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C.A.S.T.L.E. Community Advocates for Safety together with Law Enforcement: St Louis County Community Based Crime Reduction Grant Final Report January 2023

Tammy R. Kochel
Southern Illinois University Carbondale, tkochel@siu.edu

Seyvan Nouri
Calilfornia State University Stanislaus, snouri@csustan.edu

Cory Haberman
University of Cincinnati, habermcy@ucmail.uc.edu

Bradley O'Guinn
University of Cincinnati, oguinnbj@mail.uc.edu

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Recommended Citation

Kochel, Tammy R., Nouri, Seyvan, Haberman, Cory and O'Guinn, Bradley. "C.A.S.T.L.E. Community Advocates for Safety together with Law Enforcement: St Louis County Community Based Crime Reduction Grant Final Report January 2023." (Jan 2023).

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C.A.S.T.L.E

Community Advocates for Safety Together with Law Enforcement

St Louis County Community Based Crime Reduction Grant

Final Evaluation Report

January 2023

Tammy Rinehart Kochel, PhD, Professor

Southern Illinois University Carbondale

With assistance from

Seyvan Nouri, PhD, Assistant Professor
California State University Stanislaus
Cory Haberman, PhD, Associate Professor
University of Cincinnati
Bradley O'Guinn, PhD candidate
University of Cincinnati

This project was supported by Award no. 2017-AJ-BX-003, awarded by the Bureau of Justice Assistance, Office of Justice Programs, U.S. Department of Justice. The opinions, findings, and conclusions expressed in this publication are those of the authors and do not necessarily reflect those of the Department of Justice.

Executive Summary

The CASTLE project began strong in 2018 with community participation (n=50 residents) in identifying and discussing the problems within the Castle Point neighborhood (CPN). They identified shots fired, feeling unsafe, illegal dumping, disorder, and speeding as the most important concerns. Responses were implemented in two phases. An early action plan involved an emphasis on illegal dumping and disorder and entailed community cleanups, adding cameras near vacant homes with high dumping, installing yard signs encouraging residents to keep the castle clean, sending letters to landlords, and refrigerator magnets with contact information for public works. Evaluation of the early action project showed a downward trend in calls for service for illegal dumping and abandoned autos, increased reporting for these offenses, and declines in the amount of physical disorder on CPN streets as well as the proportion of CPN residences with physical disorder.

After receiving approval from the U.S. Bureau of Justice Assistance on the implementation plan in August 2019, the first set of extra patrols were conducted, Art Works installed murals on several CPN homes, public works conducted extra cleanups, and dumpsters were installed temporarily. In Spring 2020, a bobcat was procured and the community alliance 501c3 was formed. Cleanups resumed in summer 2020 along with camera monitoring, the ArtWorks program for CPN youth, and mural installation. Directed patrols resumed in fall 2020. Doorbell cameras (n=100) were installed in March 2021, and additional murals were installed in summer 2021. The planned improved lighting did not occur during the project period. The COVID-19 pandemic, which began in March 2020 and steadily persisted for more than a year drastically impacted the planned initiatives and implementation timing and likely also affected the outcomes.

We examined the impact of these activities on shots fired, illegal dumping, and disorder, as well as on residents' perceptions of safety, crime, and police. There were mixed results, showing the most favorable impacts on disorder but no favorable impact on shots fired or residents' perceptions.

The directed patrols increased police presence during the treatment timeframes of 2, 4, and 8-weeks and CPN residents did report seeing police more frequently than comparison area residents over time. The treatment hot spots in CPN showed significant reductions in disorder calls for service during those times, about half the rate of the control spots during those same times. However, there was not a significant change in shots fired calls for service or ShotSpotter alerts. Also, we did not observe any significant differences in impact based on the duration of the hot spots treatment (2, 4 or 8 weeks).

Examining differences in CPN to the two comparison neighborhoods, we found that observed physical disorder in CPN declined significantly over time and while the comparison neighborhoods saw declines in the amount of physical disorder as well—the effects were not as large or consistent as in CPN. Likewise, in CPN, the proportion of homes on street segments that showed evidence of physical disorder was significantly lower in 2021 than in 2018, while the two comparison areas did not have these results. However, we did not find that the number of homes that showed clear signs of physical order (e.g., tidy landscaping, well secured and undamaged fences and gates) was significantly greater in 2021.

Furthermore, comparison area residents reported more favorable change than CPN residents between the start and end of the project on perceptions of police—police legitimacy, procedural justice, police injustice, and how police address illegal dumping. Comparison residents also reported significantly more favorable results for informal social control relative to CPN residents between 2019 and 2021.

The CBCR grant provided a unique opportunity for the CPN community to organize around their crime and safety concerns and to partner closely with the SLCPD and Department of Public Works. It also provided an opportunity to drastically improve efforts to address physical disorder. Nonetheless, numerous approaches designed to promote neighborhood collective efficacy and some other implementation strategies could not be implemented due to the COVID-19 pandemic. The pandemic also hindered community survey data collection efforts in 2020. In spite of these challenges, the project led to reductions in CPN in physical disorder by 2021 compared to baseline and relative to two comparison areas. Furthermore, disorder calls for service experienced significantly fewer disorder calls for service during the hot spots periods than control hot spots that received no change in policing services. However, no overall improvements in feelings of safety nor in experiences with shots fired can be documented from the efforts.

Project Description

The Community Advocates for Safety Together with Law Enforcement (C.A.S.T.L.E.) project, funded by the U.S. Department of Justice Bureau of Justice Assistance was a collaborative problem-solving effort in the Castlepoint neighborhood (CPN), led by the St. Louis County Police Department. Southern Illinois University Carbondale served as the research partner. The initiative entailed four phases. The Scanning phase entailed building partnerships and organizing stakeholders, establishing priorities for the project, and conducting an early action project to experience success and build momentum (April-June 2018). The analysis phase entailed examining a diverse amount of data to fully understand the nature of the crime and disorder problems within CPN (June 2018-March 2019). The response phase (April 2019-October 2021) entailed implementing responses that had been tailored to address the facilitators of the crime problems. The assessment phase involved evaluating the impact of the effort (November 2021-April 2022).

Targeted Neighborhood

CPN is a .42 square mile suburban community in North St. Louis County, Missouri. According to the U.S. Bureau of Census (which covers a slightly larger area than our study), CPN has a population of 3,084 living within 983 households; 92.7% of residents are Black, 5.3% White, .6% Hispanic, .3% Asian, 1.8% other or a combination of multiple races. Housing is 96.1% small single-family homes (800-1,200 square feet): single-story, wood-frame bungalows. Pushed by urban blight and gentrification and pulled by the prospect of safer communities and better schools, many African American families migrated from the City of St. Louis to the inner-ring suburbs of St. Louis County. CPN changed from a white, middle- and working-class community to a black working-poor community. CPN has a high proportion of single-parent households with children (43%), and the child poverty rate for the area is a disturbing 50%. Only 8% of CPN residents over 25 have a college degree, which is approximately one-third of the County

percentage (23.7%). Although CPN is only .72% of the total population in the jurisdiction, it accounts for more than double its share in Part I crime (1.6% of the total).

Project Planning

The C.A.S.T.L.E. project was a collaborative problem-solving initiative. Thus, two core components were engaging relevant stakeholders in the project and conducting a thorough examination of the crime and related problems in CPN to understand when, where, and why they happen, to be able to develop and implement tailored and effective responses designed to reduce the incidence and harm.

Collaboration, Organization, and Logistics

Project planning began in April 2018. Work was divided across a core management team (research partner, program coordinator, police liaison), a cross sector steering committee (research partner, program coordinator, community partners such as a local community development organization, a pastor of a church that is in CPN, several CPN residents), and the CPN residents at large. The core management team, composed of the project coordinator, police representatives, and research partner provided oversight, administration/logistics and management. The steering committee met monthly up until the COVID-19 pandemic in March 2020 to discuss current initiatives, resources and stakeholders in CPN, identify what we needed to learn during the planning period and who else should be involved, discuss the nature of the crime and safety problems in CPN as identified through our research partner's formal research methods, the drivers of those problems, and brainstorm potential innovative, evidence-based strategies to address the identified concerns in CPN. We held three planning meetings with the CPN residents at large (June and October 2018 and January 2019)—at which numerous steering committee members also attended. We invited residents to the first meeting by going door-to-door, distributing invitations, informing residents about the purpose of the grant, and building rapport. At this meeting, 50 adult residents signed the attendance log. We collected email and phone contact information, introduced the grant and what it seeks to do and how, collectively specified

neighborhood boundaries, and residents described the assets and problems in CPN. Residents voted on the priority problems and discussed what they believed were drivers of the problems.

Residents agreed that Castle Point Park is the primary asset of the neighborhood—a beautiful, family-oriented space with a number of activities such as basketball, community garden, and a splash pad. The community also values the elementary school, describing it as a safe haven and well maintained. Other assets include some street lighting, two churches, police presence, several daycare facilities, and Beyond Housing (a grass roots organization that owns a number of properties in CPN).

On a vote, CPN residents prioritized the top four problems in CPN as

1) Speeding vehicles
2) Shooting guns (e.g., driving down the street and shooting into the air)
3) Not feeling safe, especially at night
4) Illegal dumping

Other problems, including burglary and loitering, were also discussed.

A key driver of several of the problems, residents thought, was vacant and abandoned houses. They described several ways these homes pose a problem. Squatters and groups stay in the houses, they are a place for people to use drugs, for drug dealers to sell drugs, for people inside and outside of Castlepoint to dump stolen cars and unwanted household items and trash, to evade police when being chased, and a resource from which to steal copper and air conditioning units, destroying the houses. Residents perceive that homeowners abandon their homes when the sewer problems common to the area lead to flooding and other issues that cannot be resolved. Other perceived facilitators included lack of adequate street lighting, traffic flow, and easy access into the neighborhood from Chambers, resident anonymity and lack of cohesion, turnover of rental properties, minimal visibility due to low hanging tree limbs throughout the neighborhood, and landlord neglect that leads to homes in disrepair. Residents acknowledged that they did not expect police to resolve the issue, but high residential turnover and neighbors not knowing and interacting with one another was raised as contributing to many of the

problems in the area. As such, this suggested a possible solution to some of the problems—increasing interaction and community cohesiveness.

At the second neighbors' meeting in October 2018, residents were invited electronically, and 26 adult residents signed the attendance log. At that meeting, we sought feedback on an early action project to address illegal dumping, outlined the project timeline, and the research partner summarized preliminary findings about the nature of the identified priority problems, what analysis were planned in the near future, and asked residents some additional questions related to shots fired and burglary. The project coordinator opened the floor for resident questions and talked at length about the nature of Public Works activities in CPN.

The final neighbors' meeting during the planning phase, held in January 2019, focused on sharing the results of data analysis activities with residents, gaining their feedback and input on tailored solutions, and forming action committees. Residents were invited to that meeting via U.S. mail and electronically. Using multiple methods of contact was designed to ensure no one was omitted. Twenty-eight adult residents signed the attendance sheet.

After each community meeting, the project coordinator distributed meeting minutes electronically and provided any follow-up information requested by residents. Throughout the project, the project director maintained email correspondence with residents who provided their email on the attendance log.

