the KPD to stop the drug dealers. Residents were encouraged to participate in Neighborhood Watch programs and the

new Resident Council. KCDC staff received crime awareness and prevention training. Internal KCDC procedures were reviewed, including the admission standards and lease enforcement. There was a renewed focus on drug prevention through educational and social programs that provided an alternative to the drug culture (e.g., Knoxville's Recreation Department programs, Just Say No Clubs) (KCDC, 1989).

During the late 1980s, the tenets of CPTED were the basis of several physical security measures. Properties that were overgrown with vegetation and adjacent to KCDC housing were cleared by the City of Knoxville. The city also placed barricades to either close streets or make them one-way, thereby preventing drug buyers from driving through the housing sites (KCDC, 1989). Instead of using chain-link fencing that created a prison appearance and that was comparatively easy to damage, KCDC decided to install wrought iron fencing in 1989 (KCDC, 1998c).

The captain in charge of KPD's Crime Prevention Unit met with a municipal court judge in 1989 to discuss methods of reducing vandalism and thefts related to construction in Austin Homes. KCDC's No Trespass List policy evolved from these meetings. First, the judge agreed to escalate the penalties for repeat trespassers in the construction area (Green, personal interview, April 16, 2002). Second, signs were posted around Austin Homes, warning people not to trespass. Those ignoring the signs were initially given oral warnings, and nonresidents were given written notices (Green, 2001). By fall of 1989, the KCDC buildings slated for renovation were modernized and reoccupied, and directed patrols and enforcement efforts by the KPD were successful at forcing street dealers to no longer conduct visible sales from sidewalks within the KCDC properties.

KCDC then tried to take the initiative in reducing drugs in public housing by implementing a comprehensive pilot program in Walter P. Taylor Homes. In addition to the physical safety measures tried elsewhere, the program included the use of KPD officers to patrol the development 24 hours a day, in two-man walking patrols. KPD used No Trespass letters to place nonresidents on notice not to return. The development's gymnasium became the site of a new Boys and Girls Club, which provided counseling and training opportunities for parents and teens. KCDC created a GED and Self-Sufficiency Resident Training Program. The pilot program plans specifically stated that the final phase of the program would be the expansion of its components to other developments and the securing of additional external funding (KCDC, 1989).

Given the anecdotal success of directed enforcement efforts in other public-housing sites and the pilot program in Taylor Homes, KCDC began using its operating funds budget and modernization monies at the end of 1989 to pay for the deployment of off-duty KPD officers in the seven KCDC

study sites. Officers began by photographing and videotaping vandalism and narcotics sales (Green, 2001).

During the fall of 1989, HUD offered PHDEP grant funding for the first time. Despite some success in reducing drug activities in specific locations, KCDC and KPD believed that drug dealing and violent crime were still rampant in Knoxville's public housing based on the level of calls for service and drug-related shootings. KCDC applied for the new grant by detailing the KPD/KCDC cooperative efforts between 1988 and 1989 and by using a problem assessment that contained anecdotal and statistical information (KCDC, 1989). KCDC was compiling the PHDEP grant application at the same time the Taylor Homes pilot program was implemented.

KCDC received its first PHDEP grant monies in 1990 (for fiscal year 1989), with \$89,000 allocated to CPTED strategies (primarily fencing) and \$161,000 for law enforcement (KCDC, 2001). KCDC already had support from KPD, so KCDC simply used the new PHDEP monies to pay for the use of KPD officers and equipment. A KPD captain was assigned to coordinate the off-duty KPD officers who would work in the seven family-oriented sites. At the outset of the KPD/KCDC arrangement, the KPD off-duty officers were paid as KCDC employees (Green, 2001). In 1990, the officers officially became known as the KCDC Security Patrol (KCDC, 1998a).

KCDC could have contracted with a local security firm, formed its own security staff, or used a tenant patrol. The 1989 PHDEP grant application summarized KCDC's reasoning:

We believe the problem required individuals well trained in law enforcement techniques; knowledgeable in applicable laws; armed but experienced in the when, where, and how of the use of arms, and especially experience in restraint of their use; "street-wise" about the problem that existed; and capable of making on-the-spot arrests. Only KPD officers met this description. (KCDC, 1989)

While working in the KCDC sites, KPD officers were agents of KCDC in a security role. They were not supposed to respond to calls for police service outside of the developments, nor were they supposed to provide police services within the sites, that is, making arrests (Hazelwood, personal interview, March 2, 2002). Calls for police services within KCDC developments were to be handled by regular KPD patrol officers, unless none was available or an immediate response was necessary (e.g., a patrol officer calls for assistance) (Hazelwood, 1999).

It is important to note that much of what the Security Patrol did within the KCDC developments would not be legally possible unless the streets within the sites were private property, or if the KPD officers were not acting as pri-

vate agents of KCDC. Specifically, KPD officers would not have sufficient probable cause to stop a citizen and demand to see identification on a public street, nor would they be able to charge an otherwise law-abiding citizen with trespassing or approach an individual with a drug-detection dog.

