SOUTHERN ILLINOIS UNIVERSITY
SIU **COLLEGE OF HEALTH**
CARBONDALE **AND HUMAN SCIENCES**

Carbondale Gun Violence Needs Assessment Report

A Report for the City Council

Tammy Rinehart Kochel, PhD
Matthew West, PhD
Sarah Buila, PhD
Justin McDaniel, PhD
Paul Brinker, M.S.W.
Seyvan Nouri, PhD
Jacob Halvorson, M.A.
Mike Toro-Alvarez, M.S.
Rasheed Ibrahim, M.A.
Rachel Rearden, M.A.
Colleen Bader, M.A.

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Executive Summary

Gun violence is a public health concern in Carbondale. Residents are concerned about and impacted by gun violence. One in three residents who answered the survey report being personally affected by gun violence. One in five Carbondale residents (20%) report that gun violence is a major problem in Carbondale and an additional 25% consider gun violence a moderate problem. Calls to police about shots fired have been rising during the last three years. Each week, Carbondale experiences an average of five gun-related incidents, two gun-related arrests, and two guns seized. This issue not only generates a great deal of concern among residents, it also consumes a substantial amount of city police resources.

The nature of gun violence differs across the city. Study areas 1, 6, 7, and 10 (shown in figure 1) cumulatively account for one-third of the city in size and only about half of the city's households, but 94% of the city's shots fired or gunshot wound calls for service. Thus, gun violence concentrates more heavily in some areas. Residents are aware of this disparate distribution and point to these areas as places with the highest gun violence problems. Outside of these four areas, the impact is felt, but to a lesser extent. The report prioritizes explaining the nature of gun violence within these highest gun violence impact areas.

Area 1 experienced an increase in gun violence during 2019 to 2022. Residents identified several hot spot locations (notably around W. Cherry St) and analyses of shots fired calls for service showed a dense cluster that has emerged in area 1 during the last 18 months. Shootings in area 1 seem to have a basis in parties that serve as crime attractors. A large number of people gather at a party and then individual party-goers have a conflict that escalates into shots fired. Also, cannabis and other drugs appear to be associated with the gun violence in this area.

Area 6 was identified by residents across Carbondale (except by area 1 residents) as the area suffering with the biggest gun violence problem. Most residents in area 6 have been personally impacted by gun violence and one-third have been recent crime victims. Residents point to a problem area near Attucks Park. Area 6 experiences a high proportion of drive-by shootings and involvement by repeat suspects. Residents are concerned about youth involvement in gangs and guns. The impression from the totality of these incidents is that a substantive number of incidents may be motivated by group disputes or ongoing conflict between acquaintances.

Compared to the other high gun violence impact areas, area 7 has relatively fewer problems. Residents were most concerned about specific problem areas in the vicinity of N. Oakland Ave, W. Sycamore St., and N. Poplar St. Repeat suspects are not common in area 7 and arrestees for gun offenses are younger. Gun violence in area 7, like in area 1, may be derived from conflicts that arise at parties.

Area 10 has been a persistent area of gun violence in Carbondale and repeat suspects are a problem in this area. Shootings occur from vehicles and outside of homes and often involve people who know each other. In this area, most arrestees are not from Carbondale. Residents see people buying and selling drugs daily. Thus, gun incidents likely are related to drugs as well as group disputes or ongoing conflicts.

We highlighted a multitude evidence-based approaches that could be adopted to the specific types of gun violence happening in the high violence areas. Strategies include adaptations to the built environment focused on traffic flow, housing, and vacant lots; repeat offender initiatives; conflict resolution; hospital-based violence intervention; situational crime prevention and hot spots strategies;

interventions tailored to youth violence prevention; drug-related and substance use interventions; and community organizing to promote safety.

The purpose of the Carbondale Gun Violence Needs Assessment was to conduct a multifaceted analysis of the nature of the gun violence problems in Carbondale relative to current approaches and potential gaps in evidence-based services within the city. To comprehensively study this issue, a team of Southern Illinois University researchers examined the following data sources:

- 2020 US Census data by Census Tract
- Police calls for service for shots fired from January 1, 2019, to March 31, 2022
- Firearm-related police offense data from January 1, 2019, to March 31, 2022
- Deidentified arrest data from January 1, 2019, to March 31, 2022
- Confirmed Shootings from January 1, 2020, to July 30, 2022
- Streetlight data
- Seized firearms data
- SIUC Police data on firearms arrests/seizures/theft
- Carbondale GIS Land use data
- Summer 2022 Carbondale household survey (n= 1208 respondents) (See Appendix)
- 11 interviews with key stakeholders
- 1 focus group with key stakeholders
- Jackson County State's Attorney's office case resolution data for arrest reports between January 1, 2019 and March 28, 2022
- Jackson County Ambulance Dispatch Data (heavily redacted)

Our effort balanced learning as much as possible about the nature of gun violence in Carbondale and producing a comprehensive report against the need to do so expeditiously so that the city could make informed decisions about how to direct resources to address ongoing gun violence problems. We divided Carbondale into ten geographic areas of study so that we could drill down into the specific nature of the problem and best understand how residents experience gun violence where they live, while protecting anonymity of survey respondents.[1] Figure 1 depicts the ten areas and table 1 provides the approximate size of each area.

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[1] When creating the geographic study areas, we took into account a number of factors, such as areas designated by Neighborhood Scout as neighborhoods, police districts, Census track areas, the type of facilities and land use (e.g. business district, SIUC, agricultural spaces), the nature of the residential areas and housing within the spaces (e.g., historically student housing, apartments, older bungalow style homes), and natural boundary points (e.g., major roads).
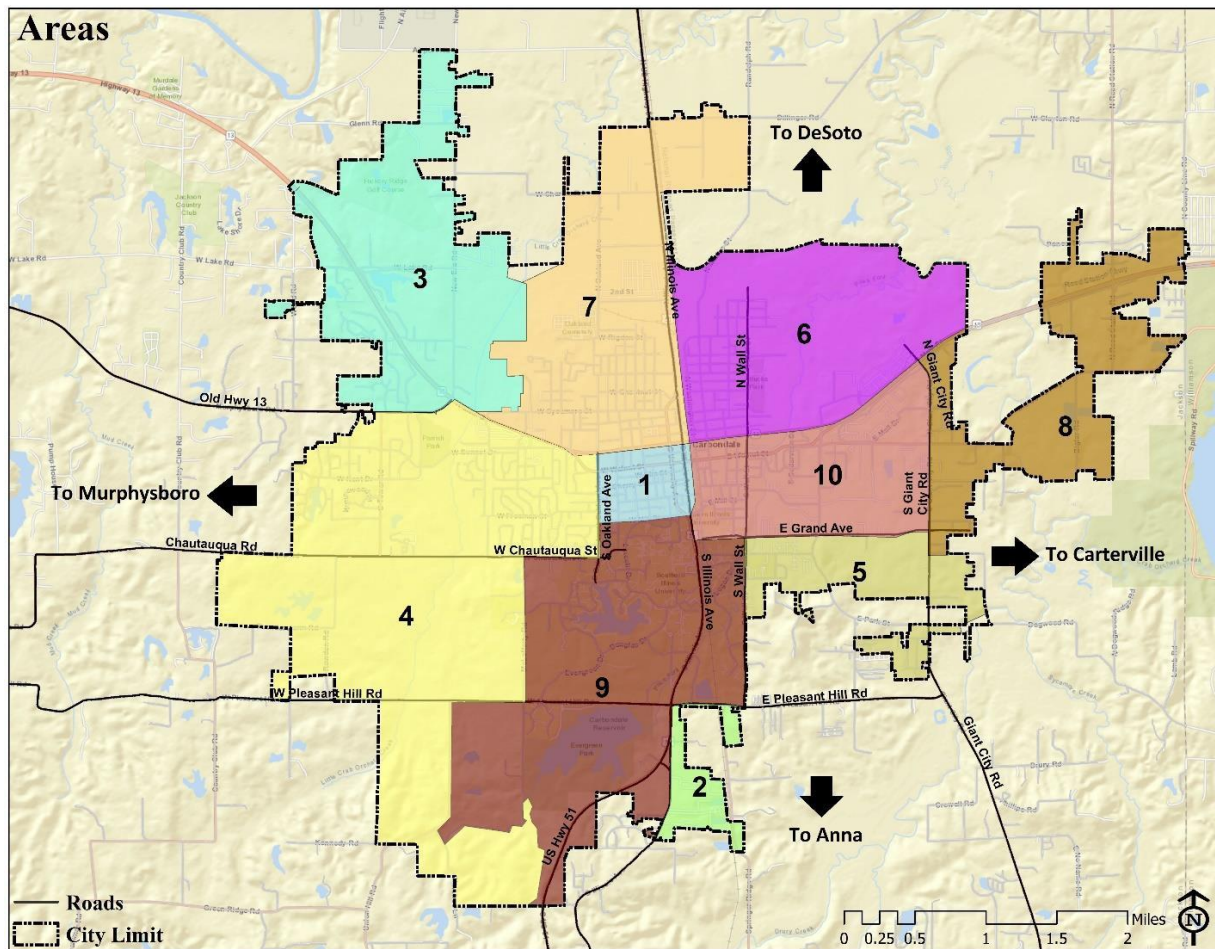
Figure 1: Study Areas in Carbondale

Table 1: Size of the Study Areas in Carbondale

Study Area	Estimated Area (sq miles) *	Proportion of Area	Households Receiving Water Bills**	Proportion of Households
1	0.34	1.7%	709	10.5%
2	0.28	1.5%	34	0.5%
3	2.37	12.2%	544	8.1%
4	4.79	24.7%	1767	26.2%
5	0.82	4.2%	621	9.2%
6	2.19	11.3%	454	6.7%
7	2.39	12.4%	1110	16.5%
8	1.50	7.8%	276	4.1%
9	3.25	16.8%	129	1.9%
10	1.42	7.3%	1094	16.2%

*NOTE: These estimates are derived from ArcGIS maps created for the study and do not reflect Census or other official data.

**NOTE: Several locations in Carbondale have a property manager that receives the water bills for many units. Consequently, those locations are counted as one unit in these figures.

Report Organization

This report integrates knowledge across many data sources. We have organized our findings to provide a broad summary of gun violence across the city, but our focus is on examining the nature of gun violence across geographic areas where it is most impactful. We describe the incidence of gun violence, trends and patterns, likely drivers or gun violence, harms associated with gun violence, including residents' perceptions and experiences citywide. Then, we drill down to focus on the areas of Carbondale experiencing the most gun violence to describe more intimately and specifically the experiences with and nature of gun violence. The more tailored the solutions to crime, meaning the ability to apply evidence-based solutions to the specific neighborhoods and individuals at risk for involvement, the more effective they tend to be (Skogan and Frydl, 2004; Webster 2022). Thus, to provide recommendations that will be most effective, we aimed to understand the nuances occurring in various parts of Carbondale.

Gun Violence Trends Across the City of Carbondale

Incidence of Gun Violence Citywide

The incidence of and harm from gun violence in Carbondale is sobering. For example, the gun homicide rate in the city is higher than the national rate, albeit lower than the state rate. Nationally, in 2020 (the most recent year that data are available), the gun homicide rate was 5.9 gun homicides per 100,000 population, while in Illinois the rate was 14.1 (CDC, 2020). Carbondale's gun homicide rate in 2020 was 9.2 per 100,000 population.

Calls to the police about gun violence indicate that it may be increasing. Although not a perfectly linear trend, the number of shots fired calls for service to police increased by approximately 10 calls per year since 2019, when there were 144 shots fired calls for service. According to our forecast model, there will be approximately 180 shots fired calls for service in 2022. In January 2022 alone, there were over twice as many calls about shots fired as there were in any prior year.

Based on data from the Carbondale Police Department from January 2019 through March 2022, there is an average of about five gun-related incidents (n=804 total), two arrests for a gun-related offense (n=289 total), and two guns seized (n=321 total) each week. Most gun-related incidents are reported as "shots fired" (68%; n=549). Of these types of incidents, only about 1 in 10 results in charges being sent to the State's Attorney. There is often a lack of evidence or witnesses, and, in some instances, a lack of willing cooperation from victims and witnesses. The most common outcome is that officers write a report, which can be helpful for future cases.

These data, however, tell a partial story about the incidence of gun violence as few residents who have heard gunshots where they live report that to police. Approximately 1,100 residents answered the question asking them to estimate the frequency that they have heard gunshots where they live during the last year. Just over one-quarter of residents (27%) said that they have never heard gunshots where they live. Among remaining residents, 3% say that they hear gunshots daily, 12% hear them weekly, 21% hear gunshots several times per month, and 37% hear gunshots less than once each month. Among residents who hear gunshots sometimes, only one-quarter have reported at least one of those occurrences to police. Those who have not reported gunshots reason that someone else will/has reported the incident (28%); 14% did not report because they could not ascertain where the shots were

fired—perhaps being far away. Twelve percent said that they didn't want to get involved; 7% feared retaliation if they reported the incident to police. However, 13% of residents said that they didn't report because they do not trust the police, while 24% think that the police could not do anything and so they didn't call them.[2] This feedback suggests that the official records of gunshots and gun violence may be incomplete.

Temporal Trends

A temporal analysis showed that shots fired calls for service spiked around the beginning of the Southern Illinois University Carbondale (SIUC) fall semester, at the end of fall semester, and at the end of the spring semester. Shots fired calls for service were also more likely to occur on weekends during the academic year compared to the non-academic year, and most of these incidents occurred between 7 PM and 6 AM. Each year in Carbondale, there is an influx of students and its natural concomitants, such as parties. This phenomenon increases social interaction among students and community members and, in turn, the potential for interpersonal conflicts. When a gun is available, conflicts that may have otherwise resulted in assault and battery result in gun violence. This was a theme noted in interviews and the focus group, and the pattern in shots fired calls for service generally corroborates it. Notably, SIUC students were very rarely arrested in connection to a shots fired incident— only two arrests of 71 associated with a shots fired incident 2019 through March 2022 were SIUC students. Student involvement appears to be incidental, as party hosts.

Contributing to Gun Violence

Residents provided their views about what drives gun violence where they live. See figure 2. Key drivers are perceived to be drug activity, fights, criminal groups, and retaliation or revenge. These are the same drivers conveyed by key stakeholders during our interviews and focus group, who emphasized conflict and retaliation. Key stakeholders consistently described conflict between youth derived from gang affiliations or group/family/friend feuds as the basis of gun violence across Carbondale. The key stakeholders were disinclined to tie the conflicts to a specific gang in Carbondale, rather described local groups of individuals who were loosely associated and hung out with each other. Their view is that youth involved in group-related gun violence are unable to disengage from a dispute or address issues during an argument and thus conflict and retaliation persist.

A majority of key stakeholders also described that tensions often arise when local residents, students, and other individuals, especially of different cultures, ethnicities, and races do not get along. Frequently, key stakeholders felt that conflict occurred organically, such as when individuals attend parties or other large gatherings where a minor offense leads to a dispute, and people - who are impaired by drinking and also armed - escalate the conflict to the point of a shooting. Interviewees described that large parties are sometimes hosted by SIUC students and widely attended by local residents across the city, inadvertently bringing together individuals who previously had a dispute. This perception matches the temporal trend found in the shots fired data that suggests peaks occur during the highest social engagement periods of the academic calendar—when students return to the campus in fall, when they complete the fall semester, and at the beginning and end of spring semester.