Early Action Project

To build momentum in the community for the project, an early action project sought to address illegal dumping. In December 2018, yard signs and refrigerator magnets were provided to residents. The yard signs read "Help Keep the Castle Clean, Stop Dumping, See something, SAY something." They are pictured in figures 1 and 2 below. The slogan was developed by CPN teens. The magnets contained the same phrase, but also listed important numbers for the Problem Properties unit, Bulk Trash Pickup,

general information line for the county, and a nonemergency number. Also, that same month, the project director sent 265 letters to landlords of vacant properties requesting permission to enforce no trespassing on the property. However, all but ten letters were returned to sender. As part of the early action project, in March 2019, two video cameras with corresponding signs reading, “This property is protected by video surveillance. No dumping. Violators will be prosecuted,” were installed at dumping hot spots, and a license plate reader was installed at the busiest entrance to the neighborhood (based on a traffic study showing about 2500 vehicles using that access point daily). Public works cleanups and patrols persisted during this time. From January through July 2019, public works facilitated 172 cleanups within CPN. Twice in early summer 2019, dumpsters were placed in the neighborhood and residents were encouraged to use them. The goal of the early action project was to increase reporting about illegal dumping, increase arrests for illegal dumping, and reduce the amount of illegal dumping. The effort was successful. A full evaluation report of the early action project was submitted to St Louis County Police Department and the project team, thus for this report a summary of the early action project impact is provided in Appendix B. Results showed that the early action project activities improved CPN residents’ experiences with physical disorder, abandoned vehicles, and illegal dumping.

Figure 1. Refrigerator Magnet

Figure 2. Yard Sign

Analysis of the Problems

The evaluation team used a variety of data to diagnose problem locations and to better understand crime patterns and facilitators within CPN. We conducted a focus group with officers who work in CPN to discuss their opinions about the nature of the problems. They held numerous shared concerns with residents' priorities: gun shots, illegal dumping/blight, burglaries, and vacant homes. In keeping with the collaborative nature of the project, we focused on the problems that mattered most to residents and were validated with officer experiences and with crime data. Analyzing police calls for service, police incidents, ShotSpotter data, tax assessor data, systematic social observation, public works cleanup data, and neighborhood systematic social observations confirmed a high prevalence of shots fired, burglaries, illegal dumping, and vacancies within CPN.

The emphasis of the analysis was on gun violence, but we also examined burglary patterns. We used police data including calls for service, incidents, and arrests from January 1, 2017 through August 27, 2018, as well as ShotSpotter events from June 26, 2017 (when it was first available in CPN) to September 4, 2018. Other data included public health department recorded dumping cleanup events in 2017, systematic social observations in July 2018, post office addresses of known vacant homes as of fall 2017, and tax assessor data as of July 2018 regarding occupancy (vacant lot, vacant home, renter/owner-occupied). The St. Louis County Police Department provided shapefiles for street segments, community boundaries, and land parcel boundaries in CPN. We conducted a hot spots analyses examining violent crime, shots fired, burglaries, illegal dumping, and vacancies, including the spatial overlap/association of these crimes with potential drivers (e.g., drugs, vacancies, streetlights). We identified geographic concentrations of these offenses, determining that the location of hot spots differed somewhat by crime type. Using County assessment data, we determined that approximately 60% of properties in CPN are not occupied by the owner of the property. About 21% of these properties are owned by individuals who live out of state, albeit many of the out of state owners are banks, trusts,

or other corporate entities. After St. Louis County, Beyond Housing owns the most property in CPN (21 houses and 3 lots).

Gunfire. Shots fired events in CPN occurred predominantly at night (two-thirds occurred between 6pm and 2am but concentrated especially between 8pm-1am). Incidents were spread across days of the week, with slightly higher numbers on weekend nights. Street segments immediately surrounding the elementary school and the church in CPN had the lowest concentrations of shots fired. However, Castlepoint Park experienced 14 ShotSpotter events during the 14 months—clustering in the parking lot, street in front of the park, and near the park restrooms. Only four of the events resulted in police reports, three were tied to one incident of destruction of property and the remaining was a robbery. The presumption was that shots fired at the park were likely to be dispute-related.

Few incidents recorded by ShotSpotter were reported to police (8%). When officers responded to ShotSpotter events, they rarely found evidence such as shell casings, damaged vehicles or homes, or witnesses. Officers perceived that since ShotSpotter events occurred most often at night and because shell casings are likely to land in overgrown grass, it is difficult to find shell casings and unlikely residents will come out of their homes to talk to police in the dark of night. Of 410 ShotSpotter events during the 14-month study period, 33 of those events resulted in 27 reports and arrests were made for 7 incidents (1 homicide, 1 robbery, 5 unlawful possession of firearm). These statistics show a lack of reporting and lack of available evidence when officers investigate a scene.

More than one in five houses in CPN (22%) experienced a gunfire incident within 25 feet of it during the 14-month study period. A small proportion, 1.3% of addresses experienced 3 or more gunfire incidents during this time. Other crime problems tended to co-occur geographically (e.g., drugs, violent crime, property crime), especially in two specific shooting hot spots of CPN. Among residences that experienced a ShotSpotter event within 25 feet of the address, 69% also experienced a call for service for something unrelated.

Shots fired incidents tended to entail shots from vehicles or on the streets (33%), occur at vacant houses or lots (24%), or involve celebratory gunfire (possibly fireworks) (5%)—65 shots fired events occurred between Dec 31 and January 1, 2019. Officers believed that some incidents are motivated by residents test firing newly acquired guns, people using guns when drunk, domestic drama, and fights at school or disagreements that escalate. The analysis showed several repeat address locations that were not vacant homes where gunfire events tended to involve multiple rounds and occurred at night or in the early morning hours, and several of these locations also showed evidence of drug violations. Approximately 9% of gun incidents appeared to also involve drugs. Street segments with drug calls for service did have a moderate correlation with ShotSpotter events (r=.400), but generally this was perceived by police to be most commonly a motivator for incidents near Castlepoint park.

We identified four key drivers of gunfire incidents in CPN. A key facilitator of street-based gunfire was traffic flow on CPN's grid street network with few stop signs or speed humps slowing traffic, and with 10 entrances/exits onto two major roads providing quick and easy ingress and egress. This allowed vehicles to enter and leave the area with little opportunity for guardianship. Notably, the low incidence areas near the school and church are areas where the grid structure of the streets are disrupted by those facilities and use of a one-way street. Darkness also was a factor, with 73% of events occurring in unlit areas. Darkness and vacant properties limit witnesses and guardianship. Observational and assessment data showed that approximately 20 to 22% of homes in CPN were vacant. Twenty percent of vacant homes experienced shots fired incidents versus 16% of rental homes and 11% of owner-occupied homes. Of the homes experiencing multiple shots fired incidents within 25 feet, half were vacant. At vacant homes, events tended to involve a small number of rounds (1 to 3), raising the question of whether these locations may be sites for test-firing guns. Blight from dumping, vacant homes, overgrown vegetation, rental practices that lack accountability and trash pickup, and general disrepair generate fear and withdrawal and reduce informal social control behaviors, providing an

environment conducive to crime, including shots fired. On one small street segment with a concentration of shots fired, St Louis County Department of Public Works had conducted 28 cleanups in one year, removing 1280 cubic feet of trash (e.g., televisions, couches, mattresses, construction/yard debris), including 42 tires in 2018. On another high incident block, Public Works conducted 7 cleanups in one year, removing 675 cubic feet of trash in 2018. The correlation between ShotSpotter events and Public Works cleanup locations was significant and strong (r=.586). We found similar positive associations between illegal dumping incidents on street segments and ShotSpotter events (r=.475), as well as SSO-observed physical disorder and ShotSpotter events (r=.456). These associations support the theory that signs of disorder facilitated a culture of anonymity and withdrawal that limited informal social control and provided opportunities for shots fired.

Recorded gun offenses in CPN, in order of frequency, included aggravated assault, unlawful use of a weapon and other weapon violations, shots fired, destruction of property, drug violations, larceny theft of a firearm, robbery, and homicide. Almost half of these incidents were cleared by arrest (45%). Just over one-third of arrestees (36%) lived in CPN, 55% lived outside of CPN, and the remaining had unknown addresses. Most arrestees were male (91%) and black (100%). Several addresses were repeat locations for gun offenses. Thus, while shots fired were a frequent and overt problem prioritized by the community and officers alike, other gun problems co-occur in CPN.

Burglary. Burglaries were the most serious frequent crime in CPN. Burglary accounts for 31% of all reported Part 1 offenses in CPN, higher than the prevalence in the county overall and in the U.S. (less than 17%). Most street segments in CPN did not experience burglary (71%). Fourteen percent experienced two or more burglaries. Two-thirds of CPN burglaries occurred in occupied homes (63%) and just over one-third (36%) occurred in vacant homes—with the likely target at vacant homes being copper piping. However, 55% of burglary locations were adjacent to vacant property, where guardianship is low. The peak time for burglaries was 10am to 6pm, according to the time of report—

with occupied dwelling burglaries occurring between 10am to 2pm and vacant homes being hit 6am to 6pm. The peak day for burglaries of vacant residences was on Friday, but occupied dwellings occurred across the week. These figures suggest that burglars targeted homes when and where they expected the lowest guardianship. A majority (63%) involved forcible entry to the home. Burglaries where access was not forced were highest over the weekend, when people tend to be at home and may leave doors to the garage or home unlocked. As other researchers found, in CPN, there was a pattern of repeat and near repeat burglary. When a home is burgled, it is likely to be burgled again within a week (the risk increases 1800%) and homes within about a two-block area (800 feet) of that address have elevated risk for 8 to 14 days (the risk increases by 68%). Few burglaries in CPN were cleared by arrest (5.3%). This is low compared to the national rate of 13.1% (FBI, 2018). Of four burglaries cleared by arrest during the study period, two were committed by CPN residents. Reduced natural surveillance due to vacancies and at times when people tend to work away from their homes appear to provide opportunities for many of the CPN burglaries.

Given the nature of the problems in Castlepoint, the residents, core management team, and cross-sector steering committee developed and supported a multi-faceted, targeted, evidence-based plan to address the problems. The intent was to reduce blight, improve collective efficacy, guardianship, and territoriality, and reduce anonymity, while increasing the amount of information and evidence available to police on shots fired, and applying target hardening strategies against shots fired and burglaries. Initially, the proposed plan entailed removing large quantities of brush and debris with a bulldozer and community cleanups, systematically increasing streetlighting, and utilizing cameras and license plate readers to increase guardianship, while also implementing an activity generator—a community garden—to promote legitimate use of space, increase territoriality and guardianship, and to provide additional opportunities for resident interactions through events, and to improve information sharing with police via the Neighbors application and Ring doorbell cameras. The community sought

permission to alter traffic flow by closing streets with jersey barriers and implementing speed humps, but this was not supported by the county. The police department agreed to push out warnings to residents about possible repeat burglary victimization risk and to conduct directed foot patrols in hot spots and to place door hangers at night when ShotSpotter events occur and they were not able to speak to residents of nearby homes in an effort to gather information and evidence. The team also proposed purchasing a metal detector to find shell casings in grassy areas, but that was denied by BJA.