College Homes was the first site that KCDC sought to make private property. It leased the streets within the housing development from the City of Knoxville in August 1990. Beginning in 1991, No Trespass signs were installed in all of KCDC's family developments. KPD and KCDC agreed in 1991 that anyone arrested for narcotics offenses or repeat order-maintenance crimes (i.e., public drunkenness, vandalism, prostitution, etc.) would be evicted by KCDC and would receive a written notice by mail not to return. Those who received the notices were placed on the No Trespass List (Green, 2001). Since 1991, KCDC used PHDEP funding to give photo-identification cards to all of its residents. The Security Patrol then used walking and bicycle patrols, as well as ID checkpoints at entrances to identify anyone on the property (KCDC, 1997b). The Knoxville City Council officially privatized the streets, sidewalks, and other areas in the remaining family-housing sites on October 14, 1992 (*Thompson v. Ashe*, 1997).

ONE-STRIKE EVICTION POLICY

KCDC leases, like other residential lease agreements, contained expectations for resident and guest behavior. Residents could be evicted for any behavior that threatened the life, health, safety, property, or peaceful enjoyment of the property of the other residents. However, KCDC lease agreements had several additional penalties. Residents could be penalized or evicted not only for crimes they committed but also for crimes committed by their guests. Based on the One-Strike public housing eviction policy advocated by the Clinton Administration in 1996, and due in part to the purpose of the PHDEP grant, residents could be evicted for any drug-related offense or involvement in drug activity of any kind, inside or outside KCDC property. The One-Strike policy was officially incorporated into KCDC's lease agreements on September 1, 1996 (KCDC, 1998a). A resident did not have to be convicted of a drug-related crime; he or she had only to be charged with one. Any criminal activity by a resident or a guest was documented with a security report and was forwarded to the relevant KCDC development manager, who made the eviction decisions (Hazelwood, 1999).

COLLEGE HOMES AND HOPE VI

KCDC applied to HUD's HOPE VI grant program in 1997 with the goal of demolishing College Homes and building mixed-income housing in the his-

toric Mechanicsville area (KCDC, 1997a). Built during the Roosevelt era, College Homes occupied 15 acres, with 24.6 units per acre in a square, two-story, brick, bunker-style design. College Homes was becoming extremely expensive to physically maintain by the late 1990s. The design of the development and the topography of the site prevented KCDC from meeting Americans with Disabilities Act standards and local fire codes. The style of windows prohibited air circulation, and the buildings also lacked insulation. The walls sweated and the original terra cotta tile roofs leaked. It would take KCDC's entire capital-improvement grant funding for 5 years to modernize College Homes, at an estimated cost of \$24.2 million (KCDC, 1998b).

To prevent crime, concrete barricades and wrought-iron fencing were installed, yet the site's design prevented the creation of "defensible space" and the installation of surveillance cameras. The barriers served only to isolate the development from the surrounding neighborhood. Several of the buildings did not receive more than 3 hours of sunlight per day (KCDC, 1998b). Not surprisingly, the development was an easy target for predatory criminals, and KCDC found it impossible to get families to live there. According to one KCDC analysis, College Homes residents were 8 times more likely to be assaulted than residents elsewhere in the city, and the development had 20 times as many drive-by shootings than the Knoxville average (KCDC, 1997a).

After environmental review, the demolition application for the existing buildings was approved on July 1, 1998. Demolition began in December 1998 and was completed before the end of winter. College Homes would be replaced over a period of 4 years with 132 two-family rental duplexes and mixed-income single-family homes. An additional 123 houses would be built in the surrounding Mechanicsville neighborhood. The replacement dwellings would be in the form of individual, residential homes in several architectural styles to mimic a traditional neighborhood. The total cost of the development project was \$42.8 million (KCDC, 1998b).

THE TEAM-BASED APPROACH

In March 1999, a KPD sergeant became the new KCDC coordinator.² He implemented a team-based approach, permanently assigning one KPD sergeant (or other supervisory rank) as Security Patrol supervisor for each of the six remaining KCDC housing developments.³ Two more KPD officers were funded by PHDEP to patrol the six KCDC sites by day (one officer per three sites). The supervisor for each site was allowed to select and train the other officers who would be permanently assigned to his or her development. The new coordinator selected team members who were typically "go-getters and outgoing officers" who worked in patrol beats around the KCDC sites and

who were thereby familiar with the surrounding neighborhoods. Security Patrol site supervisors earned extra overtime pay for their administrative duties. The result was a team of officers at each KCDC site who worked well together and who always worked at the same location. The new coordinator believed that this new arrangement would permit Security Patrol officers and KCDC residents to become familiar with each other (Hazelwood, personal interview, March 2, 2002).

Based on his previous military training, the new coordinator wanted to create standard operating procedures (SOP) to formalize the new team-based approach. He had three primary goals: (a) the identification and removal of non-residents, (b) documentation of crimes involving residents or their guests, and (c) order maintenance (Hazelwood, 1999). The written SOPs clearly stated, "Public housing does not mean open to the public" (Hazelwood, 1999; Hazelwood, personal interview, March 2, 2002).