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[2] Residents of high crime areas, minority residents, and hot spots residents who are younger, more educated, who are more fearful of crime, who perceive police injustice, and who perceive higher levels of social disorder tend to have lower satisfaction with police (Haberman et al., 2016).
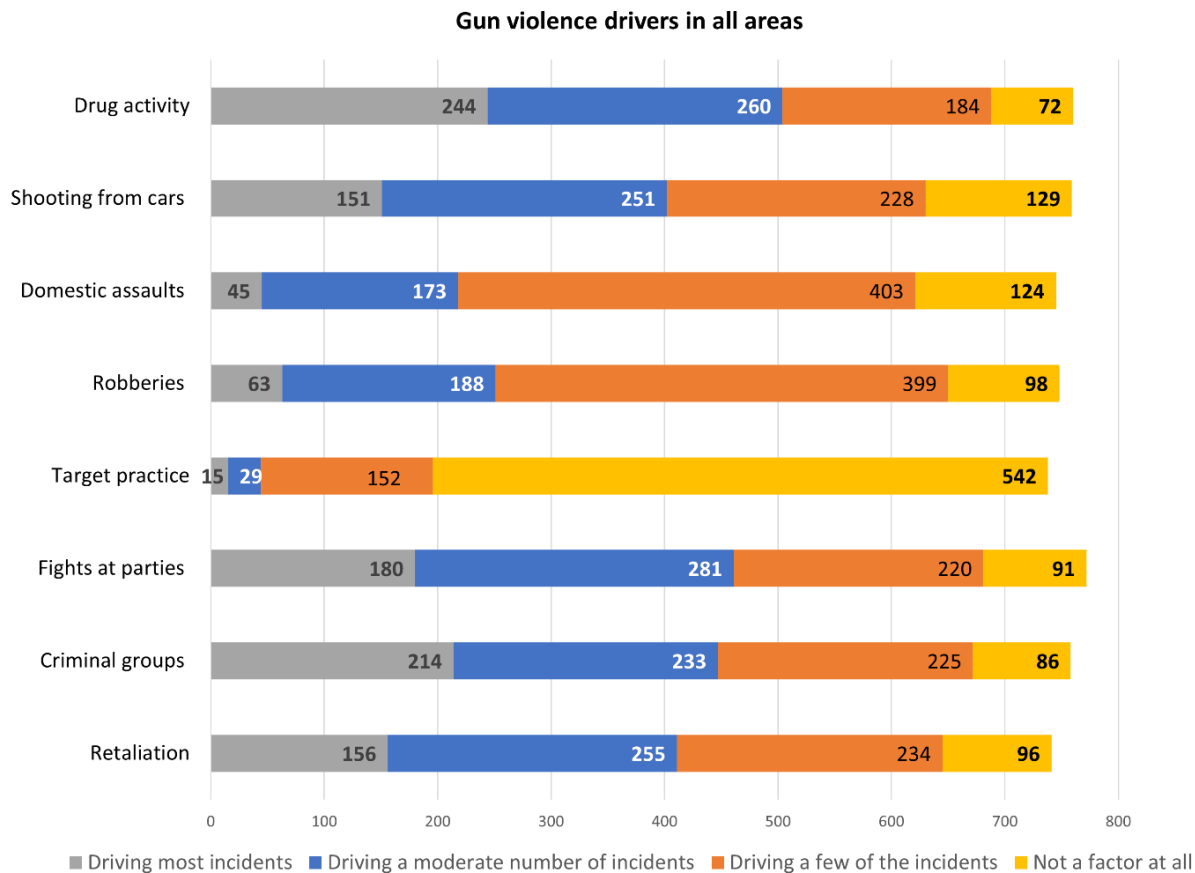
Gun violence drivers in all areas

Figure 2: Summary of Residents' Perceptions of Gun Violence Drivers in Carbondale

The most prevalent drivers are also consistent with the circumstances described in police reports for the confirmed shootings that we examined in Carbondale (January 2020 through July 2022). Among events reported to police, a subset could be verified by police as having compelling evidence (e.g., injured victim, property damage, video evidence) that a shooting occurred. From 2020 to the present, Carbondale Police Department systematically reviewed offense reports for this evidence to flag confirmed shootings. Across the 2.5-year period, there were 146 confirmed shooting incidents.

A very high proportion, 34% of the confirmed shooting incidents, involved suspects shooting from a vehicle, 13% involved shooting from outside a home, and 10% involved people shooting at one another. These circumstances would fit the narrative of fights and retaliation. Notably, one quarter (25%) of shootings involved people who police could be certain were known to each other. The reason behind the incidents could not be identified clearly by police for most confirmed shooting incidents (57%), but for 28% of confirmed shootings, the basis of the shooting was determined to be a dispute or conflict, 8% were tied to a party, 5% were clearly retaliatory incidents, and about 5% were described as incidents of accidental or careless discharge by the shooter. Drugs, mostly cannabis, were identified as involved in 9% of the confirmed shootings. In about 8% of incidents, the circumstances surrounding the shooting were unknown to police. Other shooting incidents included domestic incidents, reckless shootings, one home invasion, suicide, and homicide.

Suspects and Arrestees

Among confirmed shooting incidents, police identified suspects for more than half (57%) of incidents across the last 2.5 years, and then made an arrest for approximately one in every five incidents in recent years (ranging from 18.5% for the more recent 2022 incidents to 34% in 2020—bearing in mind that investigations may be ongoing) (See table 2). Often, suspects were not identified at the time of the incident, rather were identified after officers investigated the incident. Lack of on-scene information about suspects is most often due to a lack of cooperation from parties on the scene. Incident reports frequently noted lack of cooperation or knowledge from confirmed shooting victims or witnesses about who was involved in the shooting. This might also be why only about 1 in 10 shots fired or gunshot wound calls for service resulted in charges sent to the State's Attorney.

Table 2: Confirmed Shooting Incidents, Suspect Information

	2020		2021		January – July 2022		Total	
	N	%	N	%	N	%	N	%
Confirmed Shootings	59		60		27		146	
Suspect(s) Identified	34	57.6%	32	53.3%	17	63%	83	57%
Suspect(s) Unknown	25	42.4%	28	46.7%	10	37%	53	36%
Total Incident w/at least One Arrest	20	33.9%	14	23.2%	5	18.5%	39	27%
Incidents w/ Multiple Arrests	8	13.6%	3	5%	2	7.4%	13	9%

Individuals arrested for a gun-related offense in Carbondale between January 2019 through March 2022 were, on average, 27 years old (range=14 to 80 years), 83% were Black, 84% male, most were Carbondale residents (71%), and also were charged with an illegal possession offense (56%; sometimes in addition to other charges). Individuals arrested in connection with a shots fired or gunshot wound call for service were younger than gun offenders arrested in connection to a different type of call for service (e.g., assault, unlawful use of a weapon, controlled substance) (26 years old on average compared to 28 years old on average, respectively). This slight difference may, in part, be explained by youth involvement. Juveniles account for 11% of arrestees for firearm offenses *not* initiated by a shots fired or gunshot wound call, and 16% of arrestees involved in a shots fired or gunshot wound incident.

A majority of residents estimate the 18-25 age group as being most involved in gun violence (62%). This does approximately align with the median age of individuals arrested for gun-related offenses, which ranges from 24 (area 7 and area 10) to 26 (area 1 and area 6). Juveniles compose a small proportion of arrests (12%), albeit a higher proportion of arrests associated with shots fired calls. Juvenile arrestees are like adult arrests on factors like sex, incident area, and illegal possession charges. Despite accounting for a relatively small portion of arrests, residents perceive that a concerning number of high-school aged males are involved with guns and to a lesser extent, gangs. More than three quarters of residents who felt that they could estimate reported that at least some high-school aged males carry guns, with one-third of these residents estimating that more than 10% of high school aged males in their area do so. Similarly, among residents who felt that they could estimate high schoolers' gang involvement, 29% believe that more than 10% of high school aged males are involved with a gang or criminally active group.

We identified an important pattern of repeat offending, with 15 individuals appearing as suspects in multiple confirmed shooting incidents from 2020 through July 2022. The repeat suspects were frequently suspected of offending with each other as well as with other suspects. In other words, the shootings involving these individuals typically involved groups as offenders or victims or both. Most of the repeat suspects (n= 9, 60%) were suspects in two incidents during our study period. Three individuals (20%) were suspected in three incidents, two individuals (13%) were suspected in four incidents, and one individual was suspected in eight incidents during the 2.5 year period. Therefore, a single suspect was believed to be involved in 6% of all the confirmed shooting incidents that occurred in Carbondale between January 2020 and July 2022. Six repeat suspects (40%) also appeared as victims. In one case, a victim was involved in three different incidents inside of six months. This evidence may corroborate a hypothesis that many shootings are caused by conflict and retaliation.

Source of Guns

The data available to the team provided very limited insight about the source of guns used to commit violence in the area. Most firearm seizures are handguns (80%), followed by rifles (10%) and shotguns (10%). Most firearms are seized as evidence (57%), while the rest are held for safekeeping (23%), recovered stolen (13%), or found property (7%). Key stakeholders relayed an impression that easy access to guns is facilitating the many different forms of gun violence in Carbondale. They perceive that individuals are accessing guns used in violence via burglaries of homes or theft from vehicles, through straw purchases—meaning a gun is purchased legally by one person, but is intended for another's use. Generally, the straw purchaser either sells the gun to the other person, who often is a felon who is not legally permitted to own a gun *or* if the purchaser is a friend, relative, or significant other to the shooter, they may give the gun to the shooter and then report the gun stolen.

Harm to Community

Gun violence concerns communities largely because of the considerable harm that results from shootings—death, injuries, property damage, and fear. Confirmed shootings primarily came to the attention of police as a shots fired call for service but were reported in other ways as well. Table 3 provides the breakdown by year of the origin of confirmed shootings.

Table 3: Original Complaint Type for Confirmed Shootings by Year

	2020		2021		January – July 2022	
	N	%	N	%	N	%
Shots Fired	35	59.3%	26	60%	16	59.3%
Stab/Gun	8	13.6%	11	18.3%	2	7.4%
Other	16	27.1%	13	21.7%	9	33.3%

Table 4 estimates the harm associated with confirmed shooting incidents, based on whether a fatal injury, nonfatal injury, property damage, or no apparent injury or damage occurred. While the proportion of confirmed shootings that resulted in fatalities was relatively low (5%), approximately a quarter of incidents resulted in a nonfatal injury and just over half of incidents resulted in property damage. Thus, there was a significant level of harm from these incidents. Notably, just over one in four

(26%) confirmed shootings came to the attention of the police because a person came to the hospital with a gunshot injury or was transported to the hospital because of their involvement in the event.

Table 4: Confirmed Shootings and Associated Harm

	2020		2021		January – July 2022		Total	
	N	%	N	%	N	%	N	%
Confirmed Shootings	59		60		27		146	
No Injuries	15	25.4%	7	11.7%	3	1.1	25	17.1%
Property Damage	28	47.5%	37	61.6%	14	51.9%	79	54.1%
Non-Fatal Injury	13	22%	14	23.3%	8	29.6%	35	24.0%
Fatal Injury	3	5.1%	2	3.3%	2	7.4%	7	4.8%

Gun violence also produces harm in communities that is a bit more challenging to quantify by generating fear and impacting community well-being. One in five Carbondale residents (20%) report that gun violence is a major problem in Carbondale and an additional 25% consider gun violence a moderate problem. Eleven percent of Carbondale residents report hearing gunshots in their area at least weekly. One in three residents report being personally affected by gun violence. About half of Carbondale residents that took the survey feel somewhat unsafe (27%) or very unsafe (27%) walking alone in the area they live at night. More than half of residents (52%) claimed that gun carrying where they live is at least somewhat common. Most residents, over 70%, identify protection as a reason for gun ownership in their area. The findings convey a need to intervene and prevent gun violence and focus on reducing both tangible harm in the form of injury and property damage, but also to work to improve residents' feelings of safety and concerns about gun violence.

Drilling Down to the High Gun Violence Impact Areas

Incidence and Geographic Distribution of Gun Violence

While these statistics about gun violence clearly demonstrate that the problem is of high importance citywide, it is important to point out that the prevalence, nature, and harm from gun violence is not uniformly distributed citywide. Research consistently shows that crime and violence concentrates in micro places (Weisburd 2018). In Carbondale, across multiple sources of data, areas that disproportionately experienced the highest levels of gun violence during the last three years were areas 1, 6, 7, and 10 (refer to figure 1). As shown in figure 3, areas 1, 6, 7, and 10 collectively accounted for 83% of all shots fired calls for police service (events reported to police or identified by police) and 94% of shots fired or gunshot wound calls for service that resulted in at least one arrest. Incidents happening in these areas accounted for 90% of arrests for gun offenses. Yet, these areas combined account for only one-third of the geographic area within Carbondale and half of the residential households (See figures 3 and 4).
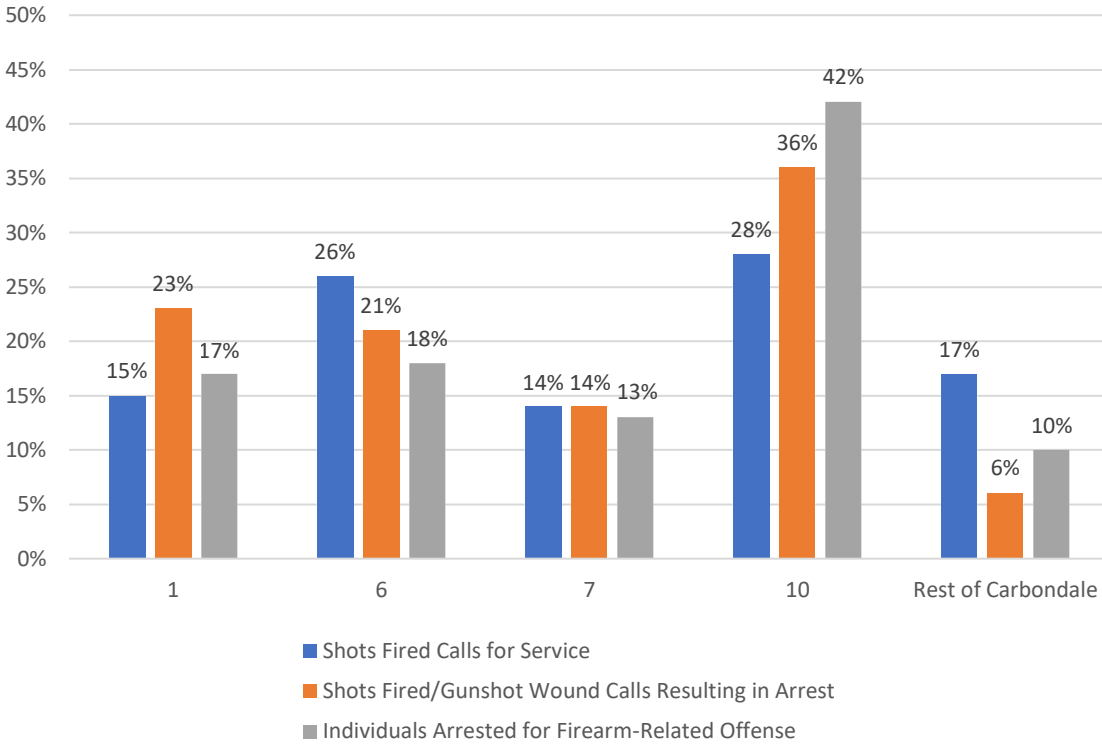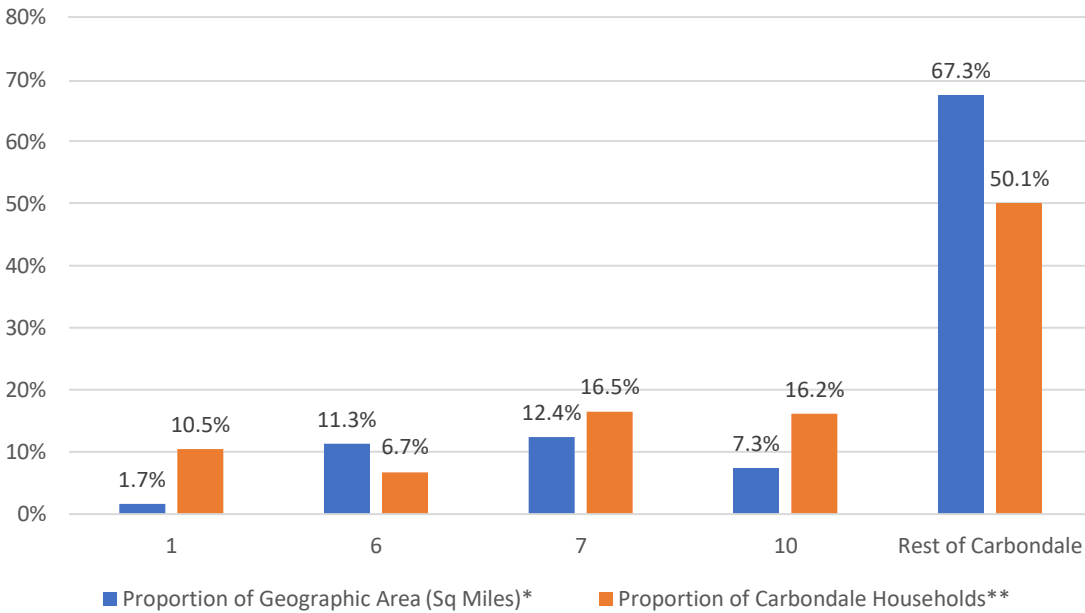
Figure 3: Police Data by Area (January 2019 to March 2022)

*NOTE: These estimates are derived from ArcGIS maps created for the study and do not reflect Census or other official data.

**NOTE: Several locations in Carbondale have a property manager that receives the water bills for many units. Consequently, those locations are counted as one unit in these figures.

Figure 4: Proportion of Population and Geographic Area for High Gun Violence Impact Areas

Showing the same disproportionate patterns, table 5 provides the geographic distribution of the confirmed shootings by year. Area 10 exhibited about one-third of the confirmed shootings citywide across each of the last 2.5 years, but accounts for only 16% of the city's households and 7% of its geographic footprint. Areas 1 and 6, and to a lesser extent area 7, also hosted a disproportionate share of confirmed shootings relative to the proportion of households and geographic footprint.