Project Activities Implemented in CPN

The COVID-19 pandemic impacted implementation and discontinued resident meetings and steering committee meetings. However, some strategies moved forward nonetheless. Implementation strategies in CPN from 2018 through 2021 included:

1. Yard signs against illegal dumping
2. Refrigerator magnets with information about access county services and reporting dumping
3. Use of dumpsters and cleanup efforts
4. Directed patrols in hot spots (primarily foot patrol)
5. Installation of murals on vacant homes
6. Bobcat procured and used for trash and brush cleanups
7. Ameren survey of available lighting and plan for improvement
8. Camera monitoring in high vacancy areas in real time from 2pm to 2am
9. License plate reader
10. Hired a local CPN resident to assist with project implementation
11. Community garden
12. Community alliance formed and began 501c3 process
13. Virtual Artworks mentorship program with CPN youth for 3 summers
14. Community message board near Castle Point Park
15. Officer installation of Ring doorbell cameras to 100 CPN residents
16. Planned, but not implemented during the project period: Improved lighting

Figure 3 provides a timeline of program activities

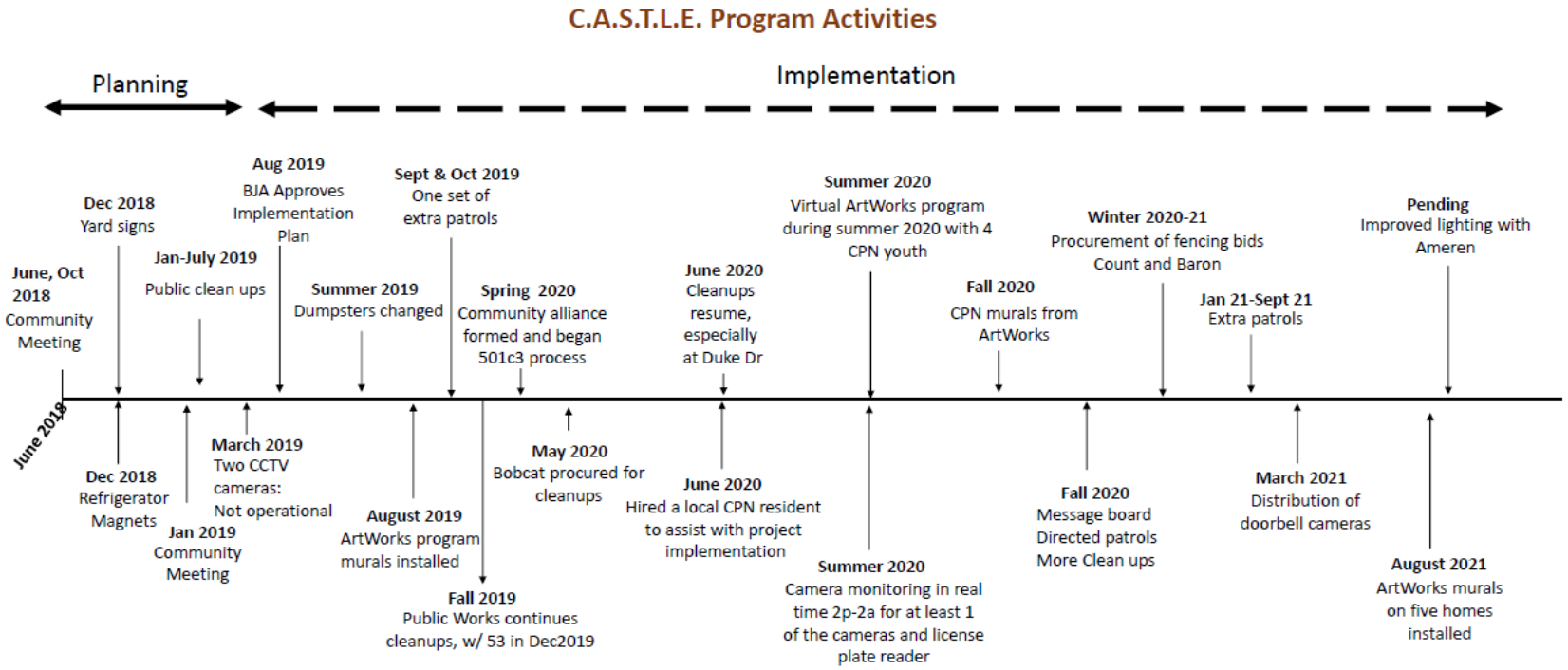


Figure 3. Timeline of Project Activities

Having use of the bobcat allowed the public works department, even with minimum staff, to be able to do cleanups that they would otherwise not be able to do. Furthermore, the bobcat was able to handle large overweight items that were dumped in bulk, such as concrete and large sections of trees that were cut up. They used the brush attachment to clear overgrowth in what they estimated was done in one-tenth of the time it would have taken the team with chain saws and having to remove the debris afterwards. Prior to the bobcat purchase, in the 19 months from November 2018 through May 2020, public works conducted 371 cleanups in CPN, including 15,550 cubic feet of brush and 17,605 cubic feet of rubbish. Comparatively, during the 19 months from June 2020 through December 2021, they conducted fewer cleanups (n=333),

but more brush (22, 945 cubic feet) and more rubbish (27,815 cubic feet). Thus, the average before the bobcat is 42 cubic feet of brush per cleanup and 47.5 cubic feet of rubbish. After the bobcat purchase, the average cleanup included 70 cubic feet of brush, a 67% increase, and 83.5 cubic feet of rubbish, a 76% increase. The differences are statistically significant. The volume is depicted in Figures 4 and 5.

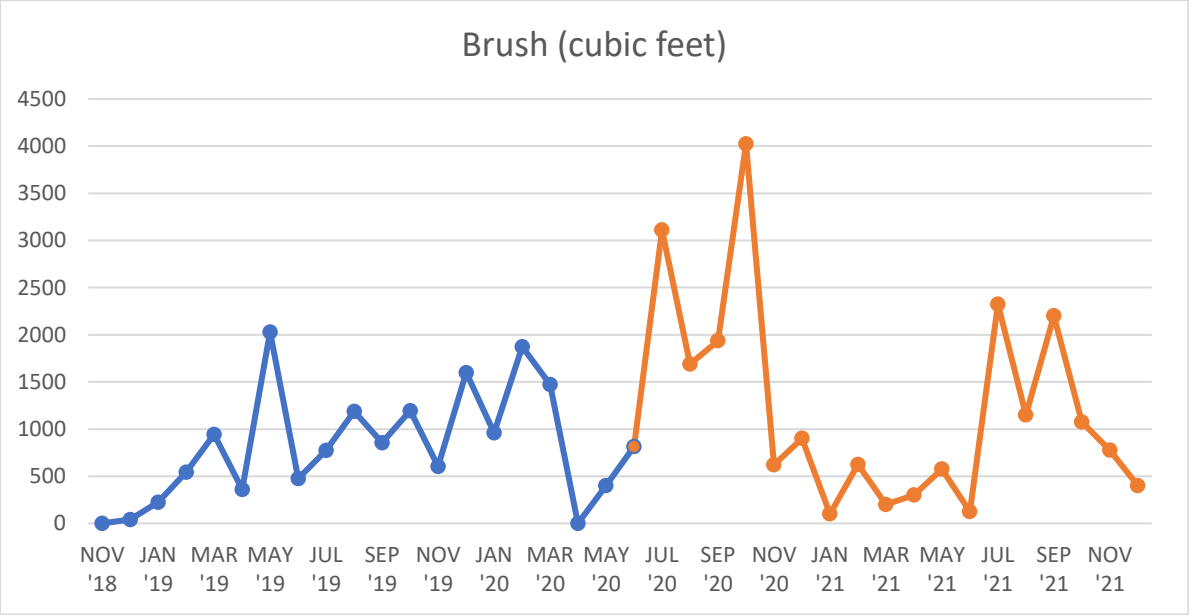


Figure 4. Volume of Brush Collected at CPN Cleanups Comparing Before vs. After Bobcat Use

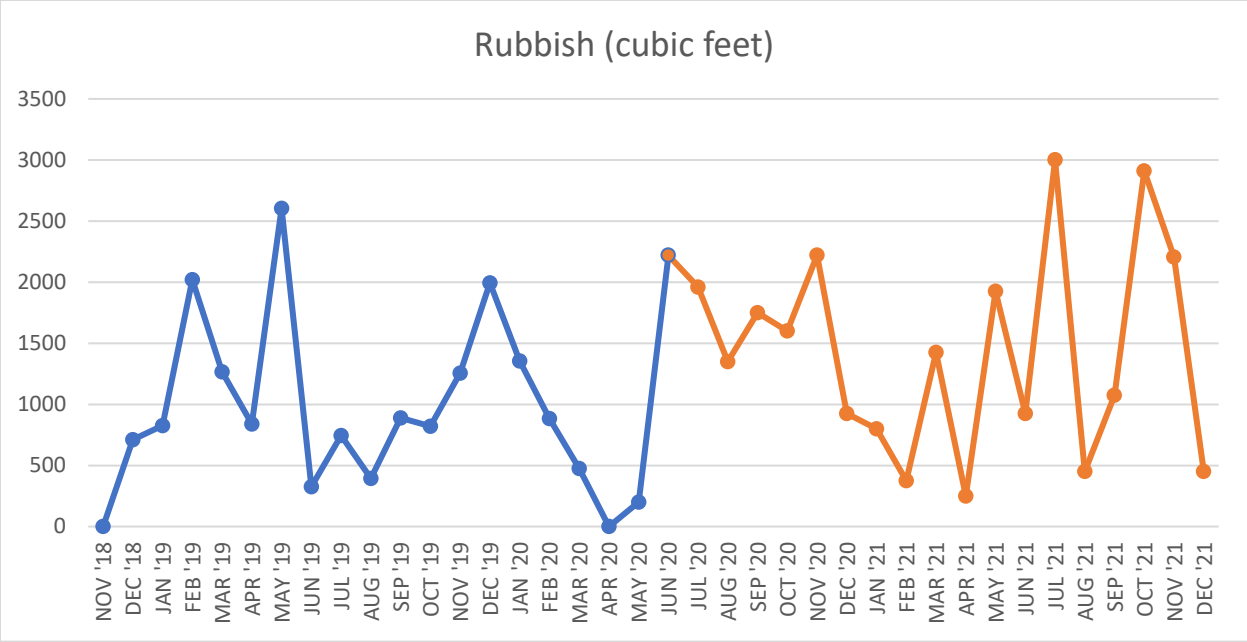


Figure 5. Volume of Rubbish Collected at CPN Cleanups Comparing Before vs. After Bobcat Use

Evaluation Strategy

Quasi-Experimental Approach

The primary evaluation strategy was quasi-experimental. The area of focus in CPN, was determined at the outset and thus was not amenable to an experimental approach, randomly assigning which neighborhood received treatment. However, to maximize our confidence that any changes in CPN were not merely by chance, but rather an outcome of the program activities, we compared the outcomes in CPN to two comparison neighborhoods. This approach allowed us to account for ancillary factors that could affect project outcomes but were unrelated to the intervention activities—events such as the COVID-19 pandemic and George Floyd's killing by police, or even local events such as change in leadership within the police agency or county. Examining changes in CPN relative to similar neighborhoods at the same time helps build confidence that any observed changes within CPN can be credited to project activities rather than events or experiences impacting the jurisdiction more broadly. Therefore, we assessed changes within CPN over time, relative to changes in two similar comparison areas over time. We treated the time prior to August 2019 as the pretreatment period and starting in

August 2019 as the beginning of implementation consistent with the project timeline in figure 3. However, it is notable that several strategies such as hot spots policing, the message board, doorbell cameras, and streetlight improvements were not in place in August 2019—thus, program operations became more complete over time.