The notion of order maintenance was included in the new SOPs to address physical property conditions and public-order crimes that create an overall environment conducive to drug-related and serious crimes. Officers were supposed to notify KCDC management of litter, broken windows and doors, abandoned vehicles, graffiti, and so on. Of particular concern were visible street crimes, such as public drunkenness, vandalism, prostitution, and loitering (Hazelwood, 1999).

Security Patrol officers were encouraged to make regular "contacts" within the KCDC developments, and this served as the basis for their performance evaluations. A contact was defined as an arrest, citation, or security report. Site supervisors were responsible for submitting monthly reports showing the total numbers of contacts for their sites. When a potential problem resident was identified, injured or off-duty KPD investigators watched the resident for illegal activities or conducted a "knock and talk." A knock and talk is exactly what it sounds like—knock on the person's door and ask him or her questions or for permission to search the premises, based on a resident complaint or observed suspicious behavior. Officers were not concerned with gathering evidence so individuals could be convicted of a crime *per se*. Rather, officers wanted only to find enough evidence of a crime that would allow problem residents to be evicted under the One-Strike policy or that would permit individuals to be placed on the No Trespass List. Consequently, many of the individuals appearing on the No Trespass List and those who were evicted were caught with some small form of drug paraphernalia (Hazelwood, personal interview, March 2, 2002).

Nevertheless, officers were discouraged from using citations for minor offenses (e.g., a broken car taillight) when residents were involved, particu-

larly if the offense was unrelated to public-housing crime. In the new coordinator's opinion, without officer discretion for the enforcement of minor offenses, it would be impossible to foster good resident-KPD relations (Hazelwood, personal interview, March 2, 2002).

NEW APPLICANT SCREENING

Until 2000, KCDC had an internal policy that required a background check through National Crime Information Center (NCIC) for new residency applicants only if the applicant had not lived in Knoxville for 3 years. This was a simple "yes/no" screening process that did not include a check for local crimes. After several months of persuasion by KPD, KCDC relinquished the task to KPD in September 2000. All KCDC applicants were then subjected to a detailed criminal-record check within 48 hours of submitting an application. Several criminal databases were reviewed, including NCIC, a sex-offender registry, the Knox County computer database of records and reports (primarily for juvenile offenders), a check for local offenses in Knoxville and Knox County, and a comparison to the KCDC No Trespass list. All public-housing residents over the age of 16 were screened, but only those over the age of 18 were screened through the sex-offender registry. After screening, the KCDC coordinator or his assistant would make a recommendation to KCDC to deny or admit the applicant (Hazelwood, personal interview, March 2, 2002).

The KCDC coordinator developed a list of denial criteria based primarily on President Clinton's 1996 One-Strike policy. Membership on the No Trespass List, as well as criminal records containing sex offenses, murder, and attempted homicide, resulted in an automatic denial recommendation. Any drug possession or paraphernalia charge, aggravated assault, or two or more simple assaults within 3 years of the application date; or charges for the manufacture, sale, or delivery of controlled substances within 10 years were also grounds for denial. Other violent felonies and multiple public-order crimes (e.g., disorderly conduct or prostitution) committed within 3 years of the application date were reviewed on a case-by-case basis (Hazelwood, 2000).

When making denial recommendations, the coordinator and his assistant were not swayed by the fact that an applicant may not have been convicted of a particular crime, and they typically chose to err on the side of caution. For example, an applicant might be denied by simply appearing in a police report on the local database for misdemeanor drug possession, but the criminal case could in fact have been dismissed (Hazelwood, personal interview, March 2, 2002).

Anticipated Findings

The team-based approach of 1999 should reduce crime in all of the KPD-patrolled projects for two reasons. First, officers and residents would become more familiar with each other, thereby allowing officers to identify those who are not residents. Second, the officers should develop a sense of ownership for their assigned projects, and the residents might be more willing to cooperate with officers they regularly meet.

The One-Strike eviction policy of 1996 and the applicant-screening policy of 2000 should result in reduced crime because they would allow the detection and removal of problem tenants. The demolition of College Homes in 1998 should intuitively result in a decrease in crime.

DATA AND METHOD

This research proceeded in two stages. The first stage was the collection of information about the changes in public policies and programs that have occurred in Knoxville since the late 1980s to control crime in the Knoxville's public housing. This information consisted of written grant applications, budget summaries, internal agency policies and procedures, and crime reports from KCDC and KPD. Information was also collected through informal meetings lasting 1 to 2 hours with key KPD and KCDC staff.

The second stage in this research was the compilation of descriptive statistics based on individual crime incident data from 1996 to 2001 for the City of Knoxville. The raw database from KPD was separated into individual years using Microsoft Access. It was then corrected and filtered for analysis using Arcview 3.2 mapping software. Once errors were removed, there was an average of 10,213 Part I incidents per year in Knoxville.

Traditional measures of police effectiveness typically include crime statistics about the locations, types, and frequencies of crimes. Reductions in the number of calls for service or reported crime are seen as indicators of a solved problem (Kessler & Duncan, 1996). In addition, multiple studies of crime control measures use customer-satisfaction or victimization surveys to gauge policy effectiveness or to measure factors such as "cultural social isolation" and "social disorganization" (e.g., Gwaisda et al., 1997; Sampson & Wilson, 1998).