Table 5. Confirmed Shootings by Area by Year

	2020		2021		January – July 2022		Total	
Study Area	N	%	N	%	N	%	N	%
1	9	16%	17	27%	5	18.5%	31	21%
6	16	28%	13	21%	6	22%	35	24%
7	9	16%	4	6%	5	18.5%	18	12%
10	18	32%	20	32%	9	33%	47	32%
Rest of Carbondale	5	9%	8	13%	2	7%	15	10%
Total	57	100.0%	62	100.0%	27	100.0%	146	100%

Residents are cognizant that gun violence in Carbondale, like most other places in the United States and elsewhere, does not uniformly occur across the city. We asked residents to identify the area with the biggest gun violence problems. Some residents identified more than one area as having the biggest problem with gun violence, but the highest proportions of residents reported areas 6 (47.5%), 1 (29%), 10 (25.9%), and to a lesser extent, 7 (17.2%). People living in area 1 identified area 1 as the area with the biggest gun violence problems, but residents across other areas focused most on area 6, including residents of area 6.
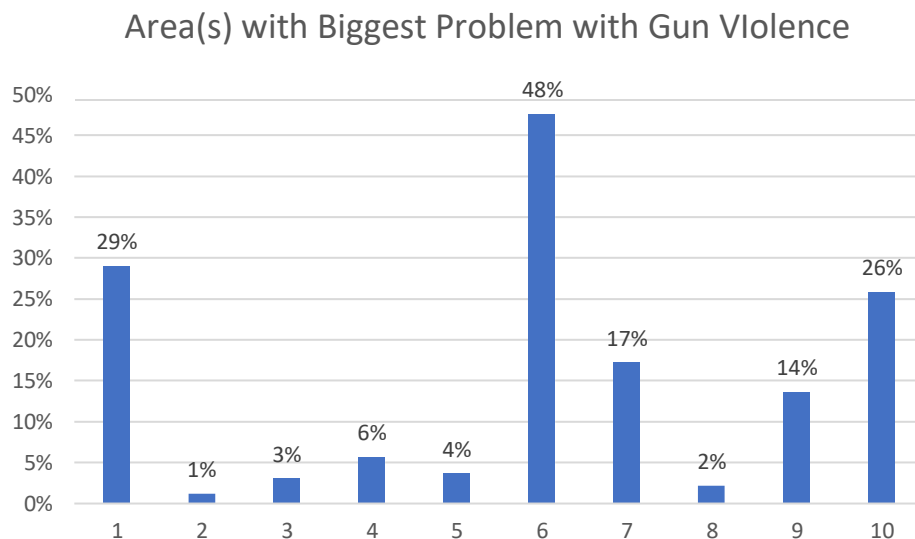

Figure 5: Community Survey Responses to Area with Biggest Problems with Gun Violence

Residents' self-reported personal experiences with gun violence confirm these views and the patterns in police data sources, that the highest proportion of residents impacted by gun violence live within areas 1, 6, 7, and 10 in Carbondale. In each of these areas, as many as half of responding residents reported being personally impacted by gun violence during the prior three years. In areas 1, 6 and 10, more than 20% of residents hear gun shots at least weekly. In areas 1, 6, 7 and 10, a substantial proportion of residents view gun violence as a major problem—from a low of 23% in area 7 to 54% of the residents in area 6 who feel that gun violence in that area is a major problem. Thus, the focal areas for the report are the areas of high gun violence impact: areas 1, 6, 7, and 10.
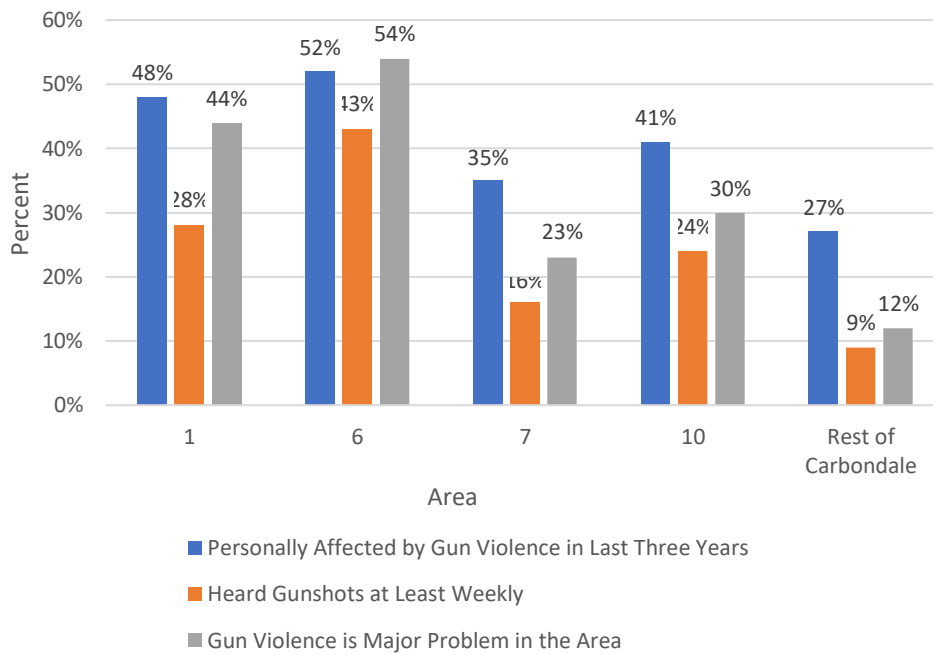

Figure 6: Residents' Experiences with Gun Violence

Temporal Trends

High crime areas are often stable over time—meaning the highest crime places stay high crime places and low crime places remain relatively low crime places over time. However, we studied whether hot spots of shots fired were stable or shifted during our study period (2019-2022). Breaking the study period in two time periods, we found a shift in where shots fired clustered geographically. In the most recent 18 months of data (July 16, 2020-March 31, 2022), shots fired calls for service clustered most densely in areas 1, 6, and 10, with high density hot spots in areas 6 and 1. This is a shift from the prior 18 months (January 2019-July 15, 2020). During that time, there was a clear hot spot in area 6 and a less intense concentration in 10, with only a small/moderately dense cluster in area 1. Hot spots by time are available in Figure 7. The most current timeframe is on top and the prior 18 months is depicted below that.

The Density of CFS per City Area Between July 16, 2020 and March 31, 2022

The Density of CFS per City Area Between Jan 2019 and July 15, 2020

Shots Fired (per .5 square mile)
- 2 - 17
- 18 - 45
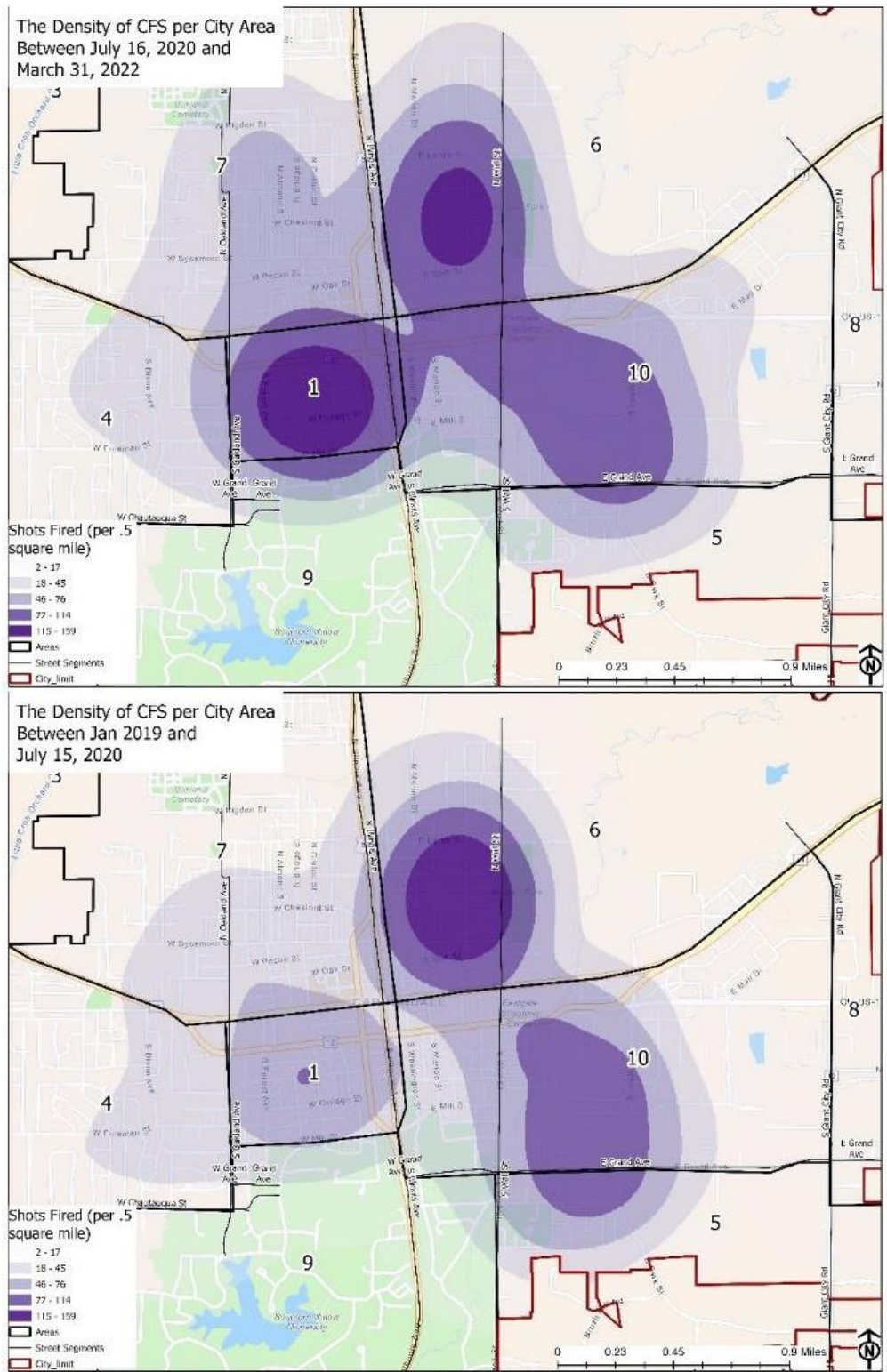- 46 - 76
- 77 - 114
- 115 - 159

Figure 7: Density of Shots Fired Calls for Service Earlier vs Most Recent 18 Month Period

Across recent years, area 1 (e.g., part of downtown and what has been termed informally by many residents as the Arbor District) has experienced an increase in shots fired calls for service, with 10 shots fired calls in 2019 but 31 by 2021. In this small geographic area, this equates to a density of 100 shots fired calls per square mile in 2021. See figure 8. As is apparent in figure 9, area 1 experienced a larger proportion of the calls citywide each year. Concurrently, areas 6 and 10 showed small declines in the number of calls for shots fired and in the proportion of citywide calls in those areas between 2019 and 2021. It is important to point out that COVID-19 was highly disruptive in 2020 and may be contributing to slightly different experiences in that year, particularly for the remaining areas of Carbondale.
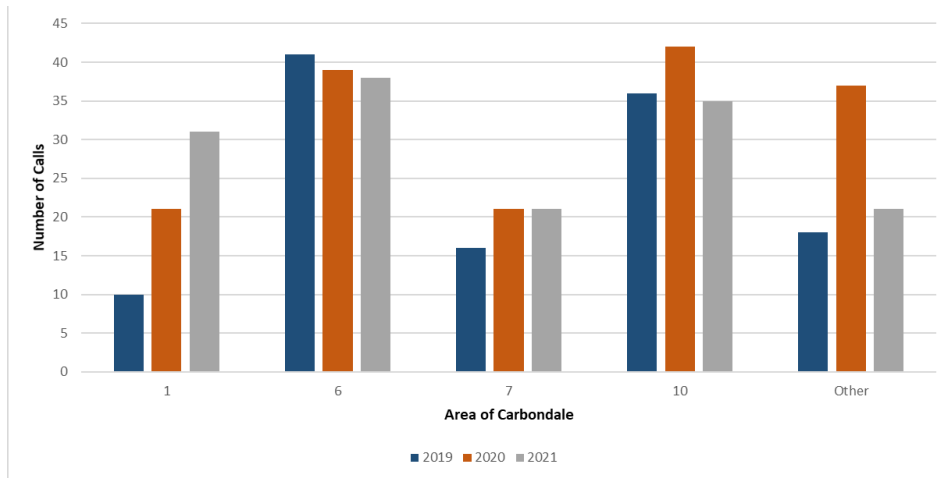

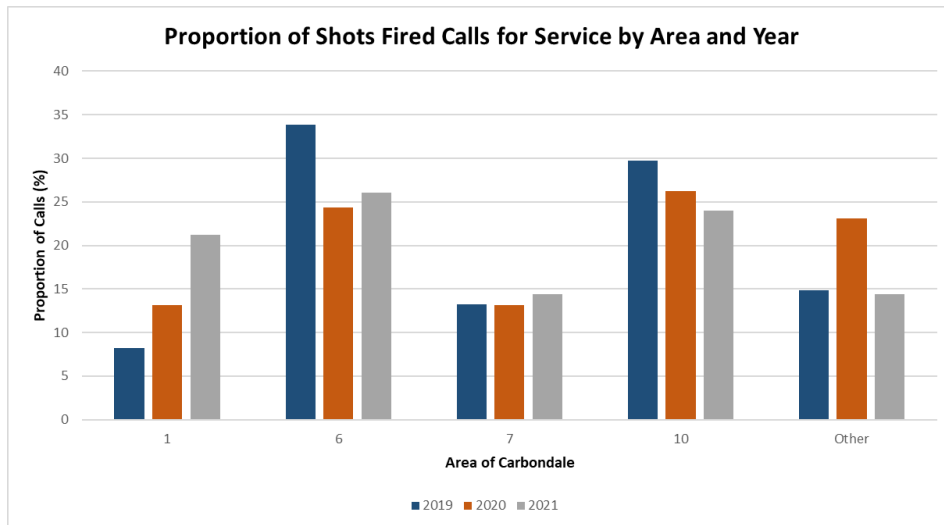*Figure 8: Number of Shots Fired Calls for Service by Area and Year*

Figure 9: Proportion of Shots Fired Calls for Service by Area and Year

Situational Circumstances and Drivers of Gun Violence

We were able to gather the most detailed information about situational circumstances from confirmed shooting data. Figure 10 summarizes the nature of the circumstances described within the police reports for the incidents. The nature of shootings in high gun violence impact areas were different than the shootings that occurred in the rest of the city. Specifically, areas with low gun violence prevalence were less likely to experience shots fired from a vehicle or from outside a residence or to be party-related.
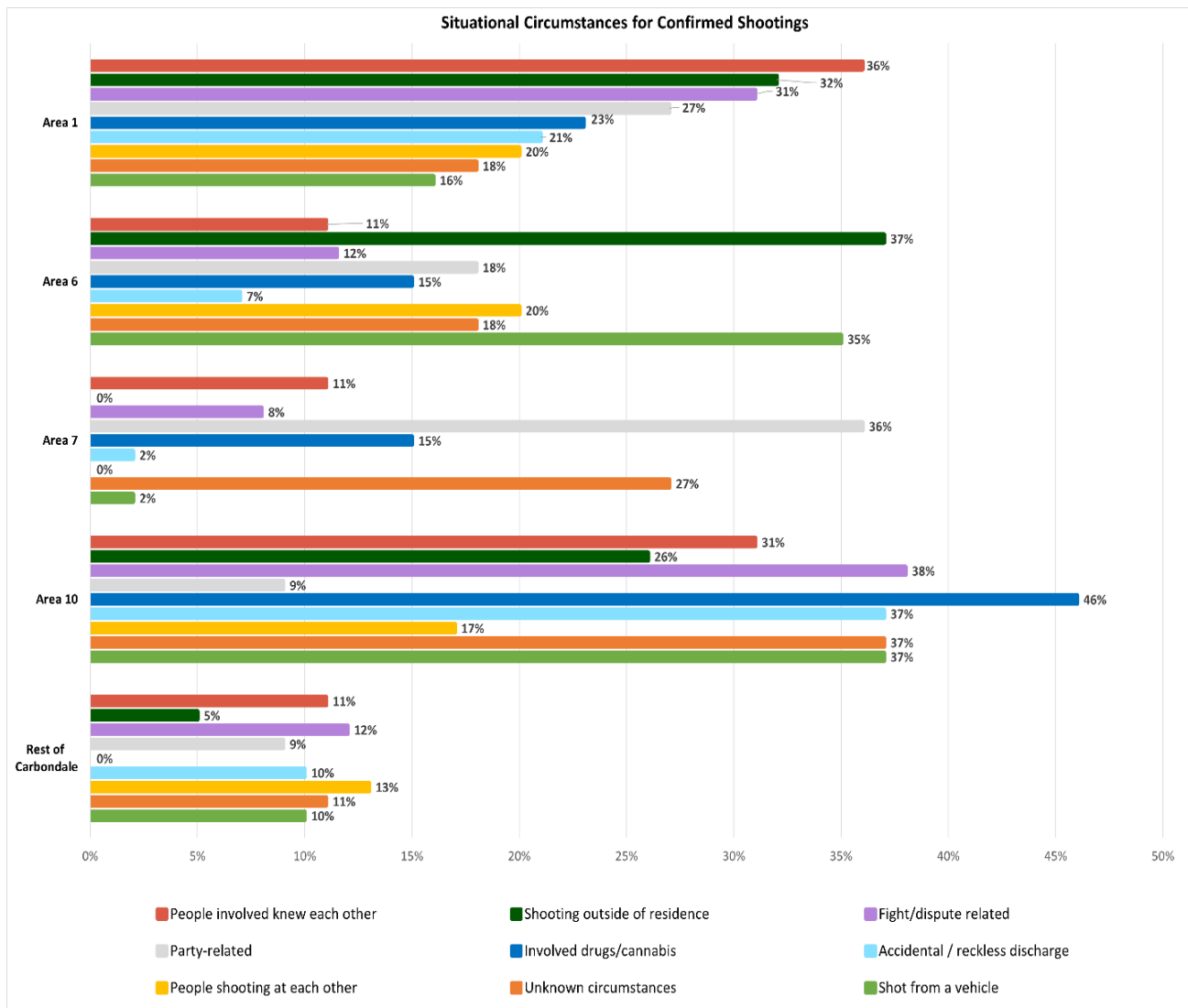
Area 1. Shootings in area 1 had a relatively high proportion of party-related incidents. Individuals involved in the incidents tended to know each other. A substantial proportion of shootings in area 1 also involved shootings from outside of a residence. Nearly one-third were documented as fight or dispute-related. Additionally, stolen firearms were noted as a precedent to shootings in area 1.