Comparison Neighborhoods

St Louis County Police Department Crime Analysts, the Project Coordinator, and the Research Partner assessed data in summer 2018 to finalize two comparison neighborhoods located in North County that were most similar to CPN in size, population, and crime. Table 1 provides comparisons. Like CPN, the comparison neighborhoods are composed of predominantly black residents, and with high rates of violent and property crime. Comparison 2 is most closely aligned with CPN in terms of size and resident demographics, while Comparison 1 had slightly higher white population and was smaller in size than CPN.

Table 1. CPN and Comparison Neighborhoods

		Castlepoint	Comparison 1	Comparison 2
2010 Census	Population	3084	1838	2328
	Households	963	628	809
	Housing Units	1217	753	962
	% White	5.3%	33.1%	9.8%
	% Black	92.7%	62.9%	88.7%
	% Am. Indian	0.0%	0.1%	0.1%
	% Asian	0.3%	0.4%	0.2%
	% Pacific Islander	0.0%	0.1%	0.0%
	% Other	0.1%	0.8%	0.2%
	% Two or More	1.7%	2.6%	1.1%
	% Hispanic	0.6%	1.8%	0.7%
2017 Crime Data	Violent Crimes	39	24	38
	Property Crimes	104	49	102
	Total	143	73	140
	Homicides	1	0	1
	Violent Crimes/10,000 people	126.46	130.58	163.23
	Property Crime/10,000 people	337.22	266.59	438.14
	Total Crime/10,000 people	463.68	397.17	601.37
	Homicide/10,000 people	3.24	0.00	4.30
	Street Segments	97	61	81
	Area (sq. miles)	0.43	0.23	0.5
2018 Crime Data: 1/1/18-6/30/18	Violent Crimes	24	26	14
	Property Crimes	54	32	61
	Total	78	58	75
	Homicides	2	4	0
	Violent Crimes/10,000 people	77.82	141.46	60.14
	Property Crime/10,000 people	175.10	174.10	262.03
	Total Crime/10,000 people	252.92	315.56	322.16
	Homicide/10,000 people	6.49	21.76	-

Experimental Evaluation

A second evaluation strategy applied an experimental design within CPN to examine the influence of the directed patrols, primarily foot patrols, on crime within CPN hot spots. The purpose of this evaluation was to examine whether providing additional police presence for 2-, 4-, or 8-week periods in emergent CPN crime hot spots deterred potential offenders and resulted in fewer shots fired or fewer disorder calls for service. Within a couple weeks of each approaching treatment period, a crime analyst

examined ShotSpotter data and part 1 crimes for the preceding 6-month period and separately examined the most recent 1-month of ShotSpotter events. The goal was to avoid choosing areas of focus that were only high in crime for a very short time (a temporary blip) and to exclude hot areas that had recently turned "cold." The crime analyst identified 4 areas of crime concentration that did not overlap geographically—at least 150 feet apart and which followed property line boundaries. She randomly assigned one of the areas to serve as a control area and the remaining were treatment areas. Thus, across seven treatment periods, there were 21 hot spots and 7 control spots.

A supervisor scheduled at least one, but ideally two officers to conduct extra patrols in the treatment areas as part of the evaluation design (manpower availability for this detail was a challenge). The goal was for each of two officers to provide 10 additional hours of foot patrol (or by vehicle if time of day or weather made that more appropriate) per week across the hot spots for the designated number of weeks (2, 4, or 8). The crime analyst provided officers a web-based map of the treatment hot spots during the active treatment periods. There was a two-week gap between most of the treatment periods.[1] Officers were instructed to conduct approximately 11-15 minutes of extra patrol within a hot spot before moving to another treatment hot spot. The timeframe for the hot spots implementation included one treatment September 8 through November 2, 2019 and then a gap due to staffing and then COVID-19 problems, whereby treatment periods resumed January 7, 2021. The experimental evaluation of the impact on hot spots only utilizes the specific times during which hot spots received directed patrols (see figure 6).

Data Sources

The impact evaluation was multifaceted, examining official measures of crime, observed physical and social disorder, and public perceptions and experiences in CPN. Data for these measures include ShotSpotter alert data (January 2017 through October 2021), police calls for service for January 2016 through October 2021 (e.g., shots fired, illegal dumping, abandoned autos, and other disorder calls), Part 1 incident data (January 2016 through July 2019, a panel household survey (March to May 2019--

[1] Due to changes in supervisor and also due to COVID, the gap between the first treatment period and the second was 13 months. Due to weather conditions and supervisory challenges, there was 6 weeks between period 2 and 3.

baseline; June to Oct 2020; July to September 2021), and annual systematic social observation of street segments (summer 2018--baseline, 2019, 2020, 2021). Time spent in CPN by officers conducting directed patrols was tracked by reporting the extra patrol times to the county CAD, including any specific activities conducted, and via body cameras and vehicle automated vehicle location data.

Official Data Sources

The St. Louis County Police Department (SLCPD) provided official data for the study. The neighborhood-level analysis relied upon disorder calls for service (see table A-1 in appendix A for the type of offenses recorded as disorder) (n=3,295) and shots fired calls for service (3,769) for the three neighborhoods. The unit of analysis for the neighborhood impact is monthly counts between September 1, 2018 and September 30, 2021 for calls for service outcomes. This data included 11 pre-treatment observations and 26 post-treatment observations.

For the hot spot level analyses, we also used ShotSpotter alert data. However, these data were not available for all neighborhoods until July 1, 2019. We used pooled time series analyses count regression to examine the neighborhood impact. For the experimental hot spot analysis within CPN, weekly counts of disorder and shots fired calls for service and ShotSpotter alerts occurring within the designated hot spots during a treatment period (2, 4, or 8-weeks) are the units of analysis. This includes 53 ShotSpotter alerts, 61 shots fired calls for service, and 49 disorder calls for service. The primary analysis applied Poisson regression to examine the effectiveness of the treatment on the outcomes, compared to the controls. A second analysis examined the impact of duration of the treatment on the outcomes.

Systematic Social Observation

To examine the impact on physical disorder and social order, pairs of observers systematically recorded evidence of physical/social order and disorder in CPN and two comparison neighborhoods on weekends at baseline in summer 2018 (July) and then each subsequent summer, 2019 (May-July), 2020 (June-July), and 2021 (June-July). See tables A-2 through A-5 in appendix A for the specific indicators[2]

[2] Coding reliability is good. Coding reliability assessments of the SSO data were compared based on the number of structures per street segment. This should be a relatively stable measure over time, albeit with a high proportion

Utilizing the same protocol each year, they systematically recorded street characteristics: presence and condition of a community park; vehicle, pedestrian, and bicycle traffic; the condition of the roadway, streetlights, and sidewalks; presence and amount of specific forms of physical disorder (e.g., trash, brush, construction debris, unwanted items, fire damage, dilapidated fences, inoperable cards, graffiti), physical order (e.g., secure gates, landscaping) and social disorder (e.g., arguing, vagrancy, drug use, loitering) and order (e.g., mowing, chatting socially, supervising children at play, completing outdoor chores). This is a point-in-time estimate. It is not dynamic, but rather a snapshot of what coders observed in the neighborhood on the day/days that they coded prior to implementation activities versus after implementation activities. We examined four observed outcomes: 1) the amount of physical disorder on a street segment, the proportion of residential structures with physical disorder, 3) the proportion of residential structures with physical order, and 4) social order activities. Appendix A provides the details for each of these measures. We utilized two analysis strategies to examine impact. First, the ANOVA model shows whether the areas differ from each other across time regarding each of these measures. Second, we used before/after t-tests to compare the scores from the baseline year (2018) to 2021.

Household Survey

Household surveys were conducted in each of the three neighborhoods prior to project implementation in 2019, and again in 2020 and 2021. A random sample of households was selected at baseline and efforts were made to conduct a panel survey—obtaining surveys from the same household over time. However, at each subsequent wave, a supplemental sample was also randomly sampled in order to deal with potential attrition. The response rate was about 30%, with cooperation rates (completed surveys out of those households with which we successfully made contact) ranging from 45 to 64 percent. In 2020, the COVID pandemic led to challenges, prohibiting in-person efforts during most of the survey period, with only CPN receiving in-person survey efforts for a 2-week period. Thus, response rates are

of vacancies in the neighborhood and demolitions. Thus, we assessed the number of structures recorded by coders in 2018 to 2020 by street segment, allowing for differences up to 2. The percentage agreement is 90%. Potential discrepancies in this measure are likely- due to challenges of determining on which segment to count corner homes—many of the street segments are short and sometimes the front of the house can be difficult to ascertain.

lower in 2020, and much lower in the comparison areas. Cooperation rates could not reliably be computed in 2020 due to shifting delivery modes (telephone, mail, and in-person in CPN only). Thus, wave 2 results are interpreted with caution. Full details are provided in Table 2.

Utilizing the results from the household survey, we examined 19 outcomes associated with neighborhood wellbeing and views about police. We examined residents' pride living in the neighborhood; assessments about social cohesion in the area; informal social control; feelings of safety; perceptions that police are actively working to address crime and safety problems; frequency residents see police in their area; frequency residents see drug sales and hear gunshots; perceptions that police respond quickly; perceptions of police legitimacy, fairness, injustice; and effectiveness; how good of a job police are doing with illegal dumping and shots fired incidents; satisfaction with police services, with treatment by police during encounters, and with the frequency residents see police; and residents' willingness to cooperate with police. For eight of the outcomes, we used responses to multiple questions to formulate a factor score. Table A-6 in appendix A provides the specific questions that represent each of those eight outcomes. To assess the impact on the outcomes, we conducted a series of mixed effect regressions. In these analyses, we accounted for resident race (black/nonblack), gender, age, and homeownership status, as these factors can influence residents' views about the outcomes we examined apart from the programmatic activities. This process can inform whether changes in CPN residents' perceptions across time are significantly different from changes experienced by comparison area residents for those same time frames.

Table 2. Household Survey Response and Cooperation Rates by Area and Year

	CPN			Comparison 1			Comparison 2		
	wave1 2019	wave2* 2020	wave3 2021	wave1 2019	wave2* 2020	wave3 2021	wave1 2019	wave2* 2020	wave3 2021
Households		956			635			887	
Sampled addresses	390	300	390	250	225	250	370	275	370
Vacant addresses	69	34	68	24	1	39	41	0	45
Invalid addresses	1	0	3	0	0	1	5	0	2
Valid sample	320	266	319	226	224	210	324	275	323
Addresses made contact in person/ phone	200	103	221	113	28	159	143	26	206
Completed	128	74	99	67	25	74	82	25	101
Response Rate	40%	28%	31%	30%	11%	35%	25%	9%	31%
Cooperation Rate	64%	n/a	45%	59%	n/a	47%	57%	n/a	49%

**Due to COVID, wave 2 surveys in 2020 were attempted by phone first, 2-weeks in-person (wearing facemasks) in CPN only, then by mail. It is difficult to know whether addresses have become vacant in Comparison 1 and 2 at wave 2 unless the return mail specified a vacancy.*

Project Impact

Impact on Residents' Perceptions and Experiences in their Neighborhoods

Table 3 synthesizes the mixed effect regression results across the 19 outcomes, noting whether CPN or the comparison areas experience more favorable change between 2019 and 2020 and between 2019 and 2021. Across most outcomes, CPN residents show a trend of significant decline during 2020 (likely a factor of COVID since few project activities occurred in 2020, but also we must cautiously interpret these results due to low response in 2020), with significant improvement into 2021. However, the comparison areas mostly experienced nonsignificant declines in 2020 and a few significant improvements from 2020 to 2021. In most cases, even significant changes in predicted margins were substantively small, reflecting about a one percent change. Notably, informal social control declined significantly in CPN and comparison areas in 2020 (17% and 5% respectively—among the largest changes recorded in residents' assessments) and then improved through 2021. The only other somewhat meaningful changes in views occurred in CPN and were reflected as declines in 2020 in police legitimacy (by 7.5%), police effectiveness (by 7%), and social cohesion (by 6%). Low response rates in 2020 make interpretation of these findings a bit uncertain. Thus, overall, we found few changes in residents' views in CPN vs the comparison areas. As would be expected given the directed patrols, residents in CPN reported seeing police significantly more over time relative to comparison residents. Comparison area residents reported more favorable change between the start and end of the project on perceptions of police—police legitimacy, procedural justice, police injustice, and police address illegal dumping. Comparison residents also reported significantly more favorable results for informal social control relative to CPN residents between 2019 and 2021.