A multiyear study of residents in Chicago housing projects is illustrative of the problems faced by researchers wanting to collect information about public housing. A telephone survey could not be used due to the high percentage of residents' not having phones. Poverty, illiteracy, and the fact that PHA records do not yield reliable mailing lists make a self-administered mail survey problematic. A face-to-face survey was preferable, but conducting inter-

views in residents' homes created safety concerns (Gwaisda et al., 1997). Most important for this study, available resources did not permit the use of a survey.

KPD has extensive crime data, including calls-for-service (from the 911 system), Part I reported serious crimes, and Part II Index reported nonserious crimes. Part I data were used for this study for several reasons. First, Part II data were compiled by KPD in a separate database that would have required considerable time, effort, and expense (in terms of staff resources) for KPD to retrieve, which made KPD unwilling to provide the Part II data. KPD was willing to share their Part I data at no cost because KPD has a highly trained computer and Geographic Information System staff that regularly analyze the Part I data, which made it readily available. In return for the free data and assistance from KPD staff, KPD would receive copies of the new incident-location map themes after I spent weeks removing incorrect address entries.

Second, Part I crimes are commonly used in the criminology literature. Serious felony crime is the basis of most federal law enforcement policy, and it is regularly reported by local law enforcement agencies to the FBI for its yearly Uniform Crime Reports. One could argue that Part II data would be more appropriate for this study, as the implemented policies could likely have a greater impact on social-order crimes such as prostitution, or vandalism. Indeed, the primary purpose of the PHDEP grant was the elimination of offenses involving illegal drugs. Nevertheless, KCDC's PHDEP applications justified its need for the additional federal funding by relating how drug crimes in Knoxville's public housing were causing increases in Part I crimes, particularly in terms of aggravated assaults. From an organizational standpoint for KPD and KCDC, policy success would be judged in terms of impact on Part I crimes.

Ideally, the time frame for this study should begin in 1987 when KCDC began exploring CPTED measures or in 1989 when the KPD/KCDC contractual relationship began to evolve. The initial timeframe was 1992 to 2001 because KPD's data prior to 1992 existed in another computer operating system, and the earlier data required extensive manipulation to make them useable. Although data from 1992 to 1995 were originally included in the analysis, data prior to 1996 were not useable for descriptive statistics due to a methodological problem that occurred during the data-collection phase within the KPD. Specifically, all assaults between 1992 and 1995 had been coded incorrectly as aggravated assaults in the KPD database.⁴

Reducing the time frame to 1996 to 2001 solved several problems. First, it eliminated the methodological concern. Second, the list of implemented policies grew from an initial four to a total of seven policies during the first stage of the research. By reducing the time frame, the list of policies to be evaluated

was shortened, with 2 years (1996 and 2000) probably seeing no discernible policy effects due to the timing of the implementations.

For each incident of crime in the KPD database, there is an associated street address, a description of the crime, time of day, day of week, month, KPD traffic zone where the incident occurred, and several other identifiers that were not used. The Arcview software allows the user to place a "pin," a dot, or other graphical characters at the geographical location of any variable the software recognizes (e.g., a physical street address, or *X,Y* map coordinate). Because the KPD database contains only street addresses, KPD also provided an Arcview compatible map layer, or "theme," that contains a pin at the location of every street address in the City of Knoxville. Arcview matched the addresses in this theme to the addresses in the database to create pin maps showing the location of every crime in Knoxville for which it recognized an address.⁵

One map theme created by KPD shows the boundaries of the KPD traffic zones, which are used for personnel assignments and data-collection purposes. This theme was vital to the analysis because KPD created a separate traffic zone representing the perimeter of each KCDC housing site protected by the Security Patrol (represented by the polygons in Appendix A). Consequently, this map layer shows the physical boundaries of the policy implementations. By using the Arcview software to identify the separate incidents of crime by type that occurred within the KCDC study sites (as determined by the traffic zones), comparisons could be made between the levels of crime in the KCDC sites and the levels of crime in the rest of the Knoxville to determine whether the policies were effective. Example maps of how this was accomplished are included in Appendix B.

After obtaining the total number of crimes per year by type in the city (KCDC included) and for KCDC separately, the latter was subtracted from the former to calculate the number of incidents occurring in the population of Knoxville outside public housing. The incident-count data are shown in Appendix C. Using the data for the types of incidents, percentage changes were calculated in Table 1 for the two separate geographic regions.