Area 6. Area 6 experienced a large proportion of shots fired from vehicles or outside of residences. Yet, a relatively low proportion of incidents were known by police to be a biproduct of a fight or dispute— this may be due to lack of information provided in many of these incidents. Police reports showed that a high proportion of retaliation-motivated offenses in the city occurred in area 6. The impression from the totality of these incidents is that a substantive number of incidents may be motivated by group disputes or ongoing conflict between acquaintances. Nearly half of repeat suspects were involved in incidents within area 6.

Area 7. Area 7 stood out relative to the remaining higher gun violence problem areas in the proportion of incidents that were party-related; however, many incidents in this area had unknown circumstances.

Area 10. Area 10 experienced a higher proportion of shots from vehicles and outside of residences and incidents involving people who knew each other. A high proportion of incidents in this area were clearly fight or dispute related. There were also a substantial number of accidental or reckless gun use incidents in area 10. Notably, about half of the area 10 shootings involved cannabis or drugs. Eighty percent of repeat suspects were involved in incidents occurring in area 10.

Rest of Carbondale. In the rest of Carbondale, there is no clear pattern, rather a little bit of everything.

Situational Circumstances for Confirmed Shootings

Area 1
- People involved knew each other: 36%
- Shooting outside of residence: 32%
- Fight/dispute related: 31%
- Party-related: 27%
- Involved drugs/cannabis: 23%
- Accidental / reckless discharge: 21%
- People shooting at each other: 20%
- Unknown circumstances: 18%
- Shot from a vehicle: 16%

Area 6
- People involved knew each other: 11%
- Shooting outside of residence: 37%
- Fight/dispute related: 12%
- Party-related: 18%
- Involved drugs/cannabis: 15%
- Accidental / reckless discharge: 7%
- People shooting at each other: 20%
- Unknown circumstances: 18%
- Shot from a vehicle: 35%

Area 7
- People involved knew each other: 11%
- Shooting outside of residence: 0%
- Fight/dispute related: 8%
- Party-related: 36%
- Involved drugs/cannabis: 15%
- Accidental / reckless discharge: 2%
- People shooting at each other: 0%
- Unknown circumstances: 27%
- Shot from a vehicle: 2%

Area 10
- People involved knew each other: 31%
- Shooting outside of residence: 26%
- Fight/dispute related: 38%
- Party-related: 9%
- Involved drugs/cannabis: 46%
- Accidental / reckless discharge: 37%
- People shooting at each other: 17%
- Unknown circumstances: 37%
- Shot from a vehicle: 37%

Rest of Carbondale
- People involved knew each other: 11%
- Shooting outside of residence: 5%
- Fight/dispute related: 12%
- Party-related: 9%
- Involved drugs/cannabis: 0%
- Accidental / reckless discharge: 10%
- People shooting at each other: 13%
- Unknown circumstances: 11%
- Shot from a vehicle: 10%

Legend:
- People involved knew each other
- Shooting outside of residence
- Fight/dispute related
- Party-related
- Involved drugs/cannabis
- Accidental / reckless discharge
- People shooting at each other
- Unknown circumstances
- Shot from a vehicle

*Specific incidents may involve more than one of the situational circumstances described.

Figure 10: Situational Circumstances for Confirmed Shootings, By Study Area

We also studied the perceived triggers, causes or initiating circumstances for each shooting. Most shootings had unknown/undetected causes (n=83), according to the police reports, but of the remaining shootings, most that could be determined to have a triggering event or cause were dispute related (n=41). Table 6 provides a breakdown of the triggers/causes for incidents and how they are distributed across the areas. Areas 1 and 10 are where a substantive portion of incidents triggered by disputes, retaliation or disrespect and careless discharge of guns occur. Area 6 is somewhat similar but claims a much higher percentage of incidents stemming from retaliation or disrespect and none that were attributed to accidental or careless discharge. In terms of triggers or causes, area 7 best aligns with the rest of Carbondale.

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Table 6: Triggers, Causes, or Irritating Circumstances for Shootings by Area

Reason*	Area 1	Area 6	Area 7	Area 10	Rest of Carbondale	Citywide
Unknown	16%	31%	11%	34%	8%	83
Dispute	27%	17%	15%	29%	12%	41
Retaliation/disrespect/ minor offense	25%	37.5%	0%	25%	12.5%	8
Accidental / careless	25%	0%	12.5%	25%	37.5%	8
Group/gang	50%	50%	0%	0%	0%	2
Robbery	50%	0%	50%	0%	0%	2

*Shootings can have more than one cause.

We asked residents from the different areas to identify the extent that circumstances such as these are driving, motivating, or causing gun violence in the area where they live. See figure 11. In many cases, residents from the area appeared to have an accurate impression, based on our review of confirmed shootings. Among the most gun-violence prone areas, they blamed revenge/retaliation, criminally active groups, fights at parties, and shootings from cars. There were only a few differences in how residents responded. Area 6 stands out in that 49% of residents say fights at parties are driving most incidents, along with 41% who attribute the gun violence to shooting from cars. These proportions are higher than the other areas and consistent with the analysis of confirmed shooting situational circumstances in area 6 (See figure 10). Also, 19% of area 6 residents blame robberies as a major contributor to gun violence, yet none of the confirmed shootings in are 6 over a 2.5-year period appeared to police to be robbery-motivated.
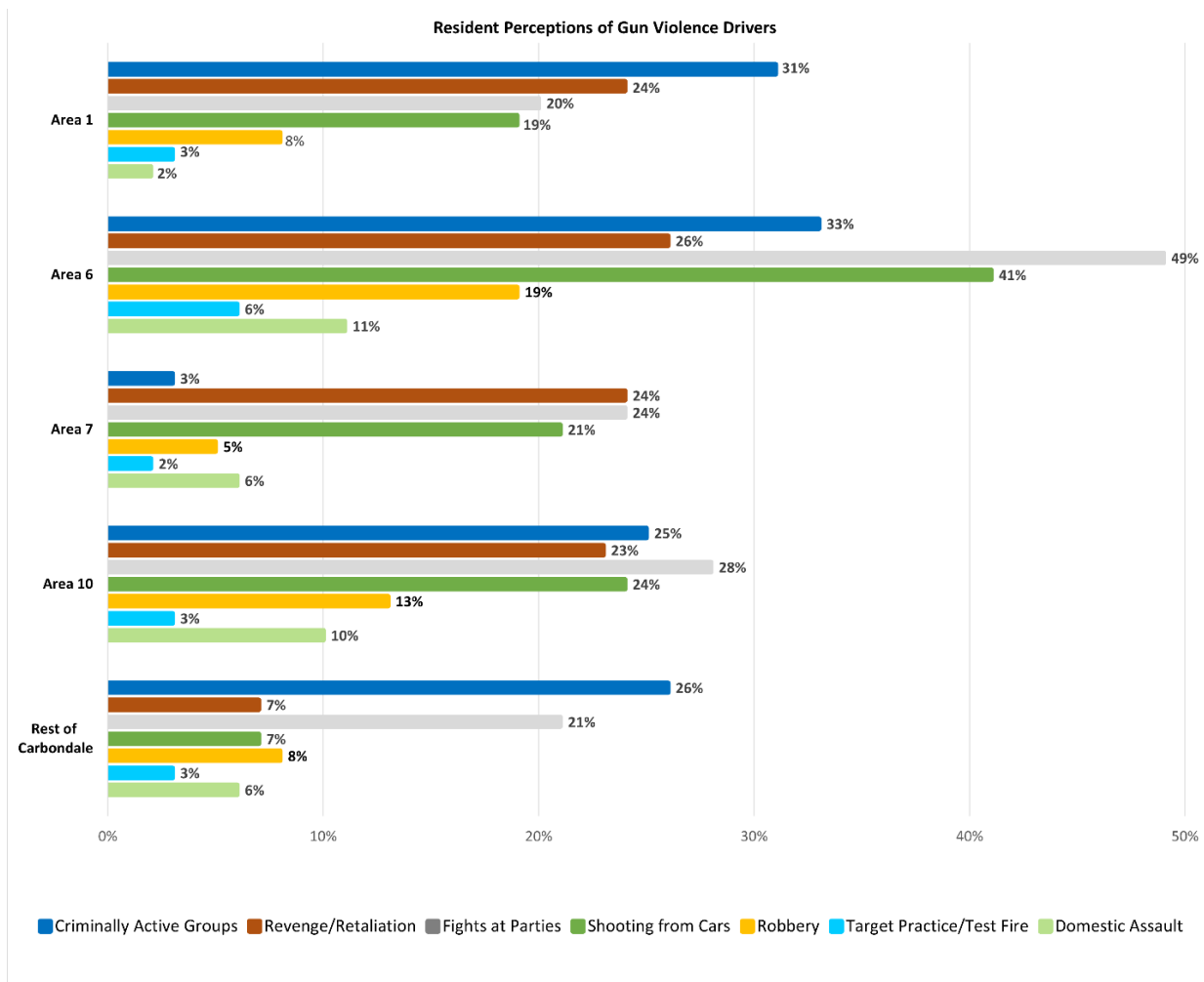
Resident Perceptions of Gun Violence Drivers

	Criminally Active Groups	Revenge/Retaliation	Fights at Parties	Shooting from Cars	Robbery	Target Practice/Test Fire	Domestic Assault
Area 1	31%	24%	20%	19%	8%	3%	2%
Area 6	33%	26%	49%	41%	19%	6%	11%
Area 7	3%	24%	24%	21%	5%	2%	6%
Area 10	25%	23%	28%	24%	13%	3%	10%
Rest of Carbondale	26%	7%	21%	7%	8%	3%	6%

Figure 11. Resident's Perceptions of Gun Violence Drivers by Study Area

A number of these circumstances are perceived to facilitate shootings because would-be shooters have ready access to guns, according to key stakeholders and to residents. Figure 12 shows, by area, the degree to which residents believe it is common for people to carry guns in the area where they live. Almost half of residents in area 6 claim it is very common for people to carry guns there. Area 10 residents also report a particularly high prevalence of gun carrying. Notably, one-quarter of residents in areas 1, 6 and 10 think that most gun carriers in the area are primarily using guns to commit crime. Area 6 residents also expect that many people carrying guns in the area are motivated by a need for respect.
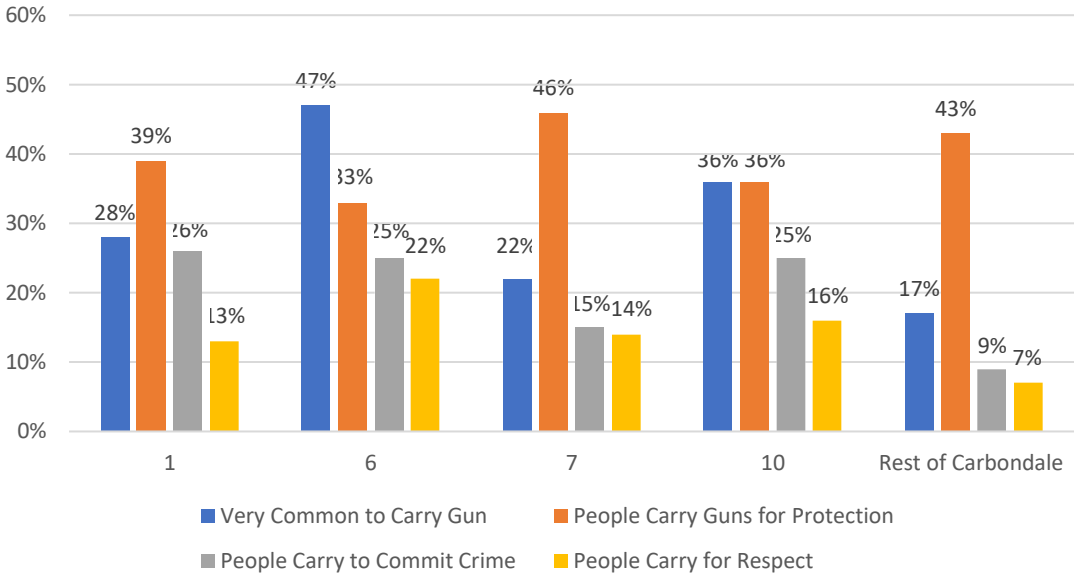
20

Figure 12: Residents Perceptions about Gun Carrying in the Area Where they Live

Driving Gun Violence in Hot Spots

Crime, including gun crimes tend to concentrate in micro areas, smaller areas than the geographic study areas. So, we asked residents to identify specific places, locations, corners, or streets in their areas where gun violence is most likely to occur; 472 residents named at least one specific problem area. The seven places that at least 20 residents highlighted as the most prone to gun violence include Cherry Street, Oakland Avenue—especially around Oakland and Sycamore—West Sycamore, College Street, Poplar Street, Walnut Street, and Wall Street. These hot spots are located in study areas 1 (Cherry St, College St, S. Oakland Ave, S. Poplar), 7 (N. Oakland Ave, W. Sycamore St, N. Poplar), 6 (N. Wall Street, near Attucks Park), and 4 (W. Walnut St). Some of these hot spot locations were also raised during interviews with key stakeholders, who also mentioned Cherry St and the Attucks Park area.