Table 3: Relative Impact: Change Favoring CPN or Comparison or No Significant Difference (--)

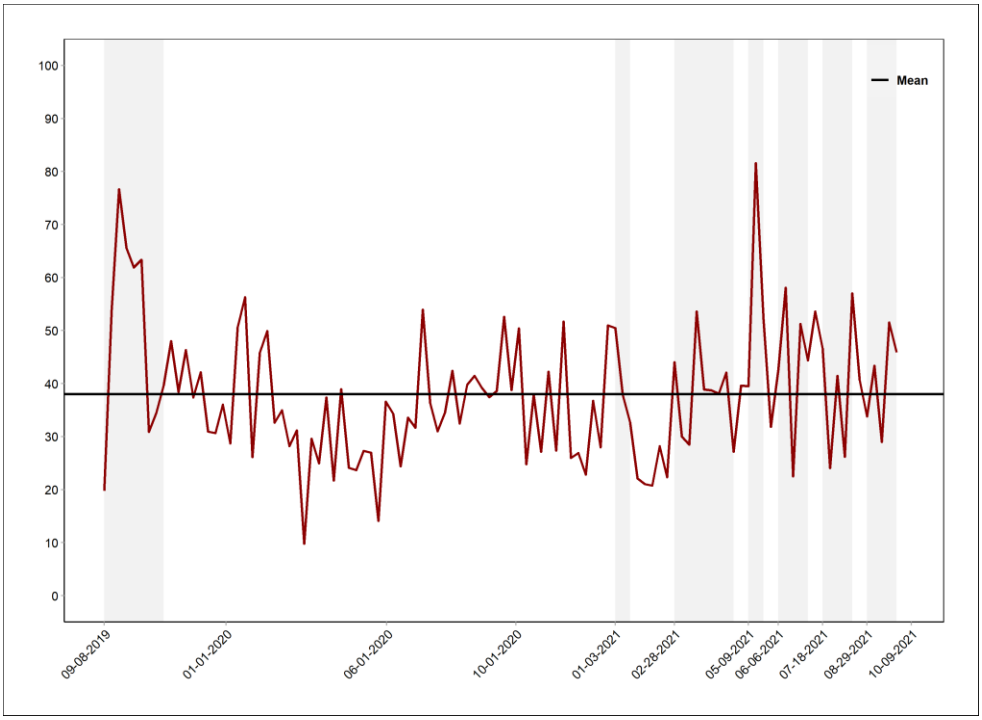
Outcome	Change 2019 to 2020*	Change 2019 to 2021
Pride in Neighborhood	--	--
Social cohesion	--	--
Informal social control	--	Comparison
Safety	CPN	--
Police actively working to address problems	--	--
Residents see police more frequently	CPN	CPN
Frequency see drug sales	--	--
Frequency hear gun shots	--	--
Police respond quickly	--	--
Police legitimacy	--	Comparison
Procedural Justice	--	Comparison
Police injustice	--	Comparison
Police effectiveness	--	--
Police addressing dumping	Comparison	Comparison
Police addressing shots fired	--	--
Satisfaction w/services	--	--
Satisfaction w/ treatment during encounters	--	--
Satisfaction w/frequency see police	--	--
Cooperation with police	--	Comparison

**Interpret these results with caution due to low response in 2020 due to COVID-19.*

Impact of Directed Patrol in Hot Spots

Consistent with residents' impressions, computer-aided dispatch (CAD) data suggests that officers spent an average of 35.24 hours per week in CPN during identified treatment periods and an average 29 hours per week outside of treatment periods, a significant increase ($t=2.107$, $p=.037$), albeit not as large as intended. Comparing the nature of activities officers undertook during treatment versus nontreatment time periods in CPN, particularly focused on discretionary activities (not driven by calls for service), shows that officers spent more time on activities meant to address police-community relationships (9.3% of time spent during treatment versus 6.1% during nontreatment periods) and

conducting park patrols (5.7% treatment versus 3% nontreatment), foot patrols (.6% treatment versus .2% during nontreatment), and other extra patrols (3% treatment time versus 1.5% during nontreatment). This leads us to conclude that there was treatment fidelity in the sense that additional time was proactively being spent during treatment periods, however, it was at lower levels than expected.



**NOTE: Grey bars represent treatment periods.*

Figure 6: Total Hours Spent in Castle Point by Week (CAD Entries).

Table A-7 in appendix A provides descriptive statistics relevant to the directed patrol analysis. The first analysis compared the hot spots receiving directed patrol to the control hot spots which received standard policing (officers were not aware of these hot spots) on the three outcomes, while accounting for the different hot spot assignment groups (1-5). The results are in table 4. The only statistically significant impact was on disorder calls for service. CPN hot spots receiving directed patrols had significantly fewer disorder calls than the control hot spots during the treatment periods. The incident rate (IRR) for disorder calls was about half for treatment hot spots compared to the control hot spot.

Table 4. Poisson Regression Results Examining the Overall Effectiveness of Treatment

	ShotSpotter Alerts (1)			Shots Fired CFS (2)			Disorder CFS (3)[3]		
	Coef.	*SE*	IRR	Coef.	*SE*	IRR	Coef.	*SE*	*IRR*
Treatment hot spot	0.130	0.328	1.139	-0.305	0.276	0.737	-0.642*	0.293	0.526
HS Group 1	-0.118	0.403	0.889	-0.065	0.362	0.937	0.619	0.353	1.857
HS Group 2 (3)	-1.099	0.609	0.333	-1.674*	0.729	0.187	-1.946	1.024	0.143
HS Group 3 (4)	0.368	0.338	1.444	0.118	0.339	1.125	0.357	0.384	1.429
HS Group 4 (5)			-			-			
HS Group 5 (6)	-1.504*	0.733	0.222	-0.758	0.481	0.469	-0.560	0.546	0.571
Constant	0.712*	0.319	2.038	1.201***	0.260	3.322	0.999***	0.283	2.714
Pseudo R^2		0.125			0.120			0.194	
N		28			28			28	

Notes. * p<.05, ** p<.01, *** p<.001

We also tested to see if the duration of the directed patrols produced different outcomes within hot spots relative to control hot spots. Although only finding one general effect—on disorder, we still compared a four-week duration to two- and eight-weeks. Table 5 suggests that the duration of the treatment did not have a significant effect on the outcomes. This analysis deals with low counts and so may have little power to detect an effect.[4] Thus, future studies should investigate the importance of duration.

Table 5. Poisson Regression Results for the Effectiveness of Differing Treatment Durations (n=28 weeks)

	ShotSpotter Alerts (1)			Shots Fired CFS (2)			Disorder CFS (3)		
	Coef.	*SE*	IRR	Coef.	*SE*	IRR	Coef.	*SE*	*IRR*
Treatment hot spot	0.348	0.690	1.417	-0.470	0.438	0.625	-0.560	0.476	0.571
Two Week period	0.118	0.947	1.125	-0.065	0.570	0.937	-0.847	0.802	0.429
Eight Week period	0.629	0.874	1.875	0.118	0.540	1.125	0.762	0.493	2.143
Two Week * Tx	-0.466	1.089	0.627	0.160	0.695	1.173	0.377	0.962	1.458
Eight Week * Tx	-0.284	0.995	0.753	0.352	0.649	1.422	-0.277	0.635	0.758
Constant	0.288	0.613	1.333	0.981**	0.354	2.667	0.847*	0.378	2.333
Pseudo R^2		0.021			0.028			0.144	
N		28			28			28	

[3] Pre-treatment equivalency tests suggest that hot spots in group 4 were not equivalent for disorder-related CFS 6-months prior to treatment. We ran a sensitivity analysis, including and excluding group 4 from the analysis. We had the same substantive results. Thus, this analysis reports the results without excluding group 4.

[4] Had there been statistical significance, we would interpret the incidence rate ratios (IRR). For example, we would have claimed that for disorder, two week treatment hot spots had 1.5 times the amount of disorder calls for service than 4 week treatment hot spots.

Impact in CPN Relative to Two Comparison Areas

Table 6 provides descriptive statistics by neighborhood for September 1, 2018 through September 30, 2021 for shots fired and disorder calls for service. Tables 6 and 7 show the analyses of impact. The analysis in Table 6 compares the actual counts of shots fired and disorder calls to what would be expected to happen (predicted) based on the baseline counts of each outcome if no change occurred.[5] The results show that the actual calls were not significantly different than predicted in CPN or comparison 2. In comparison 1, shots fired calls for service were significantly higher than was predicted. Using a corrected Z test allows us to examine whether the effect within CPN differed significantly than the effect within comparison 1 for shots fired calls. It does. The difference in comparison 1 between the actual calls for shots fired relative to what would have been expected, given the baseline, is significantly higher than what was observed in CPN.[6]

[5] This is a negative binomial regression interrupted time series analysis. It is used when Poisson regression is not appropriate due to overdispersion, which was the case for both shots fired and disorder calls for service per the Likelihood ratio test which showed that the alpha is significantly different from zero.

[6] Corrected *Z* comparing CPN to comparison 1 is -3.82, *p*=.0001. The Z is computed by taking the difference between the coefficients and dividing that difference by the square root of the sum of the standard errors squared.