Ideally, crime rates should be calculated for the two regions using the ratio of number of crimes to population. Population data for the entire City of Knoxville could be estimated from 1990 and 2000 census data. Unfortunately, population data for the KCDC study sites alone were available for only two years from KCDC. KCDC uses an Internet site to report resident census-type information to HUD, and the same site generates printed reports. During the research stage of this study, KCDC could use the system only to generate data for 1999 and 2000 (White, personal interview, February 18, 2002).⁶

TABLE 1*Percentage Change in Crime Types by Year for KCDC and City (KCDC exclusive)*

	1996	1997	1998	1999	2000	2001
KCDC only						
Aggravated assault (%)	-66.1	3.1	-15.9	12.6	-28.8	29.2
Auto theft (%)	-33.0	-7.9	0.0	0.0	19.0	-36.2
Burglary (%)	-23.3	-12.0	-18.2	-5.6	16.5	-10.1
Larceny (%)	-21.0	3.4	-13.9	-10.8	17.2	-11.8
Murder (%)	-25.0	-33.3	50.0	-66.7	400.0	-50.0
Rape (%)	0.0	-28.6	60.0	-37.5	80.0	33.3
Robbery (%)	-15.0	-43.1	20.7	-20.0	42.9	-2.5
% change of total crime	-41.30	-6.90	-10.70	-3.90	6.70	-5.60
City (KCDC exclusive)						
Aggravated assault (%)	-63.8	0.6	0.3	-14.1	2.8	62.4
Auto theft (%)	-8.5	-4.2	-17.3	7.2	5.6	-10.6
Burglary (%)	-16.4	-12.7	-19.3	-16.2	-22.6	59.8
Larceny (%)	-9.8	15.3	-5.2	-7.2	5.2	-4.8
Murder (%)	31.3	-19.0	82.4	-38.7	-10.5	-17.6
Rape (%)	-40.6	50.9	-18.6	-10.0	6.3	82.1
Robbery (%)	-17.9	-4.4	-2.1	7.1	-23.1	44.2
% change of total crime	-19.90	4.40	-8.90	-6.70	-0.60	9.10

Several of the PHDEP grant applications from KCDC included a calculation for a rate of crime occurrence, or the ratio of crimes to the number of households. The number of households for the City of Knoxville was estimated using 1990 and 2000 census data.⁷ KCDC reports for 1999 and 2000 contained the total number of units in each housing site and the total number of occupied units. An average number of occupied units was used to represent the number of KCDC households.⁸ To ensure that KCDC occupied units was roughly equivalent to the census data for households, average family size for Knoxville in 2000 (2.12) was compared with the average family size in the KCDC reports (2.44) (KCDC, 1999; KCDC, 2000; American FactFinder, 2002).⁹ The rate of occurrence of crime is reported in Table 2, using the estimates for the number of households and the number of crimes from Appendix C.

FINDINGS

Completely analyzing the descriptive statistics for each type of crime is not entirely useful, given the small number of incidents per year. Table 2 reveals that murders and rapes in both KCDC and Knoxville were rare occurrences when compared with the other types of Part I serious crimes. Both murder and rape tend to fluctuate independently of the other crime variables, some-

TABLE 2*Rate of Occurrence of Part I Crime by Type for KCDC and City (KCDC exclusive)*

	1996	1997	1998	1999	2000	2001
KCDC (no. of incidents/ no. of households)						
Estimated households	2,204	2,204	1,958	1,958	1,958	1,958
Aggravated assault	0.0581	0.0599	0.0567	0.0638	0.0455	0.0587
Auto theft	0.0286	0.0263	0.0296	0.0296	0.0352	0.0225
Burglary	0.0567	0.0499	0.0460	0.0434	0.0506	0.0455
Larceny	0.0662	0.0685	0.0664	0.0592	0.0695	0.0613
Murder	0.0014	0.0009	0.0015	0.0005	0.0020	0.0010
Rape	0.0032	0.0023	0.0041	0.0026	0.0046	0.0061
Robbery	0.0231	0.0132	0.0179	0.0143	0.0204	0.0199
Total	0.2373	0.2210	0.2222	0.2135	0.2278	0.2150
City (KCDC exclusive) (no. of incidents/ no. of households)						
Estimated households	74,057	74,761	75,471	76,188	76,650	77,378
Aggravated assault	0.0096	0.0095	0.0095	0.0080	0.0082	0.0132
Auto theft	0.0207	0.0197	0.0161	0.0171	0.0180	0.0159
Burglary	0.0299	0.0258	0.0206	0.0171	0.0132	0.0208
Larceny	0.0696	0.0795	0.0746	0.0686	0.0717	0.0676
Murder	0.0003	0.0002	0.0004	0.0002	0.0002	0.0002
Rape	0.0008	0.0012	0.0009	0.0008	0.0009	0.0016
Robbery	0.0073	0.0069	0.0067	0.0071	0.0054	0.0078
Total	0.1381	0.1428	0.1289	0.1191	0.1176	0.1271

times varying dramatically from year to year (e.g., up 400% in KCDC in 2000), given the small number of incidents. However, occurrence rates of rape and murder are consistently higher in KCDC than in the city.

Comparing descriptive statistics from one year to another assumes that the effects of the individual policies occurred at discrete points in time and are observable in terms of impact on incidents of Part I crime. This assumption does not account for the compounding effects of multiple policy implementations on the crime occurrence rate over time, including the effects of policy and programmatic changes that occurred prior to 1996.

One could contend that crime fluctuations over time were caused by factors not related to public housing or to the policies being evaluated. At minimum, the list of other causal variables could include a wide range of socio-economic or demographic characteristics. The problem in Knoxville may be that there is little else KPD and KCDC can do to reduce crime in the KCDC sites. The physical nature of the sites and the types of residents who live there may be the direct causes of the crime problem.