Figure 13 demonstrates, by hot spot, the top reasons residents reported for gun violence happening at each specific location. Residents largely blamed rental issues, house parties, gang activity/influence, poverty, drug activity, and a high volume of vehicle and foot traffic for the gun violence problem in the hot spots. The reasons that residents provided for why these areas suffer from elevated levels of gun violence problems aligned with what key stakeholders raised as the reasons for many of the gun violence problems across the city. Of note is that more than other areas of Carbondale, a substantial number of the hotspots in area 1 are believed by residents to be facilitated by house parties and to a lesser extent group or gang issues. This too was echoed by key stakeholders who specifically talked about the Cherry Street area being a problem area due to large parties that result in conflict between party attendees or between members of groups.
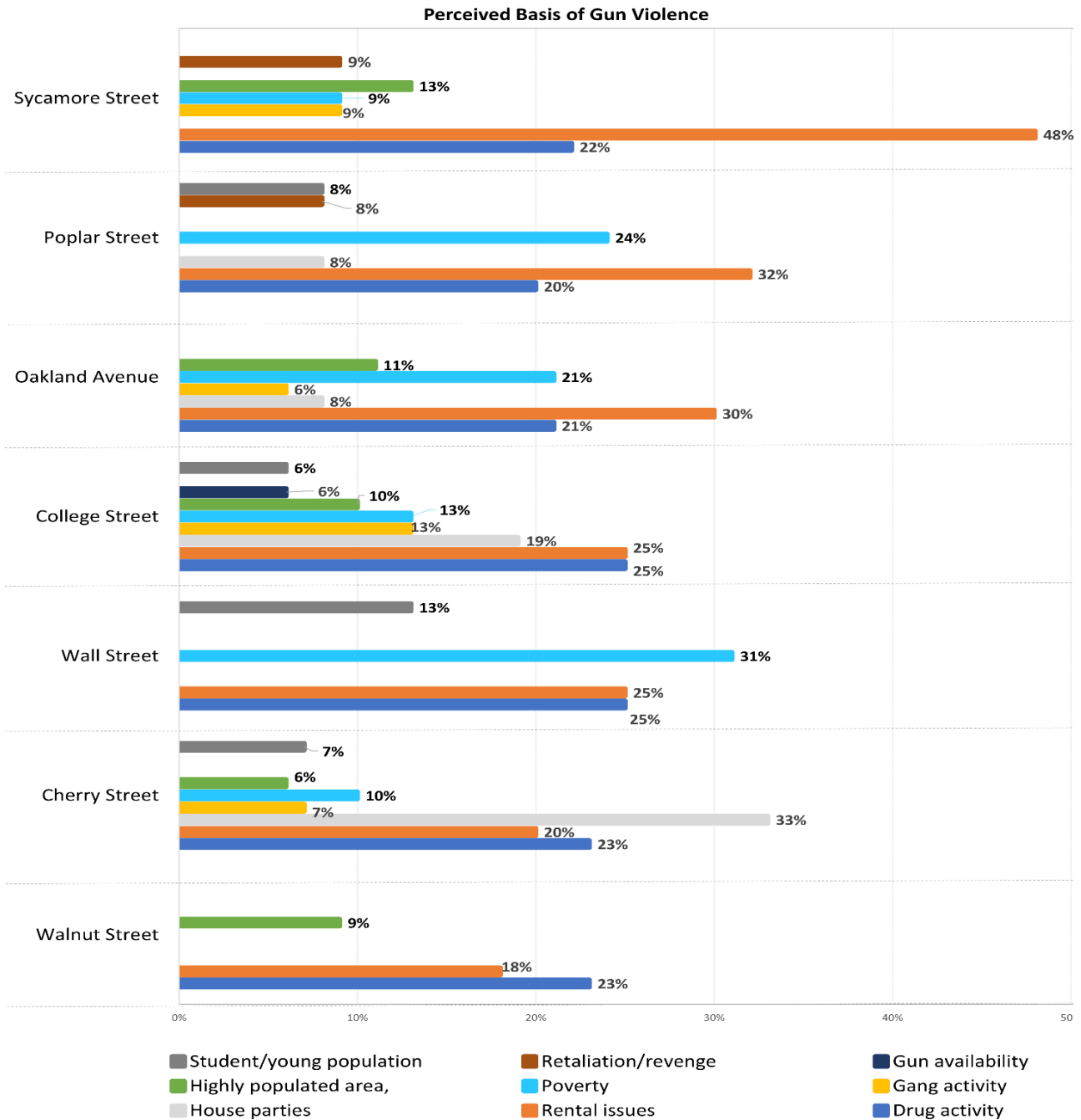
Perceived Basis of Gun Violence

Figure 13: Proportion of Perceived Basis of Gun Violence

A hot spot area raised by key stakeholders that was not as frequently mentioned by residents is the Fields Apartment complex on Lewis Lane in area 10 (This is the location of the most recent gun homicide on October 3, 2022). The Fields and nearby vicinity on Lewis Lane was mentioned by 15 residents as a problem location, with the primary basis offered being drugs. Between 2019 through 2021, we observed an average arrest rate of just under one gun arrest each month. Only 3 of the arrestees were believed to live at the Fields.

Suspects and Arrestees

Arrestees differed somewhat by geographic area. Individuals arrested for an incident in area 1 were older than individuals arrested for incidents in all other areas (31 years old on average), and significantly older than individuals arrested for incidents in area 10 (26 years old on average). Interestingly, this does not align with resident perceptions. A plurality or majority of residents across areas report that the age group most involved in perpetrating gun violence in their area is 18 to 25 years. This does approximately align with the median age of individuals arrested for gun-related offenses, which ranges from 24 (area 7 and area 10) to 26 (area 1 and area 6). Another difference across areas in arrests was that individuals arrested for an incident in area 6, area 7, or an area with low levels of gun violence were more likely to be Carbondale residents (80%, 78%, and 80%, respectively), while individuals arrested for an incident in area 10 were less likely to be Carbondale residents (63%). There were no significant differences across areas in terms of race, sex, or illegal gun possession offenses.

Juveniles compose a small proportion of arrests (12%). Nevertheless, residents of areas 1, 6, 7, and 10 are somewhat more likely than residents of other areas to report that some or most high-school aged males carry a gun; they are also more likely to report that high-school aged males in their area belong to a gang and are much more likely to say that they are somewhat or very concerned that youth in their area are at risk of belonging to a gang. Concerns related to teen gang-involvement are highest in area 10. See figure 14.
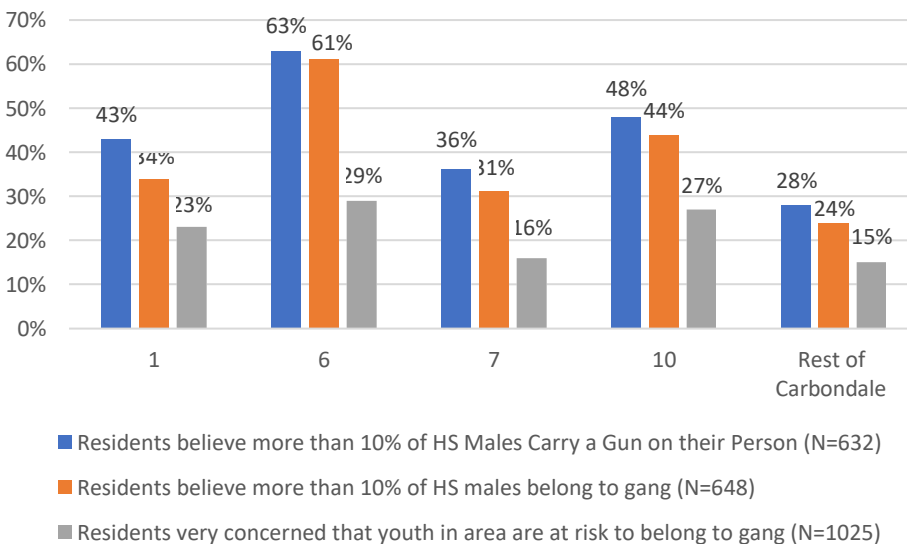

Figure 14: Concerns about Youth Involvement with Guns or Gangs by Area

Figure 15 provides the proportion of the repeat suspects from January 2020 through July 2022 who were suspected of being involved in incidents in each area. Area 10 is heavily engaged by most of the repeat suspects, as are areas 1 and 6, but to a lesser extent. Rarely are these repeat suspects involved in incidents in the rest of Carbondale.
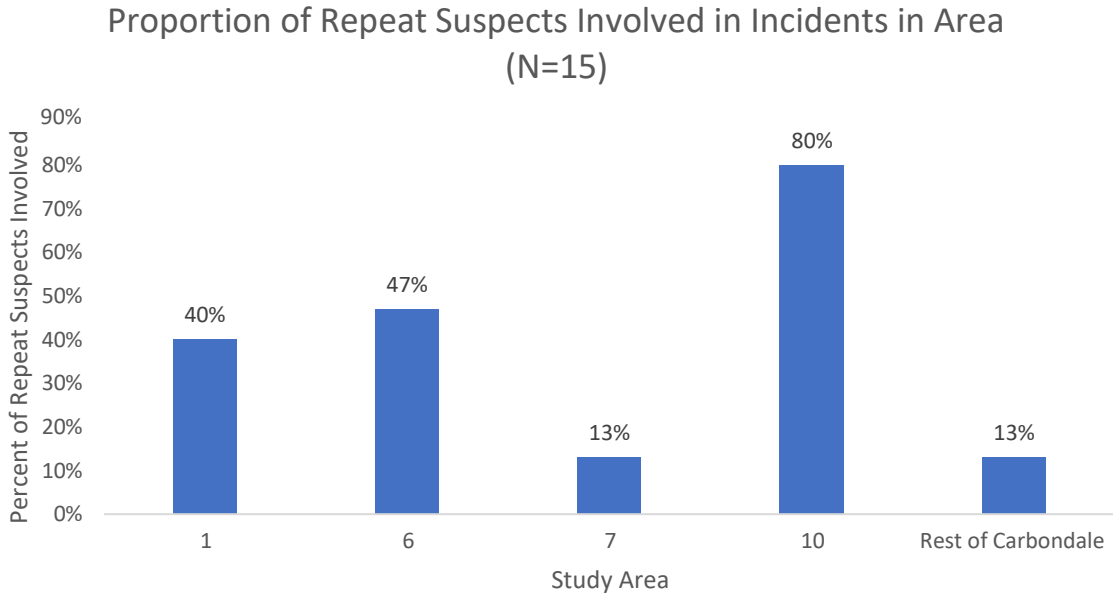
Proportion of Repeat Suspects Involved in Incidents in Area
(N=15)

Figure 15: Repeat Suspects' Engagement in Incidents by Area

Harm from Gun Violence

As mentioned, many harmful impacts of gun violence can be difficult to measure. They include feeling unsafe, suffering from ancillary or co-occurring crime problems, and other concerns that negatively reflect community wellbeing. A comparison of residents' feelings of safety and concerns about guns, gangs and drugs by area shows that the high gun violence impact areas do experience harm from their elevated levels of gun violence.

As shown in Figure 16, although a majority of residents who responded from areas 1 (72%), 6 (52%), 7 (80%), and 10 (80%) indicate that they feel safe while walking alone in in their neighborhood during the day, this compares to 90% in the rest of Carbondale. Likewise, residents in greater Carbondale feel safer at night than residents living in the focal areas. Area 6 residents feel particularly unsafe relative to all other areas of Carbondale.
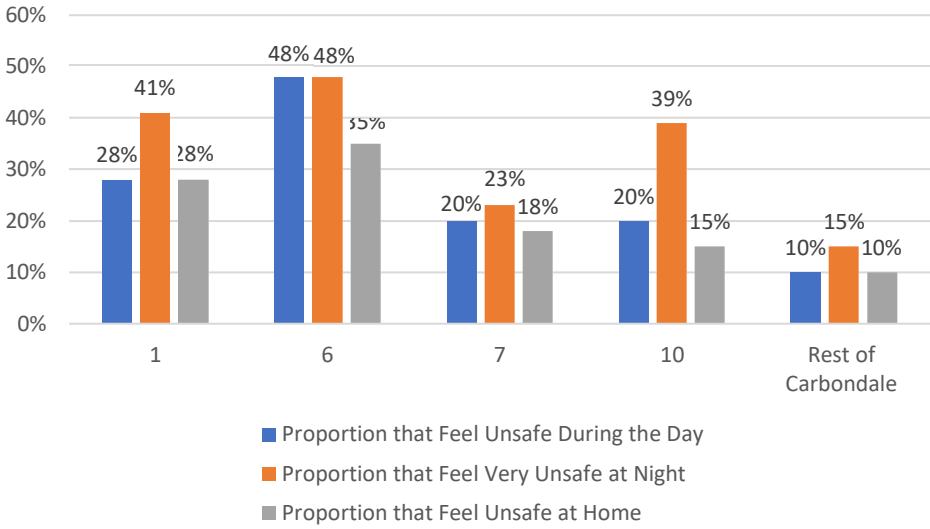
Figure 16: Feeling Unsafe

Residents of the high gun violence impact areas also experience ancillary problems at a greater frequency / level than the rest of Carbondale. Roughly 30% of residents within areas 1, 6 and 10 see drug sales daily in their area. More than one in five residents of areas 6 and 10 see gang activity at least weekly, and roughly one-quarter of residents in areas 1, 6, and 10 are very concerned that youth in the area at risk for gang-involvement. Almost one-third of residents in area 6 experienced victimization during the last year. Among those victims, 25% reported experiencing violent victimization.
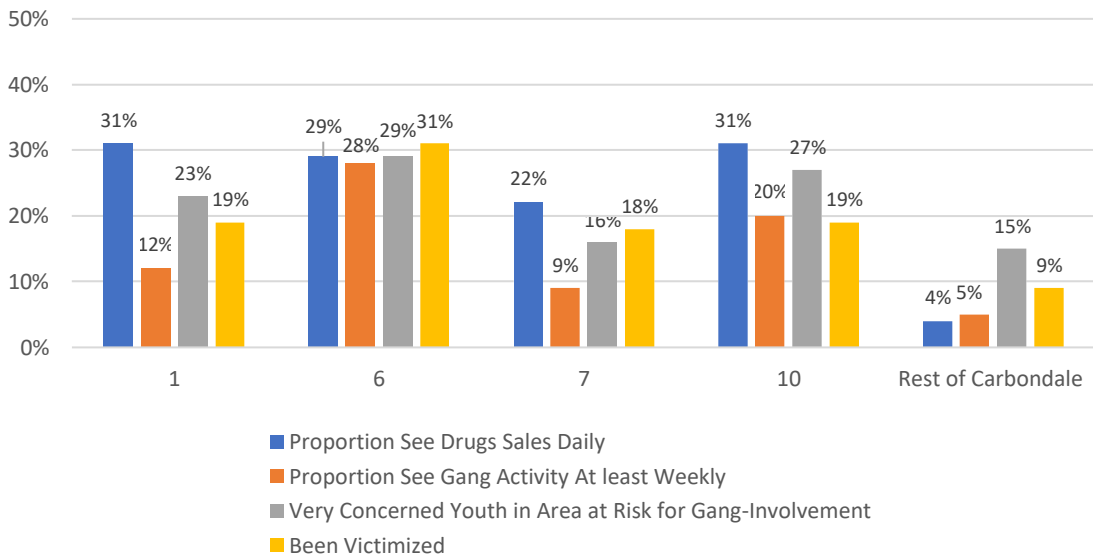

Figure 17: Experiencing Ancillary Crime Problems by Area

Summary of Gun Violence in the High Gun Violence Impact Areas

This section aims to holistically integrate the information by area for the areas most impacted by gun violence. The purpose is to gain perspective for the differences by area to assist in pursuing prevention and intervention strategies tailored to the problems.

Area 1

Area 1, which contains parts of downtown and the area described locally as the Arbor district, has not consistently been an area with high levels of gun violence. Gun violence is emerging and increasing in that area, both in terms of the number of shots fired calls and proportion of calls citywide that happen in area 1. From mid-2020 through March 31, 2022 area 1 developed a density of shots fired calls for service equivalent to 115-159 calls per .5 square mile area. Despite being a small geographic area (0.34 square miles) with about 10.5% of the city's residential households, it accounts for 15% of the city's shots fired calls for service, 16% of other gun-related calls for service, 21% of confirmed shootings, and 17% of all gun-related arrests. In other words, it accounts for a disproportionate share of the gun violence problem.

Approximately half of area 1's residents that answered the community survey reported being impacted personally by gun violence and 44% claimed that gun violence is a major problem in area 1, compared to 12% citywide, 30% in area 10, and 23% in area 7. Only area 6 rivaled area 1 residents in the severity at which they rated the gun violence problem where they live. In area 6, 54% of residents reported that gun violence is a major problem.

Residents identified several specific locations within area 1 that they perceive as prone to gun violence—many more residents identified hot spots in area 1 than in any other study area. Cherry Street area received the highest number of respondents (n=75) identifying it as a gun violence prone area. Also, in area 1, more than in hot spots located in other areas, residents pointed to house parties, having a young or student population, and to a lesser extent, group/gang related problems as the basis of gun violence. This fits the narrative of key stakeholders that described that in this area, students host parties that draw a large crowd of non-college students who may not even know the party hosts. Then, when a large crowd of people, who may not know each other, are together in one place and drinking, conflicts arise over minor forms of disrespect, or individuals come together (unwittingly) who already had a conflict with others who also attend the party. Because individuals come to parties armed with guns, the conflicts can transition to a shooting.

Not inconsistent with this impression, the circumstances recorded in police reports for confirmed shootings in area 1 relative to other areas of Carbondale suggest that many shootings are happening outside of a residence (e.g., versus a drive by shooting or from an unknown location) (32%), a fight or dispute preceded the shooting (31%), and in fact, 27% of incidents were identified by responding officers in their report as party-related. Among shootings in area 1, more so than in other areas, except area 10, shooters involved in an incident were believed to know each other (36%). About one in four incidents in area 1 involved cannabis or another type of drug.

Across the confirmed shootings citywide, 27% of the incidents believed to be derived from disputes occurred in area 1, 25% of confirmed shootings arising from retaliation or disrespect occurred in area 1, half of shootings believed to be gang/group causes occurred in area 1, and 25% of confirmed shootings that stem from careless gunfire or accidental gunfire happened in area 1.

Individuals arrested for an incident in area 1, who were 31 years old on average, were older than individuals arrested for incidents in all other areas. They were significantly older than individuals arrested for incidents in area 10, who were 26 years old on average.

Strategies addressing gun violence in area 1 would want to deal with parties as a crime attractor, bringing potential offenders and victims together at a place that lacks sufficient capable guardianship and where provocations such as alcohol and high numbers of people come together. Another angle for prevention is to focus on disputes and drugs as well as fear of gun violence among residents. Addressing group conflict is also a potential approach.

Area 6

Although there are some indicators that gun violence is declining slightly in area 6, perhaps shifting to area 1, area 6 persists as a high gun violence area. Like area 1, it is a small geographic area (0.28 square miles) and accounts for only a small fraction of the city's residential households (6.7%). Nevertheless, it accounts for 26% of shots fired calls for service, 18% of other gun-related calls for service, 24% of confirmed shootings, and 18% of gun-related arrests.