Table 6. Descriptive Statistics for Each Study Neighborhood (Monthly Counts)

	CPN				Comparison 1				Comparison 2			
	Pre Sept 2018-July 2019		Pre Sept 2018-July 2019		Pre Sept 2018-July 2019		Pre Sept 2018-July 2019		Pre Sept 2018-July 2019		Post Aug 2019-Sept 2021	
Dependent Variables	Mean (std)	Mean (std)	Mean (std)	Mean (std)	Mean (std)	Range	Mean (std)	Range	Mean (std)	Range	Mean (std)	Range
Shots Fired CFS	30.5 (11.6)	7.6 (4.1)	7.6 (4.1)	7.6 (4.1)	7.6 (4.1)	4-17	23.3 (9.8)	9-44	28.7 (9.9)	17-47	38.7 (13.3)	19-70
Disorder CFS	38.0 (13.1)	21.9 (9.0)	21.9 (9.0)	21.9 (9.0)	21.9 (9.0)	9-38	20.4 (8.0)	7-41	31.2 (18.9)	21-50	27.1 (10.7)	12-60

Table 7. Negative Binomial Regression Interrupted Time Series Results

		CPN			Comparison 1			Comparison 2		
Outcome	Predictors	Coef.	*SE*	IRR	Coef.	*SE*	IRR	Coef.	*SE*	IRR
Shots Fired CFS	Treatment Period	0.276	(0.155)	1.317	1.397***	(0.249)	4.043	-0.317	(0.195)	0.729
(*N* = 37 months)	Linear Time	0.017**	(0.007)	1.017	-0.018	(0.011)	0.983	0.024*	(0.010)	1.024
	Temperature	-0.002	(0.003)	0.998	0.006	(0.004)	1.005	-0.002	(0.003)	0.998
	Constant	3.424***	(0.156)	30.701	1.805***	(0.261)	6.082	3.392***	(0.198)	29.712
	AIC/BIC	7.978, -81.064 [a]			7.896, -82.197 [a]			7.896, -82.197 [a]		
Disorder CFS	Treatment Period	-0.097	(0.113)	0.907	-0.298	(0.190)	0.742	0.070	(0.145)	1.072
(*N* = 37 months)	Linear Time	0.006	(0.005)	1.006	0.009	(0.008)	1.009	-0.016*	(0.007)	.985
	Temperature	0.012***	(0.002)	1.012	0.011***	(0.003)	1.011	0.013***	(0.002)	1.014
	Constant	2.921***	(0.123)	18.564	2.411***	(0.198)	11.145	2.740***	(0.155)	15.488
	AIC/BIC	7.124, -80.735			6.775, -82.141			6.853, -83.728		

Notes: * p<.05, ** p<.01, *** p<.001. [a] Correlograms showed some evidence of temporal autocorrelation (e.g., $r < \pm 0.4$)

The analysis in table 8 directly compares the calls for service in CPN (relative to baseline) to the calls for service in each comparison area relative to their baseline, prior to project implementation. The findings suggest that during the implementation period, the shots fired calls in Comparison 1 increased significantly more than in CPN. The increase in shots fired calls is 1.7 times greater than in CPN during the intervention period. However, there was no difference in the changes in disorder calls for service in CPN relative to either comparison area.

Table 8. Negative Binomial Regression Models

	Shots Fired CFS (n=111)			Disorder CFS (n=111)		
	Coef.	*SE*	IRR	Coef.	*SE*	IRR
Post Intervention	0.582***	(0.119)	1.790	0.068	(0.116)	1.071
Comparison 1	-1.387***	(0.172)	0.250	-0.551***	(0.144)	0.577
Comparison 2	-0.016	(0.145)	0.940	-0.198	(0.140)	0.821
C1*Post Intervention	0.532**	(0.196)	1.702	-0.139	(0.210)	0.870
C2*Post Intervention	-0.285	(0.170)	0.752	-0.210	(0.167)	0.812
Constant	3.419***	(0.102)	30.545	3.638***	(0.097)	38.00
AIC/BIC	7.468, -408.358			7.432, -381.0293		

The neighborhood analysis suggests that while CPN did not significantly improve during the implementation period on these outcomes, it also did not significantly worsen. However, comparison area two showed unfavorable trends in that shots fired calls increased significantly more than expected and the increase in shots fired calls experienced during the implementation period in comparison area two was significantly greater than in CPN.

We also examined the impact on observed physical and social disorder and order in CPN relative to the comparison areas by documenting these things through annual systematic social observation (See the appendix A for the specific indicators used). Because the early action project focused on physical disorder, 2018 is designated as the baseline against which we assessed change. That is prior to implementation of early action project cleanup efforts.

Table A-8 in appendix A shows that the trends for the outcomes we documented (amount of physical disorder, proportion of residences on a street segment with physical disorder, proportion with

evidence of physical orderliness, and amount of social order on a street segment) significantly differed by neighborhood. Table 9 and Figure 7 present the variation in these outcomes by neighborhoods from 2018 to 2021. The table shows the average value for the street segments within each neighborhood and then also tests whether this average changed significantly from year to year within the neighborhood and compared the outcome in 2018 to 2021 to assess overall differences.

We found that observed physical disorder in CPN (e.g., trash, discarded household items, yard debris) declined significantly over time. Likewise, in CPN, the proportion of homes on street segments that showed evidence of physical disorder (e.g., graffiti, broken windows, overgrown landscaping, missing siding) was significantly lower in 2021 than in 2018. However, we did not find that the number of homes that showed clear signs of physical order (e.g., tidy landscaping, well secured and undamaged fences and gates) was significantly greater in 2021. Evidence of social order (e.g., individuals performing household chores such as mowing or landscaping, youth/adults socializing together or playing sports) was significantly lower in 2021 than in 2018 in CPN, albeit that was true in all three areas, suggesting that the effects of COVID may be largely to blame rather than project activities.

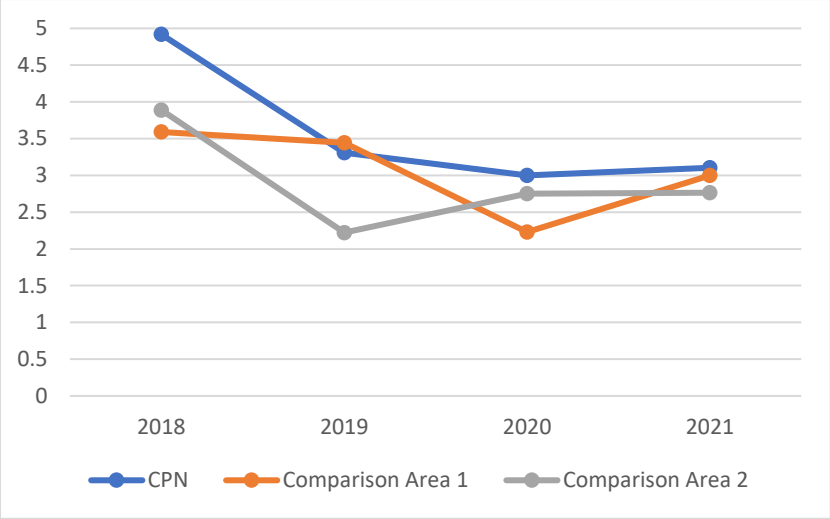
One of the two comparison areas showed significantly less physical disorder in 2021 than in 2018 and significantly lower values for social order in 2021 than in 2018. In general, changes that occurred in CPN lend support to the efficacy of action projects which have been carried out since December 2018.

Table 9. Differences Across Areas from 2018 to 2021

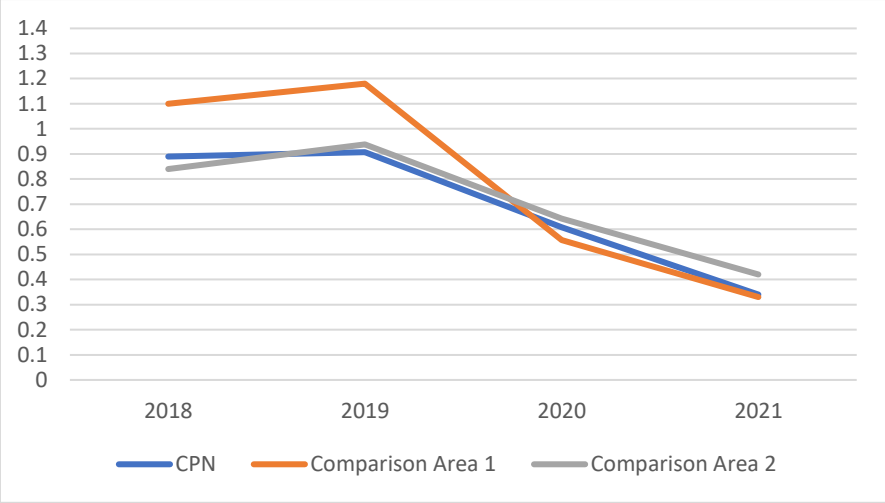
	Castle Point Neighborhood				Comparison Area 1				Comparison Area 2			
	Percent change			Overall 2018 v.	Percent change			Overall 2018 v.	Percent change			Overall 2018 v.
	2018-19	2019-20	2020-21	2021	2018-19	2019-20	2020-21	2021	2018-19	2019-20	2020-21	2021
Amt. Physical Disorder	-33%	-9%	3%	-37%	-4%	-35%	35%	-16%	-43%	2.75	0%	-29%
Physical Disorder Proportion	-19%	19%	-33%	-36%	-5%	115%	-44%	15%	65%	0.076	11%	82%
Physical Order Proportion	-15%	23%	8%	13%	-33%	18%	-42%	-54%	-27%	0.262	-5%	-29%
Amount Social Order	2%	-33%	-44%	-62%	7%	-53%	-39%	-69%	12%	0.642	-35%	-50%
	T test				**T test**				**T test**			
	2018-19	2019-20	2020-21	2018 v. 2021	2018-19	2019-20	2020-2021	2018 v. 2021	2018-19	2019-20	2020-2021	2018 v. 2021
Amt. Physical Disorder	4.25***	0.928	0.2835	4.879***	0.378	3.07**	-2.06*	1.30	3.85***	-1.31	-0.030	2.65**
Physical Disorder Proportion	1.79	-2.12*	4.39***	3.80***	0.38	-1.69	1.33	-1.04	-4.12***	0.03	-1.08	-6.14***
Physical Order Proportion	1.88	-2.42*	-0.92	-1.13	5.60***	-1.61	3.90***	8.12***	5.16***	-0.17	0.28	5.72***
Amount Social Order	-0.172	2.85**	3.113**	4.97***	-0.375	2.96**	2.03*	5.884***	-0.626	2.15*	1.771	3.726**
	Mean at				**Mean at**				**Mean at**			
	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021
Amount Physical Disorder	4.92	3.31	3.00	3.10	3.59	3.44	2.23	3.00	3.89	2.22	2.75	2.77
Physical Disorder Proportion	0.10	0.08	0.09	0.06	0.06	0.05	0.11	0.06	0.05	0.08	0.08	0.08
Physical Order Proportion	0.26	0.22	0.27	0.29	0.39	0.26	0.31	0.18	0.35	0.25	0.26	0.25
Amount Social Order	0.89	0.91	0.61	0.34	1.10	1.18	0.56	0.33	0.84	0.94	0.64	0.42

*Note: *p<.05, **p<.01, **p<.001*

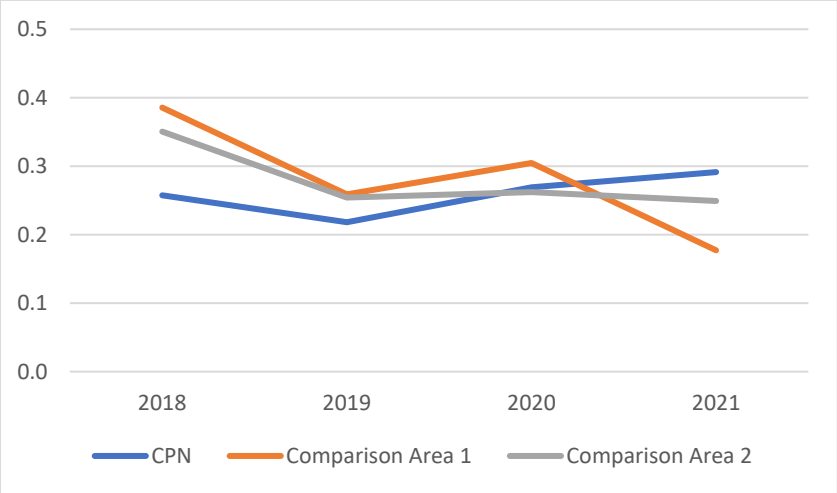
Amount Physical Disorder per Street Segments