The 2000 KCDC tenant characteristic report to HUD for all KCDC residents paints an interesting picture.¹⁰ Of the residents, 65% have extremely

low incomes, or below 30% of median. More than half (59%) of the residents have incomes between \$5,001 and \$10,000. More than 90% receive some form of income assistance (including TANF, Social Security, or pension). There are plenty of easy crime targets in KCDC, as 51% of the residents are over age 62 or are disabled. Although the KCDC population is racially diverse (48% Black and 52% White), 43% of household members are under the age of 18 (KCDC, 2000). The buildings are typically one- to two-story brick structures, with high population densities. Given these characteristics, one should intuitively expect to see higher crime rates within the KCDC sites.

An attempt was made to gauge the potential effects of known confounding events that occurred between 1995 and 1997. The highest level of funding for the Security Patrol occurred in 1995 and 1996 (see Table 3), which indicates that more officers were present at any one time, that the officers at each site worked more hours, or that it is a combination of both.

Unfortunately, data on the deployment level existed in the form of personnel timecards. Time did not permit the analysis of cards for hundreds of officers for 10 years, assuming KPD would be willing to allow access. According to the 1996-1998 PHDEP applications, 1995 to 1997 was the period in which KPD's enforcement efforts were supplemented by the FBI and Tennessee Bureau of Investigation, resulting in the arrests of several leaders of a Florida-based drug-trafficking ring based in part in the KCDC sites. Given the influence of the external actors and lack of data, it is unknown how much the external agencies affected crime in KCDC.

On one hand, it is impossible to separate the effects of the coinciding 1996 One-Strike policy, the increased law enforcement presence by external agencies in KCDC between 1995 and early 1997, and the highest level of grant funding that occurred during 1996. On the other hand, if the One-Strike policy had a separate effect from other events, the effect may remain during 1997 because the policy was implemented during September 1996, near the end of the external agencies' involvement. The policy was intended to reduce the number of problem tenants by simply evicting them from their residences within the study sites.

During 1997, KCDC saw a 6.9% decrease in total crime incidents and small total occurrence-rate reduction (-.0163). There was a coinciding 4.4% increase in the city's total crime incidents and an overall occurrence-rate increase (+.0047). Burglary (-.0068), auto theft (-.0023), and robbery (-.0099) did see minimal reductions in KCDC occurrence rates between 1996 and 1997, which could suggest an impact on crimes of opportunity. KCDC aggravated assault (+.0018) and larceny (+.0023) increased during 1997 in KCDC. For the city, burglary (-.0041), auto theft (-.001), and robbery (-.0004) fell less than KCDC; aggravated assaults remained virtually unchanged (-.0001);

TABLE 3
Public Housing Drug Elimination Program Grant Funding of the Security Patrol

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Dollars	161,000	291,400	544,729	466,131	799,000	788,004	809,570	943,819	727,654	804,520	553,865	651,893	755,020

SOURCE: Knoxville Community Development Corporation (2001).

and larceny rose (+.0099). The proportion of total citywide crime in KCDC fell from .0487 in 1996 to .0436 in 1997.

There are differing crime trends for the two populations in 1997. KCDC experienced overall reductions in the number of crime incidents, its proportion of total citywide crime, and a decrease in overall occurrence rates, while opposite trends occurred for the city. These findings suggest that the One-Strike policy was effective on crimes of opportunity and property crimes yet did not reduce aggravated assaults. However, to make this conclusion, one must assume that confounding variables (i.e., the external actors) were not causing the 1997 reductions in KCDC crime as compared with the city.

Demolition of College Homes began in December 1998, yet the policy impact should be in 1998 because KCDC began relocating residents as early as late 1997 (White, personal interview, February 18, 2002). Table 1 reveals that KCDC saw a total incident reduction of 10.7% in 1998, while the city experienced an 8.9% reduction. KCDC saw bigger reductions in aggravated assaults (–15.9%) and larcenies (–13.9%) than did the city (aggravated assault +0.3%; larceny –5.2%), but the city had a 2.1% reduction in robbery, while KCDC had a 20.7% increase. The city saw a much larger reduction (–17.3%) in auto thefts, while KCDC was unchanged, and the city had a slightly larger reduction (by 1.1%) in burglaries than did KCDC.

Table 2 demonstrates that the city experienced overall crime occurrence rate reduction in 1998, and either small reduction or stability in the occurrence rates for the different crime types, but KCDC saw opposite findings. The total crime occurrence rate for KCDC increased .0012 as compared with a small reduction (–.0139) for the city between 1997 and 1998. Auto thefts (+.0033) and robberies (+.0047) increased in KCDC to small degrees, while the rates for the same crimes fell slightly in the city (auto theft –.0036, robbery –.0002). Aggravated assaults fell in KCDC (–.0032), while the city remained unchanged. Burglary and larceny decreased similarly in both populations during the same term.

Drawing conclusions about the removal of College Homes is problematic. Table 1 shows that KCDC had larger reductions in aggravated assaults and larcenies than did the city, but the city had larger reductions in the other crime categories. Table 2 indicates that the city had occurrence rate reductions or stability in every category, while KCDC saw small increases or similar reductions. Tables 1 and 2 agree that KCDC seemed to experience greater reductions in aggravated assaults between 1997 and 1998, but the two tables disagree in terms of which population experienced less total crime.