Apart from area 1, a plurality or majority of residents in all other areas who responded to the survey identified area 6 as having the biggest problem with gun violence. Area 6 was also the only area in which most of the residents reported being personally affected by gun violence. Furthermore, area 6 was the only area in which almost half of residents reported that they felt unsafe (22% very unsafe; 26% somewhat unsafe) walking alone in their area *during the day*. Similarly, residents of area 6 were twice as likely as residents of other areas to report that they felt very unsafe *in their home*. The lack of perceived safety might not only be due to a high rate of personal experience with gun violence, but also due to a high rate of other types of victimization, as well as frequently seeing crime and gang activity. A larger share of residents of area 6 reported seeing the police, people buying/selling drugs, and gang activity daily compared to other areas, and almost 1 in 3 residents reported being a victim of a crime in the past year. In this area, a majority (61%) of residents estimated that more than 10% of teenage males carry guns.

Area 6 experienced a large proportion of shots fired from vehicles or outside of residences. Yet, a relatively low proportion of incidents were known by police to be a biproduct of a fight or dispute—this may be due to lack of information provided in many of these incidents. Police reports showed that a high proportion of retaliation-motivated offenses in the city occurred in area 6 and a high proportion of repeat suspects have been involved in incidents in the area. The impression from the totality of these incidents is that a substantive number of incidents may be motivated by group/gang disputes or ongoing conflict between acquaintances.

Gun violence strategies in area 6 would want to deal with drive-by shootings, group/gang conflict/disputes, gangs, drugs, youth involvement with guns, general victimization, and residents' fear of crime and violence. Also, residents' assessments suggest adopting a hot spot and/or problem-solving approach to investigate and deal with gun violence along Wall Street in the vicinity of Attucks Park.

Area 7

Similar to area 1, area 7 may be an emerging area of gun violence. In contrast to area 1, however, evidence is mixed. Compared to other high gun violence areas, area 7 is a larger geographic area (2.39

square miles) and accounts for a sizable share of residential households (16.5%). It accounts for 14% of shots fired calls for service, 13% of other gun-related calls for service, 12% of confirmed shootings, and 13% of gun-related arrests. While it can be considered a crime-prone area, data suggest gun violence is less of a problem in area 7 compared to the other focal areas, though that could change over time.

About 35% of residents in area 7 reporting being personally affected by gun violence, which is a higher proportion compared to non-high crime areas, but a lower proportion compared to the other high gun violence impact areas. Similarly, most residents see gun violence as a moderate or major problem in their area, but the proportion is only higher than the proportion in non-hot spot areas does not align with the other focal areas (1 6, and 10). Yet, residents identified three gun violence problem locations in area 7 (N. Oakland Ave, W. Sycamore St, N. Poplar), which may be what is driving their perceptions that the area has gun violence problems.

In terms of confirmed shootings, area 7 stood out relative to the remaining higher gun violence problem areas in that the circumstances were party-related. However, many incidents in this area had unknown circumstances. Among confirmed shootings in which triggers/causes could be identified, area 7 was unique in that none of them were tied to retaliation. Also, repeat suspects were not commonly engaged in incidents in area 7. Arrestees are, on average, somewhat younger. Perceptions among residents of youth risk of gang-involvement are lower here as is perceived gun carrying among teens.

Gun violence strategies in area 7 might focus on residents' identified hot spots and parties as a basis of gun violence.

Area 10

Area 10 appears to account for the plurality of gun violence in Carbondale, and indicators of a slight decrease over time notwithstanding, it's largely remained a persistent area of gun violence. Like area 7 and unlike area 1 and 6, it is a relatively large geographic area (1.42 square miles) and accounts for a sizable share of residential households (16.2%). It accounts for 28% of shots fired calls for service, 42% of other gun-related calls for service, 32% of confirmed shootings, and 42% of gun-related arrests. This is the area most engaged by repeat suspects for shots fired.

Despite accounting for the largest share of gun violence, residents in area 10 who responded to the survey did not identify their area as having the biggest problem with gun violence. In many ways, their responses were similar to residents of area 7. For example, the proportion of residents who indicated gun violence was a moderate or major problem was similar in area 7 and area 10, and area 10 residents were only slightly more likely to report being personally affected by gun violence compared to residents in area 7. However, like areas 1 and 6, area 10 residents reported that crime was the 2nd most frequent reason for gun ownership, and a sizable proportion of residents in both area 6 and 10 reported seeing people buying and selling drugs daily.

Area 10 experienced a higher proportion of shots from vehicles and outside of residences and incidents involving people who knew each other. A high proportion of incidents in this area were clearly fight or dispute related. There were also a substantial number of accidental or reckless gun use incidents in area 10. Notably, about half of the area 10 shootings involved cannabis or drugs. Concerns about gangs are highest in area 10 and it is in this area that the majority of arrestees are not from Carbondale.

Although residents did not feel as strongly as key stakeholders that they could identify a major problem location within area 10, plotting calls for police service suggests that gun violence concentrates in the area equivalent to about 77 to 114 calls for shots fired per .5 square mile area.

Gun violence strategies applied in area 10 should address drugs, gang/group conflict, drive-by shootings, and repeat gun suspects.

Support for Prevention and Intervention

It is not surprising, given the high degree of concern and personal experiences with gun violence in the focal areas that a majority of residents in these areas say that they would be extremely supportive of strategies to address gun violence where they live. Residents in the rest of Carbondale, while experiencing lower levels of gun violence and less direct harm also are similarly supportive. See figure 18.
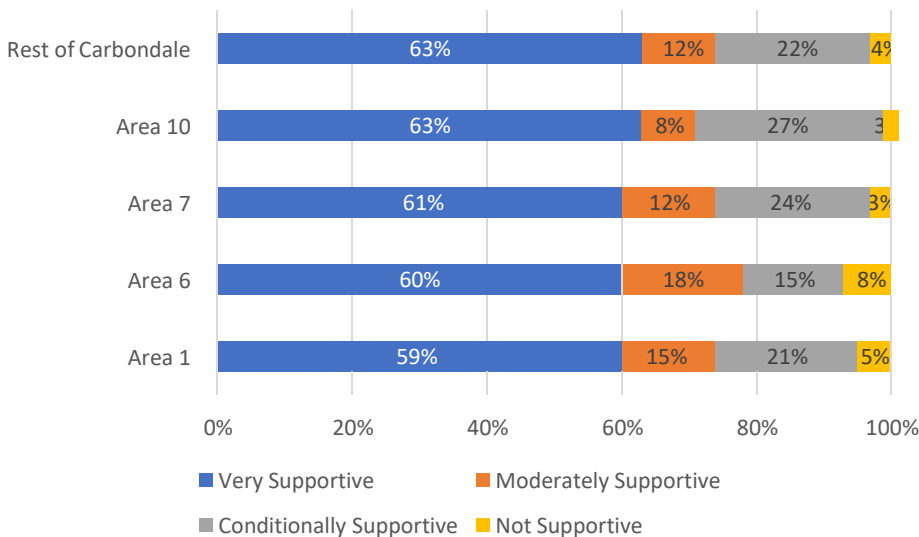

	Very Supportive	Moderately Supportive	Conditionally Supportive	Not Supportive
Rest of Carbondale	63%	12%	22%	4%
Area 10	63%	8%	27%	3
Area 7	61%	12%	24%	3%
Area 6	60%	18%	15%	8%
Area 1	59%	15%	21%	5%

Figure 18: Support for Evidence-Based Strategies to Address Gun Violence

Strategies that are currently ongoing, according to residents, predominantly take the form of police presence, afterschool activities for youth, and summer activities for youth. Small portions of residents (fewer than 10% in each area) mentioned mentorship initiatives and fewer still mentioned things such as gang suppression activities, mediation, and public education campaigns. In each area, including outside the high gun violence impact areas, about 18 to 28% of residents think that no strategies are in place to try to reduce gun violence.

Potential Strategies for Prevention and Reducing Gun Violence in Carbondale

As mentioned, the more tailored the solution to crime problems to the places and people involved, the more likely to be effective at reducing the problem (Skogan & Frydl, 2004; Webster, 2022). Our report shows that there are a number of different gun violence problems occurring in Carbondale, thus calling for a diversity of solutions (see also John Jay College Research Advisory Group on Preventing and Reducing Violence (2020). Below, we briefly outline the evidence base for existing programs and

strategies that could be applied to prevent and reduce the types of gun violence issues happening in Carbondale. We focus on prevention approaches meant to have an immediate impact on the violence. However, we also touch upon long-term strategies.

Conflict Mediation and Restorative Justice

Given that many gun violence incidents in Carbondale stem from interpersonal conflict, programs tailored toward conflict resolution may be beneficial. Interview and focus group participants and even residents agree that disputes at parties and other large gatherings are responsible for a substantial amount of gun violence in Carbondale. The perception that parties are hubs for gun violence is consistent with the ideas that gun violence happens outside, at night, on weekends, and with younger groups of individuals. Indeed, in general, disputes, rivalries and conflict appear to be a major factor in the gun violence in Carbondale.

There are several different types of conflict resolution programs (e.g., restorative justice, Cure Violence), but a main component is that they involve conferences between people involved in conflict and sometimes also friends, family, or other community members, typically with a mediator.

A recent example is the St. Louis Metropolitan Area Gun Violence De-Escalation Centers, implemented by Better Family Life, a not-for-profit community development corporation. The primary goal of these centers was to prevent gun violence. In short, when a conflict is identified, a team of specialists, such as therapists and case managers, engage with adversaries to participate in conflict resolution and provide support services (Brown School Evaluation Center, 2020). In the case of the de-escalation centers, an initial commitment to abstain from violence occurs prior to mediation. Evidence of the effectiveness of such programs is mixed (e.g., Harmon-Darrow, 2022), and there are a number of barriers and limitations to implementing them. For instance, a necessary condition is that people must be willing to engage in the process.

Cure Violence tackles gun violence as a similitude of a communicable disease which can be transmitted if not cured (Butts et al., 2015). Cure violence attempts to tackle violence by directly halting the transmission of violent behavior, modifying the reasoning of potential transmitters of violent behavior, and altering the collective norms regarding violence (Butts et al., 2015). It aims to interrupt and de-escalate street conflict by using "relatable" street violence interrupters and outreach workers in combination with public education campaigns and community organizing meant to reach historically marginalized populations and provide systems of support to redirect unhealthy life trajectories and alter community norms related to violence. Cure Violence strategies most often involve high-risk youth. The cure violence-modeled intervention implemented in Baltimore, MD produced mixed results with some intervention sites experiencing significant reductions in homicides and non-fatal shootings while some sites did not show comparable results (Buggs et al., 2022; Webster et al., 2012). However, the results of the cure violence model in NYC between 2010 and 2013 showed that the implementation was associated with an 18% decline in the homicide rate (Butts et al., 2015). Other studies supporting its effectiveness were conducted in Philadelphia (Roman et al, 2017) and in Trinidad and Tobago (Maguire et al., 2018). Overall, it has been effective in some places, but not others, but generally appears promising. In places where there was a higher frequency of interruptions it has been more effective (Harmon-Darrow, 2022).

Advance Peace aims to be trauma-informed and adopts the view that "hurt people, hurt people." They try to recruit the most violent individuals involved in elevating the risk of gun violence in the community.

Clients create a Life Management Action Plan (LifeMAP) with the help of a street outreach mentor. The program integrates life skills classes, substance use treatment and other social services, group therapy that directly discusses topics like systemic racism, and group excursions outside of the city to do things like community service projects, college visits, etc. Mentors frequently engage with participants (In Sacramento, the average was 18 times per month for 12 hours per month). When the participant makes substantive progress on the LifeMAP, they are rewarded with a financial allowance as incentive to stay the course. An evaluation of program implementation in Sacramento, California reported that a majority of participants completed the 18-month program, 90% had no new gun charges, only one person was shot or killed, and gun homicides and assaults declined (Corburn & Fukutome-Lopez, 2020).

Restorative justice practices bring together an offender and those impacted by the offense to discuss what happened and its impact with a goal of repairing the harm caused. Studies have found that restorative justice conferences can reduce repeat offending and rearrest, including for violence (Harmon-Darrow, 2022; Sherman et al., 2015).

Nationally, conflict mediation is considered a promising strategy to address gun violence because it has had some impacts on shootings, killings and retaliatory homicides. Potential additional benefits may be to increase community engagement, change perceptions of conflict, bolster problem solving skills, and decrease the risk of criminal justice involvement.

Focused Deterrence Initiatives to Address Repeat Offenders

Nearly one-quarter of the shootings in Carbondale stem from a small number of repeat gun offenders who shoot at one another and often in groups. These incidents are likely motivated by group conflicts. Individuals who have a prior weapons conviction and/or who have been shot at are likely to be carrying a gun and reoffend (Sevigny & Allen, 2015). Apart from prosecution and punishment leading to incapacitation, an effective solution for these types of problems entails intervention in the form of Focused Deterrence.

Focused deterrence strategies, also called pulling levers and implemented under the Project Safe Neighborhoods federal grant initiative in many cases, concentrates criminal justice and social service agency resources on a small number of identified shooters, generally gang or group-involved shooters (This strategy has also been effectively applied to drug markets (Corsaro, 2013)). Focused deterrence brings intense focus on repeat offenders. Identified repeat offenders (shooters) come together for a meeting (call-in) whereby families of gun violence victims explain how they have been impacted by gun violence, former shooters who have since reformed implore the shooters to remove themselves from gang-life and gun violence involvement, social service providers offer their services to assist the repeat offenders to discontinue their current crime-involved lifestyle and instead pursue education, jobs, and productive involvement in community, and criminal justice practitioners such as police executives, prosecutors, probation officers, and parole officers, outline the levers that they will pull to increase penalties should the shooters continue to shoot (Reichert et al, 2018). Focused deterrence can also integrate cure violence models that focus on disrupting ongoing street conflicts (Braga, 2008).

Existing evidence shows that focused deterrence interventions are effective and have recorded success in mitigating the spread and continuation of gun violence (Braga, Weisburd, & Turchan, 2018), including on officially recorded gun violence outcomes and on residents' experiences with gun violence (Kochel, Nouri, & Samadi, 2022). The intervention has previously been implemented in places such as Boston, MA (Operation Ceasefire), Chicago, IL (Chicago-Ceasefire), Phoenix, AR (the TRUCE), Brooklyn, NY (Save

Our Streets), Pittsburgh, PA (One Vision One Life), and Baltimore, MD (Safe Streets) among others. Evidence strongly supports that the intervention has resulted in significant reductions in gun-related gang/youth violence and homicide (Braga et al., 2001; Kennedy et al., 2001). For example, Chicago-Ceasefire successfully reduced gun violence in more than 70% of the sites where it was implemented. Thus, in Carbondale, efforts to apply focused deterrence to disrupt conflict and gang or group-related retaliatory shootings may provide a promising approach.

Addressing Shootings from Vehicles

A substantial number of shootings in Carbondale were described as shootings from vehicles, especially in area 6 and to some extent in area 10. This is notable in that drive-by shootings typically are much less prevalent than other types of shooting incidents. Shootings from cars generally are motivated by disputes between acquaintances (e.g., spontaneous argument), rivalries between gangs/groups, disputes over drugs, or extreme road rage. Attacks are frequently followed by reprisals and further counterattacks. For these types of incidents, police generally receive little information from witnesses (Dedel, 2007), and that appears to also be the case in Carbondale.

To conduct a drive-by shooting, perpetrators need a gun and a vehicle and a location conducive to quick entry and exit. Frequently traveled streets by offenders are at greatest risk. Area 6 has an area of grid-like streets, which would facilitate the ease of individuals driving in and out of the area quickly. Changing traffic flow to reduce mobility by creating speed humps, removing throughways by adding barriers or cul-de-sacs, or strategically altering the streets to one way to reduce the ease with which would-be shooters can move in and out of the area is one approach to reducing drive by shootings or increasing the risk that drive-by shooters get caught. This can also entail fencing and gating apartment complexes. However, if drive-by shooters themselves live in the area where they are offending, this may not be an effective strategy. Also, the benefits of changing traffic flow or street closures are important to consider relative to residents' daily activities and needs of first responders to access the area.

Few studies have evaluated street closures to address drive-by shootings and most of the studies were conducted in the 1990s. Generally, published studies show promise. Los Angeles applied this approach for 14 streets by erecting barriers to block major roads into a neighborhood and then supplemented the approach with high visibility foot and bicycle patrols and reported an immediate reduction in homicides and drive-by shootings (Lasley, 1998). It was essential in the Los Angeles project that the community was engaged throughout the project to gain their buy in and support. Adopting a defensible space perspective, in Dayton, Ohio, a residents' association was engaged in helping to plan the project and residents voted to approve it. It was within a 10-square block residential area with major community arteries nearby that led to cut-through traffic. They closed 35 streets and 26 alleys, which created mini-areas. Violent crime declined by 40% (Donnelly & Kimble, 1997). In Hartford, Connecticut a public housing project placed a physical barrier across one street, creating two dead end streets. Consequently, violent crime decreased by 33% on the street during the next 15 months studied. Nearby streets also experienced declines in violent crime by 30 to 50%. However, the approach exacerbated drug offenses on nearby streets within the public housing area (Zavoski et al., 1999). Street closures have also been applied to address drugs and street prostitution.