Amount Social Order per Street Segments



Residences with Physical Order (Proportion)



Residences with Physical Disorder (Proportion)

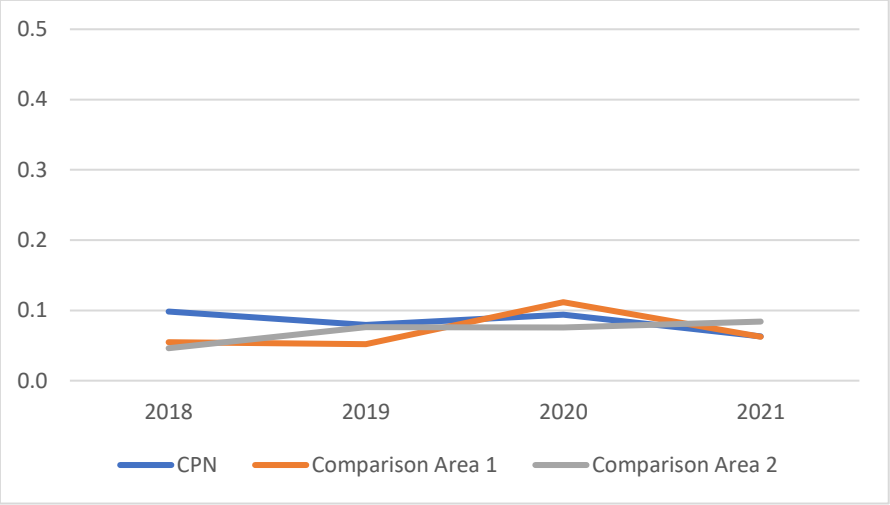


Figure 7. The Changes over Time

Conclusion

The CBCR grant provided a unique opportunity for the CPN community to organize around their crime and safety concerns and to partner closely with the SLCPD and Department of Public Works. It also provided an opportunity to drastically improve efforts to address physical disorder. Nonetheless, numerous approaches designed to promote neighborhood collective efficacy and some other implementation strategies could not be implemented due to the COVID-19 pandemic. The pandemic also hindered community survey data collection efforts in 2020. In spite of these challenges, the project led to reductions in CPN in physical disorder by 2021 compared to baseline and relative to two comparison areas. Furthermore, disorder calls for service experienced significantly fewer disorder calls for service during the hot spots periods than control hot spots that received no change in policing services. Initially, CPN residents did report improvements in feelings of safety from 2019 to 2020, however, the 2020 response rates raise doubt as to the validity of those results. Generally, the C.A.S.T.L.E. effort cannot claim overall improvements in feelings of safety nor in experiences with shots fired.

Appendix A

Table A-1. Count of Disorder-Related CFS by Type in 3 Study Neighborhoods

Call Description	N
Disturbance	930
Destruction of Property	442
Abandon Auto	303
Loud Music	231
Trespassing in Progress	210
Animal Running Loose	179
Fireworks Violation	172
Peace Disturbance	135
Ordinance Violation	114
Drug Violation	105
Illegally parked	99
Fight in Progress	93
Barking Dog	46
Trespassing	43
Destruction of Property Just Occurred	42
Drug Violation in Progress	39
Illegal Dumping	30
Destruction of Property in Progress	28
Illegal Dumping in Progress	17
Intoxicated Person	16
Illegal Dumping Just Occurred	8
Indecent Act in Progress	5
Gambling in Progress	3
Solicitors	3
Indecent Act	1
Loitering	1
Total	3,295

Table A-2. Physical Disorder Measures Coder Rating

Items	Coding
1. Rate the occurrence of litter/trash/broken glass/butts/bottles/cans on the street segment	0 = None 1 = Minimal Amount 2 = Small Amount 3 = Moderate Amt 4 = Large Amount
2. Rate the occurrence of needles/drug paraphernalia	
3. Rate the occurrence of discarded household items (e.g. couch, TV)	
4. Rate the occurrence of brush/yard/construction debris	

Table A-3. Proportion of Residential Structures with Signs of Physical Disorder

Items	Coding
1. Inappropriately placed household items (e.g. dryer, couch, TV on porch, yard, driveway; out of season decorations such as Christmas lights in August)	Integer: # of residential structures on the segment that contain the item.
2. Seemingly occupied dwelling, but with boarded or broken windows/doors	
3. Graffiti (do not count the house number written in large black letters if present)	
4. Missing siding, bricks, shingles, peeling paint, moldy/grimy siding, falling down gutter, or similar	
5. Overgrown/extremely untidy landscaping (e.g., bushes, trees, grass)- in other words, more than a few days of rain are to blame	
6. Fire damage	
7. Unsecure (e.g., access available through open window/door) vacant house in livable habitable condition	
8. Abandoned/dilapidated houses (not habitable)	
9. Dilapidated/falling down gate/fences on property	

Table A-4. Proportion of Residential Structures with Signs of Physical Order

Items	Coding
1. Secure (no clear entry point available without a key) but vacant (clearly unoccupied) home	Integer: # of residential structures on the segment that contain the item.
2. Gate/fences on property that are sufficiently maintained to restrict access as intended	
3. Especially well-designed and tidy landscaping (e.g., mulched or rock beds or flowers)	

Table A-5. Items Showing Scales of Social Order

Items	Coding
1. Youth (9-17) walking/biking/playing sports/other exercise	1 = Yes, 0 = No
2. Adults walking/biking/playing sports/other exercise	
3. Youth (9-17) mowing/landscaping or other household chore/improvement task	
4. Adults mowing/landscaping or other household chore/improvement task	
5. Youth (9-17) present, not causing problems or doing any aforementioned positive activity (e.g., actions like talking on phone, people-watching from porch)	
6. Adults present, not causing problems or doing any aforementioned positive activity (e.g., actions like talking on phone, people-watching from porch)	
7. Adults in vicinity and actively watching children	
8. Adults engaged with children	

Table A-6. Factor Indicators

Variable	Indicator Wording	Factor Loadings	Reliability
Safety			0.725
	How safe do you feel walking in the neighborhood during the day?	0.853	
	How safe do you feel walking in the neighborhood after dark?	0.825	
	How safe do you feel inside your home after dark?	0.618	
	How safe are school-age children when playing outside in the evening?	0.635	
Social cohesion			0.837
	This neighborhood has effective leaders	0.732	
	People in this neighborhood are willing to help each other	0.848	
	The people in this area are a close-knit neighborhood	0.889	
	People in this neighborhood share the same values	0.749	
	People in this neighborhood get together or interact with one another	0.705	
Informal social control			0.862
	If a group of neighborhood children appeared to be skipping school and hanging out on a street corner?	0.733	
	If youth were caught spray painting graffiti or vandalizing a neighborhood building or house?	0.777	
	If people were dumping garbage or debris in your neighborhood?	0.798	
	If someone were publicly selling drugs in your neighborhood?	0.817	
	If residents see suspicious activity or a crime in the neighborhood, how likely would they be to call the police?	0.822	
	If there is a common safety concern among residents, how likely would residents be to work together to do something about it?	0.785	
Police legitimacy			0.71
	You should do what police tell you to, even if you disagree	0.723	
	I feel a moral duty to obey the police	0.872	
	I feel that I should accept decisions made by police officers, even if I do not understand the reasons for their decisions	0.705	
Cooperation with police			0.826
	How likely would you be to report a crime/ suspicious activity in the neighborhood to police?	0.832	
	When you have information that may help solve a crime in the neighborhood, how likely are you to give	0.876	

police the information?		
How likely would you be to willingly assist police if they asked?	0.913	
Procedural justice		0.903
How often do you think police officers stop people on neighborhood streets without good reason?	0.696	
How often do police officers use insulting language when talking to people in the neighborhood?	0.918	
How often do police officers use more force than necessary under the circumstances against people in the neighborhood?	0.914	
Police effectiveness		0.849
Police are actively working to address the crime and safety problems in this neighborhood	0.855	
Police respond quickly to the neighborhood, when they are called	0.818	
The way police use technology in my neighborhood helps to improve my safety	0.841	
Police are capable of controlling crime and maintaining order in the neighborhood	0.742	
Procedural injustice		0.849
Police treat people in the neighborhood with respect	0.891	
Police can be trusted to make decisions that are right for the people in this neighborhood	0.870	
Police treat people in the neighborhood fairly	0.907	
Police officers explain their actions to the people in the neighborhood	0.831	
Police officers listen to people in the neighborhood before making decisions	0.801	
Police care about the problems in this neighborhood.	0.854	

Table A-7. Descriptive Statistics for Directed Patrol Evaluation

Variables	Mean	SD	Min	Max
Dependent Variables				
Weekly ShotSpotter Alerts during treatment periods	1.89	1.83	0	6
Weekly Shots Fired CFS during treatment periods	2.18	1.76	0	5
Weekly Disorder CFS during treatment periods	1.75	1.65	0	7
Independent Variables				
Treatment Dummy (vs control)	0.75	0.44	0	1
Two-Week Dummy	0.29	0.46	0	1
Four-Week Dummy	0.43	0.50	0	1
Eight-Week Dummy	0.29	0.46	0	1
Control Variables				
Hot Spot Group 1	0.14	0.36	0	1
Hot Spot Group 2 (3)	0.14	0.36	0	1
Hot Spot Group 3 (4)	0.14	0.36	0	1
Hot Spot Group 4 (5)	0.43	0.50	0	1
Hot Spot Group 5 (6)	0.14	0.36	0	1

Table A-8. ANOVA Analysis Presenting Overall Changes Across Neighborhoods: From 2018 to 2021

	Sum of Squares	df	Mean Square	F
Amount Physical Disorder				
Time	290.811	3	96.937	14.954***
Neighborhood	88.454	2	44.227	6.823***
Time ✻ Neighborhood	89.392	6	14.899	2.298*
Residuals	6119.226	944	6.482	
Physical Disorder Proportion				
Time	0.090	3	0.030	4.311**
Neighborhood	0.031	2	0.015	2.228
Time ✻ Neighborhood	0.158	6	0.026	3.809***
Residuals	5.185	748	0.07	
Physical Order Proportion				
Time	0.994	3	0.331	9.666***
Neighborhood	0.078	2	0.039	1.133
Time ✻ Neighborhood	0.95	6	0.158	4.619***
Residuals	25.645	748	0.034	
Social Order Coder Rating				
Time	68.074	3	22.691	23.237***
Neighborhood	1.835	2	0.918	0.94
Time ✻ Neighborhood	4.463	6	0.744	0.762
Residuals	921.819	944	0.977	
	Sum of Squares	df	Mean Square	F
	4.463	6	0.744	0.762
	921.819	944	0.977	

*NOTES: *p ≤ 0.05, **p≤ 0.01, ***p ≤ 0.001.*Appendix B: Summary of Early Action Project Impact

Appendix B: Early Action Project Summary

Early Action Project Impact

Police data in CPN from January 2016 through July 2019 showed a downward trend in calls for service per month for illegal dumping and abandoned autos (albeit pre- post comparisons were not statistically different). Both comparison areas showed increases during that time in abandoned autos and illegal dumping. Also, the number of calls for service per incident of illegal dumping or abandoned autos trended upward in CPN, from 6.6 calls per incident in 2016 through 2018, to 7 calls per incident in December 2018 through March 2019, to 17.5 between March and July 2019, suggesting increased reporting practices.