In terms of crimes per households (Table 2), the demolition of College Homes appears to be ineffective on total crime, but it must be noted that the differences between the occurrence rates for 1997 and 1998 for the two popu-

lations are very small. All of the findings suggest that the policy may have a marginal impact on aggravated assaults in KCDC.

The implementation of the team-based approach in March 1999 was probably early enough in the year to have an impact on the 1999 crime levels. Table 1 shows that incidents of crime dropped 10.7% in 1998 in KCDC yet fell only 3.9% in 1999. This is inconsistent with a negative impact of the policy on overall crime. In addition, the city experienced an 8.9% reduction in 1998 and a 6.7% reduction in 1999. Crime-occurrence rates fell slightly overall between 1998 and 1999 (KCDC, $-.0087$; city, $-.0098$).

When one examines the occurrence rates for the different types of crimes between 1998 and 1999, a different pattern emerges for the two populations. The occurrence rates for burglary ($-.0026$), larceny ($-.0072$), and robbery ($-.0036$) fell between 1998 and 1999 for KCDC, yet aggravated assaults ($+.0071$) rose in 1999 and auto thefts remained unchanged. City aggravated assaults ($-.0015$) fell in 1999, burglary ($-.0035$) and larceny ($-.006$) rates were reduced at similar levels to KCDC, and city robbery ($+.0004$) and auto theft ($+.001$) slightly increased.

The city had a greater reduction in the total crime incidents and the total crime-occurrence rate than KCDC in 1999. However, burglary, larceny, and auto thefts fell similarly for the two populations, with KCDC seeing occurrence-rate reductions for property crimes that were slightly larger than the city rate reductions. In addition, the two populations exhibited different patterns for occurrence rates for crimes against persons, with city robbery increasing and aggravated assaults falling, while KCDC robbery fell and aggravated assaults rose.

The 1999 team-based approach to policing was intended to create a group of Security Patrol officers at each KCDC site who worked well together and who could develop a sense of trust with the residents by getting to know them. If the officers became familiar with individual residents, then this could explain the reductions in KCDC property crimes and crimes of opportunity, but it appears as though the new policy was ineffectual against the larger problem of aggravated assault.

The implementation of new applicant-screening procedures occurred in September 2000, which should appear as a reduction in crime in 2001. The total percentage change in overall crime increased by 6.7% in KCDC in 2000 but was reduced by 5.6% in 2001 in Table 1. The city experienced a decrease of 0.6% in 2000 that was followed by an increase of 9.1% in 2001. Occurrence rates in Table 2 for the two populations also include differences. During 2001, KCDC and the city saw decreases in rates for auto theft (KCDC, $-.0127$; city, $-.0021$) and larceny (KCDC, $-.0082$; city, $-.0041$), yet KCDC's decreased noticeably greater. Both had increases in aggravated assault (KCDC, $+.0132$; city, $+.005$). While the city's burglary ($+.0076$) and

robbery (+.0024) rates increased in 2001, KCDC's rates for burglary (−.0051) and robbery (−.0005) decreased.

All of the indicators for crimes of opportunity decreased in KCDC during 2001, while the city's occurrence rates for the same crimes either decreased less or increased. Aggravated assault increased for both, with KCDC experiencing a greater increase. In terms of property crimes, the new policy for screening applicants seems to be somewhat effective.

CONCLUSION

Although the 1996 One-Strike policy seems to have an effect on crimes of opportunity and property crimes, the confounding events of the mid 1990s, including the actions of external agencies, make it difficult to find an independent impact of the 1996 policy. There are also no clear conclusions that can be drawn from the removal of College Homes. If demolishing College Homes had an effect, it was a marginal impact on aggravated assaults at best, particularly when viewed in terms of the overall assumptions being made. The 1999 team-based approach to policing seems to be effective against crimes of opportunity and property crimes, whereas the new applicant-screening process of 2000 seems to reduce property crimes.

Despite all the time, energy, and money spent on the Security Patrol, Table 2 clearly demonstrates that KCDC and KPD still had a crime problem in 2001 in the public-housing study sites. Only larceny (.0676) remains above the .05 occurrence rate in the city in 2001, whereas aggravated assault (.0587) and larceny (.0613) continued to be problems for KCDC. Burglary in the KCDC sites fluctuated around the .05 level since 1996, dropping slightly to .0455 in 2001. When one considers that robbery occurred within KCDC at higher levels than the rest of the city, and aggravated assaults usually represent serious crimes against persons involving weapons, it is apparent that most of Knoxville's public housing was a dangerous environment in 2001.

There are several caveats that must be placed on this entire study. First, as noted in Note 5, crime-incident data on which this study is based still have an error rate (due to missing data) of 13%. Second, the descriptive statistics do not account for the compounding effects of multiple policies over time, or they do not account for possible diminishing returns of policies due to previous policies. Third, it is entirely conceivable that things might be worse in public housing if no policies were implemented to control crime between 1996 and 2001. Fourth, like other city-specific studies, the findings from this research may not yield useful inferences for other cities or PHAs.