Housing Improvement / Greening / Demolishing Vacant Buildings

The areas with the highest levels of gun violence (1, 6, and 10) are densely populated residential areas whereby residents and key stakeholders report housing problems (i.e., vacancies, residential turnover,

unmaintained properties, poor tenant screening and poor management practices). In general, areas with high levels of rentals, high vacancy rates, and high disadvantage struggle with collective efficacy and with guardianship. In other words, in places where people move in and out, where they don't feel a sense of ownership and commitment, and where they don't know one another, but rather feel anonymous, people are less likely to come together and form social norms for behavior and enforce those norms, and they are less inclined to engage in informal social control behaviors to address noncriminal violations of social order. In such spaces, crime and disorder problems are higher. Initiatives that could help with these circumstances focus on addressing the housing and vacancy problems, and creating community ownership, proactive social engagement, and guardianship by increasing legitimate users of space.

Key stakeholders and community survey respondents consistently identified housing as a contributing factor to gun violence. With the decline in SIUC enrollment, fewer students need housing, and this has deteriorated the rental market in Carbondale. Fewer available tenants have led to worsened screening procedures and poor property maintenance. Rundown housing diminishes pride and a sense of ownership in the area, often resulting in minimal social interaction with neighbors. Rundown conditions can create the appearance that no one in the area cares or will take action to address problem behaviors. There is also a perception that a large concentration of vacancies can be homes for gun violence. Community survey respondents, when asked what would help to reduce gun violence in the area where they live, commented on housing suggesting things like converting blighted and vacant properties into owner occupied homes, helping people buy homes, increasing access to housing or incentivizing home ownership, putting caps on rent, and improving access to affordable housing. In addition to the importance of housing, several survey respondents note perceptions about the physical environment within their neighborhoods, cleaning up trash and funding programs like Keep Carbondale Beautiful, community gardens and nicer parks.

The importance of place as it relates to crime and violence is well researched. The built environment and housing conditions have been linked to crime and violence (MacDonald, 2015). The physical structures and the immediate surrounding of houses play significant roles in crime and violence rates at the affected places. This is one of the arguments of broken windows theory. Spelman (1993: 481) found that, "Crime rates on blocks with open abandoned buildings were twice as high as rates on matched blocks without open buildings." Scholars have found that perceptions of social disorder and observed physical disorder, including abandoned buildings, promote fear of crime (Hinkle & Wiesburd, 2008; Perkins, Meeks, & Taylor, 1992; Wallace & Schalliol, 2015). Additionally, improvement of housing conditions or addressing vacant housings spaces have been associated with reductions in violence and crime (Branas et al., 2018; Jay et al., 2019). Potential solutions include demolishing vacant houses and utilizing the land for economically beneficial engagements such as shopping areas and community gardens--where neighborhood residents can socialize (Branas et al., 2018; Jay et al., 2019) or simply improving vacant lands and lots (Branas et al., 2018; Heinze et al., 2018; Kondo et al., 2016; Kuo, 2001).

One example of focusing on vacant buildings and landscapes was implemented between 2014 and 2016 in Detroit, MI. Over 10,000 vacant buildings were demolished in a bid to address gun violence (Jay et al., 2019). A pre-post evaluation revealed that demolitions of over 5 vacant buildings in a neighborhood were associated with reductions in fatal and nonfatal firearm assaults. However, locations that received moderate amounts of demolitions (between 6 to 12) in neighborhoods were associated with a larger reduction in firearm violence compared to those receiving higher demolitions (Jay et al., 2019). These findings suggest that when vacant buildings are addressed, particularly through demolition, firearm

violence may be reduced. A similar effort in Chicago found an 86% reduction in areas where high-rise buildings were demolished (Aliprantis & Hartley, 2015).

Several studies support that efforts to remove trash and revitalize vacant lots and plant grass and trees and then monitor newly greened spaces can impact gun assaults, particularly when vacant lots were previously a place for the storage or disposal of illegal guns or spaces that accumulated abandoned vehicles and other dumped items. In Philadelphia, greening at blighted vacant lots reduced residents' concerns about going outside their homes by 58% and also reduced gun violence by 17% (Branas et al., 2018). Even merely mowing and trash cleanup reduced shootings by 9% (Moyer et al, 2019). Similar results were found in Flint, Michigan. When residents worked together to maintain vacant lots they showed a 40% reduction in assault and violent crime on those street blocks (Heinze et al., 2018).

In addition to "cleaning and greening" strategies, efforts to address dilapidation and problem properties can take the form of code enforcement and nuisance abatement efforts. Efforts primarily engage commercial property owners (e.g. bars or liquor stores), but this can also include property managers or landlords of blighted properties that generate a high volume of police or ambulance interventions. This approach utilizes the threat of potential sanctions for violating municipal ordinances/regulations (e.g., fines, license revocation) to gain compliance and cooperation from these parties to control the behaviors at a problem location or among repeatedly offending parties over whom the third party has authority or influence. This approach has even been used with parents to address offending by youth, using curfews or truancy penalties, for example, as a legal lever (Bennett et al., 2018). Evaluations have supported that such efforts to address drug and violent crime have produced desirable outcomes (Mazerrole & Ransley, 2005).

Crime prevention through environmental design strategies and intermixing housing geared toward different income levels—integrating low-income housing among middle and higher-cost housing are additional housing-based approaches to reduce crime and violence in communities (MacDonald, 2015; Newman, 1995, 1996).

Hospital-based Violence Intervention Programs (HVIPs)

One in four confirmed shootings in Carbondale from January 2020 through July 2022 involved someone being treated at the hospital. Recent calls for action have discussed the need for hospital-based violence intervention programs (Richardson & Bullock, 2021). However, among adults, HVIPs that focus on creating service plans, counseling, and providing information about the dangers of owning a firearm and safe gun storage have not resulted in significant reductions in violent injury and have a weak impact on prevention of intentional violence injuries (Affinati et al., 2016). HVIPs are more promising for juveniles and when the treatment provides a high-dosage during the first three months (Mikhail & Nemeth, 2016; Shibru et al., 2007; Smith et al., 2013). Treatment generally involves case management approaches (generally 6-8 months of engagement) to target working with victims at risk for involvement in gun violence to reduce the chance of retaliation and reinjury by using multi-faceted and culturally sensitive programming. This approach is grounded in the Health Benefits Model that aims to use the violent incident as a teachable moment to help the injured party understand the reasons behind their injury and better appreciate the risk for future violence with a goal of reducing feelings of helplessness and revenge. Victims are connected with services such as social services, healthcare, anger management, conflict resolution, family/group therapy, substance use treatment, and mental health treatment (Evans & Vega, 2018). The approach has shown positive results in Baltimore (Coope et al., 2006), with lower rates of rearrest for violence, and in Oakland, California, where youth (they were repeat victims of violence who were on probation or parole)

were less likely to be rearrested for a violent crime within six months following their hospitalization (Becker et al., 2004).

Addressing Parties as Crime Attractors

Both community survey respondents and interviewees noted that "managing parties" or events is a crucial strategy to address gun violence in Carbondale. Situational crime prevention applies opportunity reduction and is an effective tool against a variety of crime problems (Blais, 2019; Eck, 2018). It draws from environmental criminology, adopting crime pattern theory and routine activities theory which explain that interrupting the convergence of potential offenders and victims in spaces that lack capable guardianship and considering the pathways and nodes of these individuals is an effective means to reduce crime opportunity. Efforts can focus on reducing the likelihood of contact between potential victims and potential offenders, place management, and limiting provocations. Examples could include educating SIUC students and Carbondale residents to invite only individuals known to them to parties, not posting party invitations on social media, providing limited access at the party by keeping the door locked, limiting the number of people within small spaces to avoid overcrowding, and limiting the amount of alcohol available.

Gun Violence Related to Drugs

While police data offered limited information to unpack the connection between drugs and guns, residents blamed drugs as the biggest driver of gun violence (See figure 2). Relatedly, residents living in areas with the highest level of gun violence also reported seeing drug sales in their area frequently. Key stakeholders confirmed this impression. A majority of stakeholders described that drug and alcohol use (methamphetamines, heroin, cocaine) and arguments over the underground marijuana trade are two ways that drugs contribute to gun violence. An interviewee described a relationship between illicit drugs that are being sold in Carbondale and attracting individuals from surrounding towns. In area 10, the only area where the majority of gun-offense arrestees were not from Carbondale, nearly half of the confirmed shooting incidents also involved cannabis and other drugs. Drugs/cannabis were involved in at least 15% of confirmed shootings in each of the high impact areas. Gun carrying and drug trafficking tend to co-occur, and the link is strong (Allen & Lo, 2012; Docherty et al., 2019).

Drug and alcohol use have been associated with gun violence homicides (Hohl et al., 2017). Research evidence supports that adolescent homicides tend to be committed with a gun, and individuals aged 13 to 20 with a history of alcohol or drug use or whose caregiver uses are more likely to be victims of firearm homicide (Hohl et al., 2017). A study by Carter and colleagues (2017) examining conflict among individuals aged 14 to 24 years who had sought emergency room treatment for assault found that substance use occurred in about 44% of the firearm conflicts, most often marijuana, but also alcohol.

Youth and young adults (16 to 29 years) who use alcohol, marijuana or other drugs are more likely to be carrying a firearm to engage in a drug deal or crime; to discharge a firearm while with friends, to scare someone, or during a fight or when fleeing from police; to use a firearm to threaten someone; and to have a gun while under the influence of drugs/alcohol. Youth and young adults who engage in these risky firearm behaviors are likely to be victimized and to experience a violent injury. Interestingly, while marijuana does not typically cause aggressive behavior, in high school-aged individuals, marijuana users have been found to be more aggressive than alcohol users, but the highest aggression occurred when individuals used both. This may be because aggressive individuals are more inclined to use marijuana or

because individuals are from a context where both marijuana and guns are more available (Carter et al., 2020).

The drug-guns link can derive as a consequence of drug use or as a biproduct of conflicts generated by a drug market. Gun carrying tends to increase when the value of illicit drugs increases (Sevigny & Allen, 2015) and gun violence can be higher when customers are attracted to the area from longer travel distances (Johnson, 2012). This may be especially relevant in area 10.

Strategies designed to address the association between drugs and guns could focus on substance use treatment and disruption of street-level drug markets. Focused deterrence strategies addressing drug markets have been an effective approach in a number of cities—albeit it can be difficult to replicate well (Kennedy et al., 2012; Saunders et al., 2017). Some other law enforcement-led drug-market interventions can have unintended backfire effects (Werb et al., 2011). Some areas with drug sales (e.g. apartment complexes, streets, commercial establishments) may be candidates for situational crime prevention approaches—altering the built environment upon assessing security and guardianship, access, sightlines, etc. (Eck, 2018).

Initiatives Addressing Social Media's Facilitation of Gun Violence

Key stakeholders discussed that social media was a mechanism through which to quickly and widely share information about a party, but also as a medium through which disputes play out, integrating violence and guns and even threats, and sometimes revealing the geographic location of a rival in a tweet, post or snap. A culture of violence is evident in some social media posts and individuals may use social media to present a certain social identity or create a reputation of bravado or toughness, but can also be a protection strategy. Social media users brandish guns or talk about their intent to commit violence or past violent acts (Patton et al, 2019). The relationship between social media and gun violence was discussed by stakeholders as both cause and effect in Carbondale, that "art imitates life" and that art can influence behavior.

There is no evidence base to draw from and almost no initiative that we could identify that has been deployed to address social media's facilitation of gun violence. However, Patton and colleagues (2018) did affirm the possibility of using social media strategies to reduce gun violence and homicide rates. They describe using artificial intelligence to gather real-time information to help identify threatening content online. This information could then be used in combination with conflict mediation initiatives (e.g., Cure Violence). One of many challenges to dealing with social media is the speed with which user profiles and privacy settings change, tweets and posts disappear, and obtaining access (Patton et al., 2019). Addressing social media users' underlying need to protect themselves due to fear of violence and due to conflicts may be another strategy. Another idea to explore, per one interviewee, was using social media with a message countering the culture of violence made by peers or popular artists. We did not find research examining this approach.

Gun Carrying as a Risk for Gun Violence

In the highest risk areas for gun violence in Carbondale, residents perceive the gun carrying is commonplace. Residents of areas 1, 6, and 10 describe an especially high prevalence. The preponderance of residents living in these areas (68%, 85%, and 70%, respectively) think it is somewhat or very common for people in the area to carry guns, largely for protection and also to commit crime, but in some cases, to gain respect.

"Firearm carriage empowers A/YAs [adolescents and young adults] to act more aggressively in violent encounters or to enter dangerous environments they might normally avoid" (Carter et al., 2020:9). Youth and young adults who carry a firearm are more likely to experience serious injury or death from firearms, as are their peers. Substance use, mental health problems, peer delinquency, exposure to violence in the neighborhood, peers who carry guns (or when the person believes that they do), and a desire to retaliate are associated with gun carrying among youth and young adults (Carter et al., 2020). Among individuals 16-29 years in the U.S., firearms are a leading cause of death—60% of these deaths are homicides (Cunningham et al., 2018). While only a minority of youth and young adults are likely to carry guns, the risks of serious injury to themselves and their peers make placing an emphasis on this group a high priority.

Strategies should aim to reduce firearm carrying by youth and young adults, including reducing access and safe firearm storage in homes, creating prosocial connections, facilitating resilience (e.g., increasing coping skills, support by parents or others, mentorship), but also addressing the factors motivating their gun carrying, such as fear of victimization and the need for protection (Fergus & Zimmerman, 2005; Zimmerman 2013). Self-protection and revenge are common reasons young urban youth carry firearms (Carter et al., 2015).

Strategies focused on Violence Prevention/Intervention Tailored for Youth or Young Adults

In Carbondale, 16% of arrestees involved in a shots-fired or gunshot wound incident were juveniles. Interview, focus group and community survey participants overwhelmingly point to concerns about youth and young adults' involvement in gun violence and a need for investing in our community's youth and young adults. Identified need ranges from prevention strategies that can be implemented universally to specific, individualized treatment for violent youthful offenders.

A study by Carter and colleagues (2017) examining conflict among individuals aged 14 to 24 years who had sought emergency room treatment for assault found that a quarter of the conflicts involved firearms. The basis for most firearm conflicts was retaliation (51%) and 24% of incidents were triggered by arguments over personal belongings—these triggers are apparent in Carbondale gun violence. In the study, when the motivation for an assault was retaliation, the assault was five times more likely to involve a firearm. Retaliation poses a significant risk for firearm violence. In a study by Cota-McKinley and colleagues, (2001), age was a significant predictor of vengeful attitudes and vengeful behavior. Retaliatory violence is viewed as "correcting perceived injustices, restoring self-worth/respect, and deterring future violence" (Carter et al., 2017: 8).

Research supports that risk factors for youth involvement in gun violence include regular heavy drinking, drug dealing, gang membership, peer gun-carrying, exposure to violence, and experiencing personal rewards from crime. Protective factors include having at least two supportive adults in their life, aspirations to work and create a positive family environment, holding religious beliefs, and having concern for others (Pardini et al 2021).

Strategies addressing youth and young adult involvement in gun violence should be multi-faceted and include strategies addressing substance use, retaliatory violence, peer delinquency and norms supporting violence, impulse control, anger management, emotion regulation, and resiliency as well as strategies designed to remove threats in the neighborhood (Carter et al., 2017; 2020). As the risk of firearm homicides is greatest among black youth and young men, this is an important subgroup of focus (Bottiani et al., 2021). Examples that have not been listed elsewhere in this report are provided below.

Trauma, Mental Health, and Substance Use Treatment. Youth exposed to community violence or domestic violence are at increased risk of arrest for gun and other violent crime (Wamser-Nanney et al., 2019), thus, one focus for interventions is to mediate that risk before they become adults that offend. As one interviewee stated, the risk factors may go back many years before shots are fired. Culturally appropriate trauma-informed therapy not only incorporates knowledge of how trauma impacts development, behavior and functioning, it contextualizes disparities related to culture and race (SAMHSA, 2014). There are numerous trauma-informed interventions that evidence outcomes reducing symptoms of post-traumatic stress symptoms (e.g., Mindfulness-based Stress Reduction, Trauma Recovery and Empowerment Model, Cognitive Behavioral Therapy, Eye Movement Desensitization and Reprocessing, psychodynamic therapy, stress inoculation therapy, present-focused therapy, and cognitive processing therapy) (Han et al, 2021). After a review of treatments specifically for adolescents and young adults, Vogel and Rosner (2020) concluded that cognitive processing therapy improves symptoms of post-traumatic stress. Baetz and colleagues (2022) find support for trauma-informed PTSD treatment amount juvenile justice detainees.