Table B-1. Police Data Assessing Impact of Early Action Project

	Average # Events per Month		
	Before (Jan 2016 to Nov 2018)	During (Dec 2018 to Jul 2019)	Percent Change
	Castle Point		
Illegal Dumping CFS	1.171	1	-14.6 %
Abandoned Auto CFS	4.617	4.125	-10.7%
Part 1 Incident	12.285	10.875	-11.5%
% Dumping Cleared	3/5	0/0	---
	Comparison Area 1		
Illegal Dumping CFS	0.14	0.5	257.1%
Abandoned Auto CFS	1.441	1.75	21.4%
Part 1 Incident	7	7.4	5.7%
	Comparison Area 2		
Illegal Dumping CFS	0.51	0.63	23.5%
Abandoned Auto CFS	1.617	2.625	62.3%
Part 1 Incident	10.2	13.4	31.4%

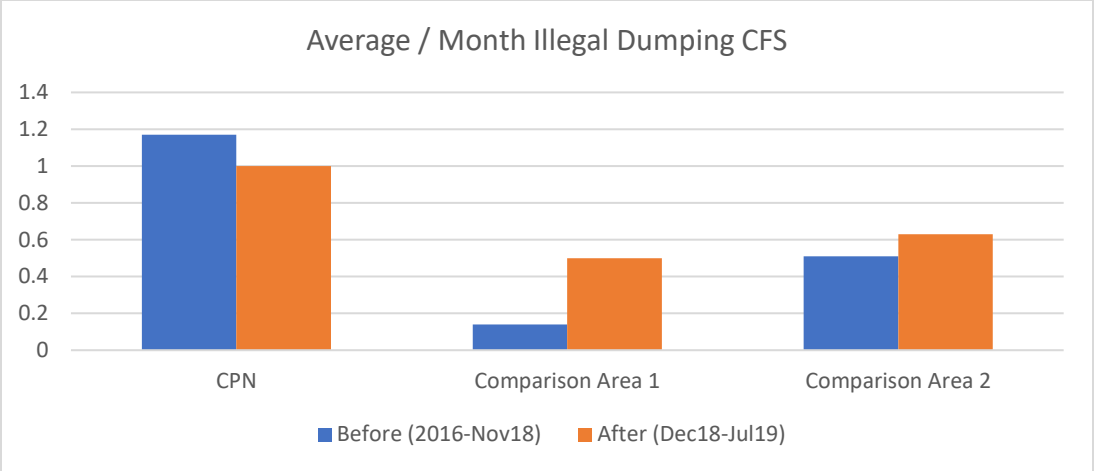


Figure B-1. Average Calls for Service per Month for Illegal Dumping

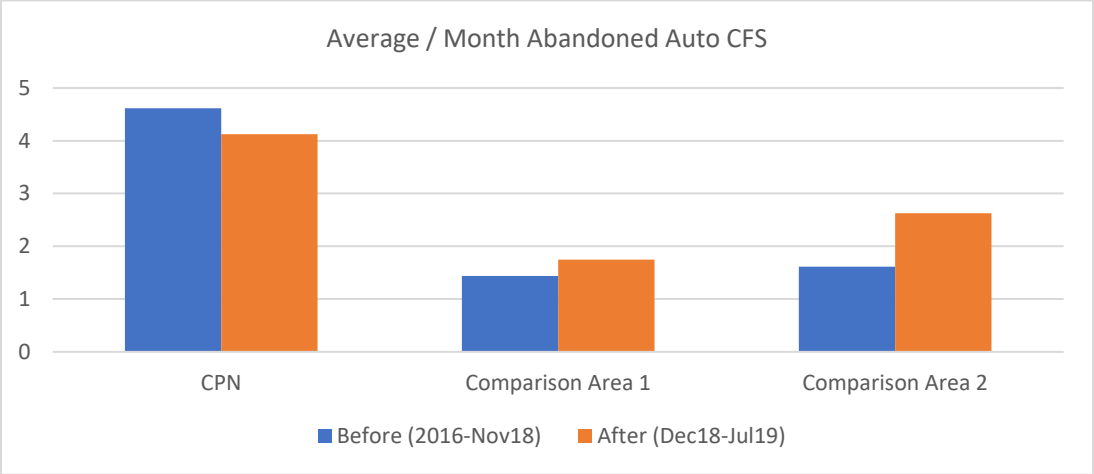


Figure B-2. Average Calls for Service per Month for Abandoned Automobiles

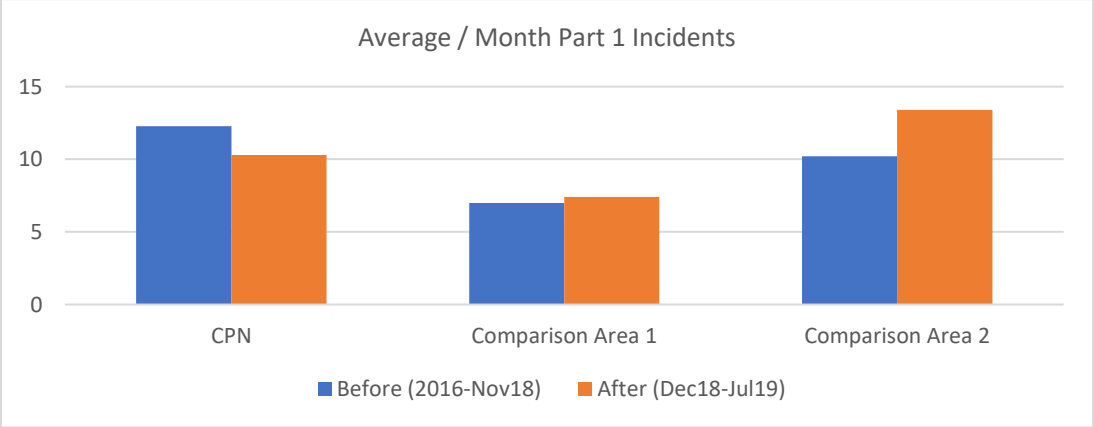


Figure B-3. Average per Month for Part 1 Offenses

Supplementing police data, the research team systematically recorded observations about physical and social disorder and order at baseline in summer 2018 and again in summer 2019. Comparisons between 2019 and 2018 showed that within CPN, the amount of physical disorder on street segments and the proportion of physical disorder relative to the number of residences significantly declined, while signs of social order and physical order showed nonsignificant increases. Compared to the two comparison areas, CPN fared better. One comparison area showed no significant changes on any outcomes. The second comparison area did experience a significant decline in the amount of physical disorder, but in 2019 showed an increase in the proportion of residences on street segments with physical disorder problems. Thus, outcomes from both police and observational data lend support that the initial efforts to address illegal dumping and increase reporting improved CPN residents' experiences with physical disorder, abandoned vehicles, and illegal dumping.

Table B-2. Differences Across Areas

	Castle Point Neighborhood				Comparison Area 1				Comparison Area 2			
	Mean At Baseline	Mean After Early Action Plan	t	Percent Change	Mean At Baseline	Mean After Early Action Plan	t	Percent Change	Mean At Baseline	Mean After Early Action Plan	t	Percent Change
Amount Physical Disorder	4.19	3.31	5.070***	-21%	3.59	3.44	0.363	-4%	3.89	2.28	4.382***	-43%
Physical Disorder Proportion	0.95	0.75	2.14*	-21%	0.49	0.47	0.32	-4%	0.42	0.69	-4.22**	64%
Physical Order Proportion	0.57	0.66	-1.53	16%	0.79	0.78	0.06	-1%	0.67	0.78	-2.41*	16%
Social Order Coder Rating	0.89	0.91	-0.172	2%	1.10	1.18	-0.375	7%	0.84	0.94	-0.626	12%

*NOTES: *p ≤ 0.05, **p≤ 0.01, ***p ≤ 0.001*

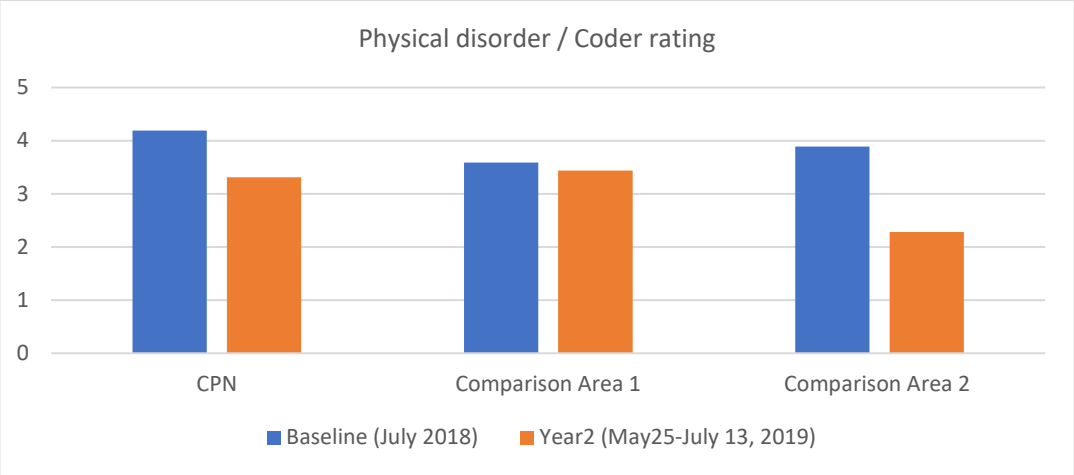


Figure B-4. SSO Physical Disorder 2018 versus 2019

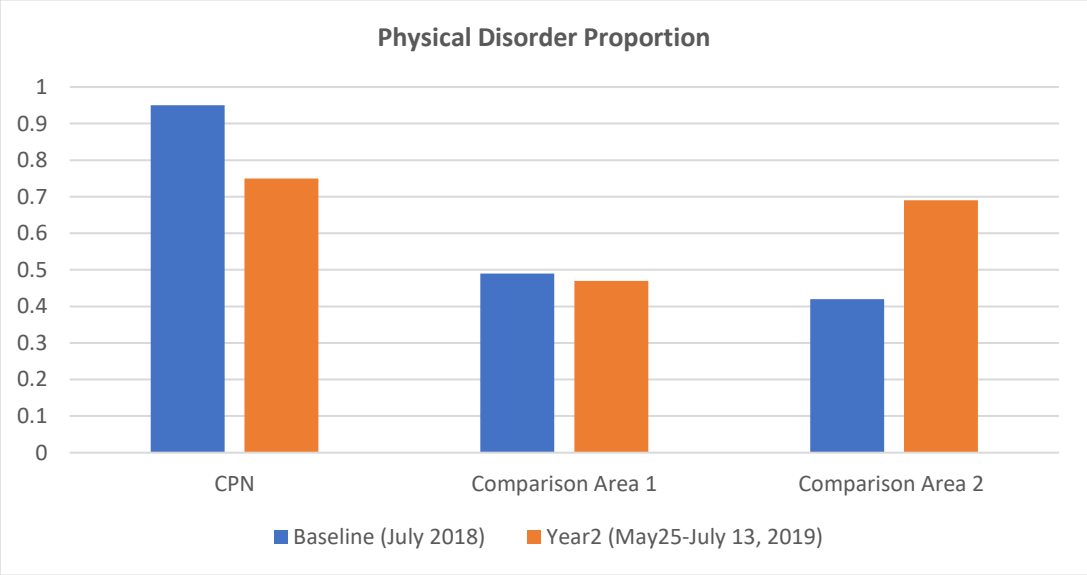


Figure B-5. Physical Disorder Proportion 2018 versus 2019