KCDC installed a constant police presence in the study sites for 10 years by spending millions of dollars, and KPD used policing tactics that are not applicable to the general public. Nevertheless, the combination of disadvantaged

residents and the physical nature of Knoxville's public housing may simply create an environment conducive to crime that no amount of policy or programmatic change can alter.

APPENDIX A

Figure 1: Locations of the Seven KCDC Study Sites

APPENDIX B

Figure 2: All Part I Crimes in Knoxville (1997)

APPENDIX B Example Maps

Figure 3: Part I Crimes Intersecting Public Housing (shown as white dots)

Figure 4: All Murders in Knoxville (1997)

APPENDIX C
Calculation of Total Part I Crimes by Type by Year for City
(including KCDC), KCDC only, and City (KCDC exclusive);
KCDC Proportion of Total Crime

	1996	1997	1998	1999	2000	2001
City (including KCDC)						
Aggravated assault	836	844	825	738	719	1,138
Auto theft	1,599	1,530	1,276	1,364	1,448	1,277
Burglary	2,337	2,040	1,647	1,389	1,108	1,701
Larceny	5,299	6,093	5,762	5,341	5,631	5,349
Murder	24	19	34	20	21	16
Rape	64	91	78	68	76	134
Robbery	591	545	540	569	456	639
Total	10,750	11,162	10,162	9,489	9,459	10,254
KCDC only						
Aggravated assault	128	132	111	125	89	115
Auto theft	63	58	58	58	69	44
Burglary	125	110	90	85	99	89
Larceny	146	151	130	116	136	120
Murder	3	2	3	1	4	2
Rape	7	5	8	5	9	12
Robbery	51	29	35	28	40	39
Total	523	487	435	418	446	421
City minus KCDC = City (KCDC exclusive)						
Aggravated assault	708	712	714	613	630	1,023
Auto theft	1,536	1,472	1,218	1,306	1,379	1,233
Burglary	2,212	1,930	1,557	1,304	1,009	1,612
Larceny	5,153	5,942	5,632	5,225	5,495	5,229
Murder	21	17	31	19	17	14
Rape	57	86	70	63	67	122
Robbery	540	516	505	541	416	600
Total	10,227	10,675	9,727	9,071	9,013	9,833

NOTES

1. These sites are not the only Knoxville Community Development Corporation (KCDC) public-housing properties in Knoxville, but they are the only sites where the Security Patrol operates. Consequently, the other KCDC sites were not subjected to the policies that are the focus of this study. Other KCDC public-housing projects typically serve the elderly or handicapped and do not have large crime problems (Hubbs, personal communication, March 22, 2002). The study sites accounted for 71% of the total KCDC housing units in 2000 (KCDC, 1997a).

2. This sergeant left the Knoxville Police Department (KPD) in 2002 to manage the Public Safety Division in another Tennessee public-housing authority.

3. College Homes was demolished prior to the new Coordinator's appointment.
4. Removing improperly included simple assaults is not possible. One could subtract the total number of simple assaults to adjust the total number of aggravated-assault incidents and the total number of crimes, yet it is impossible to determine which individual incidents should be removed, making it impossible to subtract the correct number of KCDC incidents and non-KCDC incidents.
5. Because most of the errors in the database are due to misspellings or omissions (i.e., leaving the word *Pike* off an address on Middlebrook Pike; e.g., an entry reading "4005 Middlebrook"), approximately 25% of the raw database for each year had addresses with errors. By manually going through the incidents with address errors, I was able to drop the "No match" score from approximately 25% to 13% per year. No Match entries are those that the software could find an address "match score" less than 75 on a scale of 1 to 100. Although a missing data level or error rate of 13% will seem high to most social scientists, a database with this level of incorrect locations is common for Geographic Information System software users, particularly when street addresses are used to locate pins instead of specific X,Y map coordinates. The use of a global positioning system (GPS) at the data-collection phase (e.g., the KPD could install GPS units in their cruisers or radios) would eliminate the high error rate; however, the KPD and most local police agencies at present cannot afford or justify the necessary hardware (Hubbs, personal communication, March 22, 2002).
6. I could estimate KCDC population using the available information; however, I would be unable to account for the population of College Homes prior to its demolition in 1998, which was not reported.
7. <http://factfinder.census.gov/home>.
8. By using the total number of units per site and the number of occupied units for 1999 and 2000, the average number of occupied units (1,958 households) and an average occupancy rate (77%) was calculated for KCDC for the 2 years. College Homes consisted of 320 units; assuming 77% occupancy, it would contain 246 households prior to demolition. Given the average occupancy rate, using the total number of units to represent households was not appropriate. Consequently, I assumed 1,58 households (remaining constant) for 1998 to 2001. Because College Homes was demolished in December 1998 and some residents were relocated during 1997, I added the 246 households in College Homes to 1958 for each year between 1996 and 1997, equaling 2,204 households per year.
9. Other comparisons were not possible due to the limited amount of information from KCDC.
10. Including the KCDC residents who do not live in the study sites.

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