Research has supported that youth and young adults who engage in risky firearm behaviors (compared to those who do not) have higher incidence of anxiety, depression and PTSD (Carter et al., 2020). Conduct disorder and substance use disorders are also risk factors (Kagawa et al., 2019). Of course, it is important to recognize that the vast majority of youth with a mental health disorder do not report gun carrying, but nearly two-thirds of adolescents that report gun carrying had a mental health disorder in a study by Kagawa and colleagues (2019). Effective mental health interventions aimed at modifying attitudes toward violence, building capacity to navigate potentially violent situations, impulse control, anger management, and aggression will be beneficial (Carter et al., 2020). Cognitive behavioral therapy is one approach (Blattman et al., 2022). Chicago's Choose to Change (C2C) program applied behavioral and mental health support to youth, including using cognitive behavioral therapy. The program evaluation reported increased school attendance, 32% fewer school misconduct incidents, and 38% fewer violent crime arrests (University of Chicago Crime and Education Labs, 2020). Mental health and substance use treatments would likely have to address barriers to service availability, affordability, and stigmatization.

Truancy and Drop Out. Multiple respondents to the community survey listed the need to address truancy in Carbondale as a correlate of gun violence. Interviewees and focus group participants also felt that failure to attend school is a key issue. Failure to attend school due to truancy or drop out is a predictor to involvement with the juvenile justice system. A study by Anderson (2014) showed that states setting the age for school dropout at 18 years showed 23% fewer violent crime arrests for teens aged 16 to 18 years compared to states that set a younger dropout age of 16 or 17 years. Relatedly, research supports that students aged 14 to 19 years who have been expelled are more likely to be involved in drug trafficking and gun carrying (Allen & Lo, 2012). This is an important subpopulation, and programs and policies that address truancy or dropout may reduce crime.

A study by Dupere and colleagues (2018) in disadvantaged contexts found that exposure to severe stressors (e.g., conflicts with peers/family/police, hospitalization, death of friend, parent fired, becoming a teen parent), especially as they accumulate, makes youth vulnerable for dropping out of high school. At the same time, youths' academic aspirations and appreciation of school offer some protections from this risk. Thus, attending to youth who experience these stressors while working to promote protective factors is one potential approach.

School, court, and community-based truancy programs aimed at specific students/parents with attendance problems can effectively increase school attendance (Maynard et al., 2012). For example, Bennett et al, (2018), evaluated a trial program to reduce truancy which involved partnerships between the school, parents and the police. Students not receiving the treatment saw an increase in offending, while those receiving the treatment did not experience a change in offending—suggesting benefits to participation.

Activities for Youth. Activities for youth, both associated with school and extracurricular, were suggested as a deterrent to gun violence by interviewees and focus group participants. Activities for youth and young adults was the most frequently noted suggestion for what community survey respondents thought would help reduce gun violence within three of the four high gun violence impact areas (1, 6, 7) and second only to police presence in area 10. Suggestions ranged from mentor/ apprenticeship programs, academic support and "something to give these kids hope." A common lament was that there was nothing for youth to do and concern was expressed that lack of supervision is problematic.

Extracurricular activities are meant to involve youth in prosocial activities with adequate supervision to prevent delinquency and problem behaviors. This is a concept that aligns with criminological theory, but about which there is little available research. However, youth mentoring programs, especially those emphasizing emotional support and advocacy, have been effective to address crime and delinquency, reduce aggression and substance use, and improve academic achievement (Tolan et al., 2008).

Strategies to Prevent Gang/Group Membership. Our findings point to group conflicts as part of the gun violence problems in Carbondale, and residents raised concerns about teens' involvement in 'gangs'. Available research suggests that the motives for getting involved with a group or gang tend to be perceived financial benefits, protection from violence, relations with family and friends who belong to a gang, support and belonging, status, and excitement. Thus, it may follow that prevention should focus on providing prosocial opportunities to meet these needs by creating connections to schools, parental and family involvement, neighborhood safety, and adult mentorship. However, most strategies aimed at preventing youth from joining gangs have not been rigorously evaluated (Simon et al., n.d.). A recent study by Roman and colleagues (2017) that conducted a review of gang programs endorsed focused deterrence, hospital-based interventions, jobs programs, programs that aim to address relationships and include street outreach, therapy, family, and fatherhood as focal areas. In general, their study supported efforts to promote prosocial networks among individuals "disillusioned with their gang". They cite research that shows that the most frequent reasons that individuals leave gangs are 1) disillusionment, 2) family responsibilities, 3) job responsibilities, and 4) criminal justice system involvement.

Strategies Addressing Reduced Feelings of Safety

Apart from reducing gun violence, improving residents' feelings of safety is also a way to reduce harm from gun violence. More than one in four Carbondale residents feel very unsafe walking in their area at night. Residents of area 6 feel especially unsafe outside in their area, both during the day (22% feel very unsafe) and at night (48% feel very unsafe).

One of the most important predictors of residents' feelings of safety in high crime areas is the social cohesion between residents of an area (e.g., spending time together, communicating, working together on neighborhood goals) and residents' engagement in informal social control behaviors (e.g., looking out

for each other and acting to enforce local norms for behavior and minor infractions (e.g., trash and debris, loitering, truant youth hanging out in the neighborhood)) (Kochel & Nouri, 2020). Therefore, programming designed to promote positive and more frequent community interaction in an area or working together on area goals could improve residents' feelings of safety (Sabol et al, 2004). A study by Stuart and Taylor (2021) found that improving social connectedness can even reduce murder rates.

One approach to building neighborhood collective efficacy was examined by Ohmer (2016). The study implemented a 6-week training program (six 90-minute sessions) on consensus organizing in a low-income neighborhood. It was designed to engage and mobilize youth and adult residents in the community to address a youth violence prevention concern of mutual interest while building relationships between residents and with external stakeholders and create shared prosocial community norms. Twenty people completed the training and participated in the community project. The evaluation demonstrated an increase in neighborhood relationships among participants. Participants were also significantly more likely to intervene to address inappropriate behaviors in the neighborhood.

Technological Solutions

Gunfire Detection Technology. Only about one in four residents who heard shots in their area reported the incident to police. Also, physical evidence and witnesses at locations of drive-by shootings tends to disintegrate quickly. Gunfire detection technology that identifies gunshots and automatically and immediately dispatches the GPS location to police officers can increase response time and may help to improve investigation and arrest for these incidents. ShotSpotter technology detects gunfire via the sound of gunshots and records the incident. It can be deployed in combination with camera technology that can allow the camera to swivel in the direction of the gun shots in an effort to visually capture shooters in action or in combination with license plate readers, which could be placed at high traffic intersections to record license plates that could be integral to investigations of shootings from vehicles. ShotSpotter data provides GPS coordinates of incidents that can then be mapped, allowing for a good depiction of shootings from vehicles and a comprehensive data source for examining geographic, temporal, and seasonal patterns of gunfire incidents. It is not reliant on public reporting of incidents and provides a clear record of when and where gunshots occurred.

A quasi-experimental field evaluation was performed by Watkins and colleagues (2002) and determined that ShotSpotter had an 81% success rate for correct detection of gunshots. Evaluation findings by Lawrence and colleagues (2019) suggest that gunshot detection technology is associated with faster response times and more evidence collection, however, their findings were unclear about the effects on crime.

Public Video Surveillance/Cameras. Public video surveillance in high crime hot spots can reduce crime and increase arrest without displacing crime to nearby areas (Ratcliffe et al., 2009). The premise is that offenders who believe that they are being watched will be disinclined to offend in a specific area, but it may also convey a message to average citizens who feel safer because of the surveillance and so will increase the legitimate use of a space, which also can reduce offending. Public video surveillance is a promising crime prevention practice that was evaluated by Piza and colleagues (2019) and showed an average of 14% decline in overall crime relative to comparison areas without surveillance. It also has shown effectiveness against disorder. However, it is less consistently effective as a crime prevention tool against violent offenses (Piza et al., 2019; Ratcliffe et al., 2009). This may, in part, be related to whether the cameras are actively monitored or passively recording (LaVigne et al., 2011). It may be more useful

as an investigative tool. Carbondale police reports of confirmed shootings demonstrate that cameras are an important source of information.

Targeting Hot Spots of Gun Violence

It has been suggested that about half of all criminal events are generated by small "hot spots" (Braga, et al. 2017; Sherman et al., 1989; Weisburd et al., 2012; Weisburd, 2015). This phenomenon holds true in Carbondale as well. Specific hot spot locations where shots fired incidents repeatedly concentrate can be addressed using hot spot policing and situational crime prevention approaches. Thanks to technological advances, police have been able to use crime mapping software to systematically identify, address, and control crime hot spots (Braga & Schnell, 2017; Weisburd & Lum, 2005). Hot spot policing has a strong evidence base for a variety of crime types, including violence (Braga & Weisburd, 2010; Sherman & Weisburd, 1995; Weisburd, 1997; Weisburd et al., 2017).

Hot spots policing can take the form of directed police patrols/presence—generally in short bursts such as 11-14 minutes of police presence at a time and could be focused to "hot times" if police had accurate enough data on day of week and time of day for the hot spots (Koper, 1995; Telep et al., 2014). Generally, any activities that officers undertake in a small high crime geographic area (e.g., roving patrols, stationary patrols, foot patrols, vacant house checks) result in less crime in that geographic area and nearby areas (Braga et al., 2014). Focus group, interview and community survey respondents made suggestions for "community policing" initiatives which include structured problem-solving models like Scanning, Analysis, Response and Assessment (SARA), "proactive policing" and moving officers from cruisers to foot or bicycles. Respondents linked this suggestion to both putting police where they are most needed and building trust between the police and the community.

Hot spots policing can also take the form of a problem-oriented policing or SARA-type problem solving approach. This means a thorough study specific to each hot spot to understand what characteristics or conditions about the specific area provides the opportunity for the gun violence to happen in the way that it does there, when it is happening, who is involved, the nature of the context immediately prior to gun incidents that may be a provocation, and what environmental and social context factors may be facilitating gun violence in that specific area (e.g., check lighting, traffic flow, sightlines, legitimate and illegitimate user presence, land use, the presence of businesses and business practices that could be affecting gun violence or the basis of gun violence). This approach requires response strategies tailored to address the way that opportunities are created for gun violence in that space, what draws potential offenders and victims to the area, lack of guardianship, and provocations. A meta-analysis completed by Hinkle and colleagues (2020) identified problem-oriented policing as one of the most promising police approaches to preventing crime (Skogan & Frydl, 2004; Weisburd & Majmundar, 2018; Weisburd et al., 2008; 2010). Indeed, studies that investigated police use of problem-oriented policing in communities saw a reduction of crime or disorder by 33.8% in targeted areas compared to control areas (Hinkle et al., 2020). Overall, hot spot policing in its various forms is effective in preventing crime (Braga et al., 2019). A study in St. Louis that focused hot spots policing on firearm violence by having officers conduct self-initiated activities (e.g. foot patrol, vehicle checks, building checks) during the evening hours when gun violence was most prevalent found significant reductions in firearm assault rates (Rosenfeld et al, 2014).

Address Gaps in Knowledge and Low Information Exchange

Our study revealed gaps in knowledge that hinder proactive and intervention efforts to address gun violence. First, existing police record management systems do not lend themselves to retrieving crime data or identifying patterns or connections and there is no one in the police department conducting crime analysis or crime mapping to be able to study and proactively address hot spots of gun violence, temporal patterns, repeat offenders, or any type of social network analysis. Replacing the outdated records management system with one that allows data to be retrieved expeditiously and in a format that can be analyzed and connected (e.g., between calls for service, incident reports, gun seizures, arrests) and to add fields that can flag elements of interest (e.g., gun involvement, group involvement) would permit an informed and evidence-based approach to gun violence. Second, employing crime analysis within the police department to analyze and identify patterns on a routine basis will permit the implementation of tailored solutions. Third, data exchange between criminal justice agencies is not occurring, perhaps in large part due to incompatible technology. For example, knowing the case resolution of the highest repeat offenders involved in retaliatory gun violence and when those individuals are expected to be released from incarceration back into the community may provide an early warning of potential conflicts that allow for a preventative approach (e.g., Cure Violence intervention, conflict mediation, restorative justice).

<center>**Gun Violence Initiatives with Little to No Evidence of Effectiveness**</center>

In addition to which programs may effectively prevent or reduce gun violence, below we provide research evidence about a program that have been studied but which demonstrate little clear evidence of effectiveness.

Gun Buyback Programs

Gun buyback programs assume that reducing gun availability would reduce gun crimes. They exchange money or gift certificates for firearms. Individuals turn guns in to police and police do not track participants (Makarios & Pratt, 2012). The guns are then destroyed. However, cities such St. Louis, Seattle, Sacramento, Milwaukee, Hartford and Buffalo that implemented a straight-forward gun buyback initiative saw either no effect or an increase in gun violence. Largely, these initiatives result in the collection of old or malfunctioning guns, the firearms that are not likely to be used in the actively occurring gun violence problems, except in some cases, suicides (Baumann et al., 2017).

<center>**Recommendations[3]**</center>

The recommendations from this study are that the City of Carbondale support evidence-based prevention and intervention initiatives like those outlined above that specifically are tailored to the type of gun violence problems occurring in Carbondale, while continuing to recognize underlying social challenges (e.g., poverty, inequality, structural racism) that contribute long-term to the crime and safety concerns in the community. Community organizations working to address crime and community wellbeing can be an effective approach alongside effective criminal justice practices (Sharkey et al., 2017).

We also advise that a funding strategy also incorporate a mechanism to assess the impact and effectiveness of the supported strategies, both as a mechanism for organizations to make mid-course corrections in implementation and to contribute to the long-term knowledge about what works in

Carbondale to reduce gun violence and promote feelings of safety. We further recommend that additional research could be undertaken to fill the knowledge gaps that this limited study could not address, including gathering information to better understand drive by shootings (e.g., who is involved as victims and offenders, temporal patterns, source of vehicles and guns), the general source of guns involved in gun violence in Carbondale, the role that straw purchases and gun theft may have in gun violence in Carbondale, and the role of groups/gangs in Carbondale.

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[3] As mentioned in the introduction, the charge of the report was to learn as much about the nature of gun violence as possible within a relative short timeframe and to subsequently recommend evidence-based approaches that are tailored to the nature of the problems in Carbondale. We believe we have provided a very comprehensive picture of the nature of gun violence in Carbondale and a breadth of potential evidence-based responses to the specific gun violence problems. Even so, we wish to acknowledge the challenges we faced, which can impose limitations on our findings and conclusions.

In collecting data for the analyses, we encountered an outdated records management system at Carbondale Police Department which would not allow them to retrieve data easily, requiring many records to be retrieved by hand. That took a couple months even with diligent efforts. Additionally, some agencies were not comfortable/able to provide the data we needed and instead sent highly redacted PDF files or aggregated statistics that did not allow us to analyze the data or to link data across sources. Additionally, response rates to household surveys are dropping nationally (National Research Council, 2013) and consistent with this trend, it was not high for the summer community survey in Carbondale. In prior initiatives, the lead principal investigator has had the time and resources to supplement mailed surveys with in-person surveys in high crime areas. That would have improved response rates for the Carbondale survey, but time and resources were limited. Also, with no constraints on time or resources, we would have sought to interview more key stakeholders, but as it was, we were able to go beyond the number proposed.

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<div align="center">**Appendix**</div>

Community Survey

A total of 1,208 Carbondale residents responded to a community survey in the summer of 2022. Invitations to participate were provided in Carbondale water bills, announced on the city's Facebook page and website, and announced through several community organizations (e.g. churches) and local news stories. The response rate for the survey was 18%; however, response rates varied by geographic area, from a low of 7% of households in Area 10 to 62% of households in Area 2.[4] Areas with the highest levels of crime and disadvantage tend to experience the lowest response rates on household surveys (Groves & Cooper, 2012; Pashea & Kochel, 2016), which posed a challenge especially in areas experiencing the highest levels of gun violence in Carbondale. Even so, small survey areas with greater homogeneity among residents can be fairly well-represented by a smaller number of respondents (Bachman and Schutt, 2020). Table A-1 provides the survey household response rate by area.

Table A-1. Survey Response Rate by Study Area

Study Area	Households Based on Water Bill	Completed Surveys	Household Response Rate
1	709	120	17%
2	34	21	62%
3	544	76	14%
4	1767	449	25%
5	621	77	12%
6	454	46	10%
7	110	168	15%
8	276	60	22%
9	129	70	54%
10	1094	81	7%
No area	--	17	--
Multiple areas	--	23	--
Total	6738	1208	18%

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[4] Among the 1,208 responses, 17 respondents did not identify the area where they live and 23 respondents identified living in multiple areas. These 40 respondents are therefore not reflected in the area-level analyses.

Areas

To DeSoto

To Murphysboro

To Carterville

To Anna

3

7

6

8

1

10

5

4

9

2

Old Hwy 13

Chautauqua Rd

W Chautauqua St

W Pleasant Hill Rd

E Pleasant Hill Rd

E Grand Ave

N Wall St

S Wall St

S Illinois Ave

S Oakland Ave

N Illinois Ave

N Giant City Rd

S Giant City Rd

Giant City Rd

US Hwy 51

— Roads

City Limit

Miles

0 0.25 0.5   1   1.5   2

N