A Comprehensive Approach to Combating Gun Violence through Innovation & Collaboration

A criminal fires his gun somewhere in your city. How often do you think community members call 9-1-1 to report the gunshots? 50% of the time? 75%? Sadly, research shows that on average, as little as 20% or less of all gunfire incidents are reported to 9-1-1, and in some neighborhoods of major cities, the reporting rate is closer to 10%. With reporting rates so low, how can communities, the public safety agencies charged with protecting them, or the city governments whose mission is to provide basic services to them hope to effectively combat the scourge of gun violence? How can they even hope to get their hands around a problem which, like the proverbial iceberg, lies mostly hidden from their view? This whitepaper seeks to begin to answer these and other related questions by proposing a comprehensive, community-based approach to gun violence reduction, involving community members, law enforcement, city officials, technology suppliers, and the wisdom of other communities who have faced similar challenges and succeeded in turning the tide against ever increased gun violence.
Innovation & Collaboration to Combat Gun Violence in Your City

Today, many cities throughout the United States and the world are plagued with an epidemic of gun violence and related crime, such as gang activity, drug and firearms trafficking. These insidious threats fester, sapping the vitality, health and—quite literally, the life—out of our communities. Deaths and injuries from gang- and drug-related shooting incidents number so many that they become common, everyday occurrences, and sadly those communities have now become desensitized to the violence and loss of life. Along the way, these same communities become first fearful of and later intimidated by the disorder and assault on their safety and quality of life. Criminal activity and the actions of the perpetrators of these crimes (in most cases, gang members and repeat criminal offenders) become the backdrop to their lives, and the sound of gunfire becomes the soundtrack to their nights. The community, first injured to the violence, now becomes desensitized and more likely to permit an even further erosion of the social compact and rich web of relationships which can prove vital in keeping violence at bay. National crime data show this trend limited not only to large, urban cities, but now spreading to outlying regions of metropolitan areas, smaller cities and to suburbia itself.

What may, on the surface, look like a community’s tolerance and hopeless acceptance for this violence and disorder often hides a grassroots desire to break out of the cycle and muffles a communities cry for help, even as it struggles with its own inability to resolve the problem. What will it take for communities to shift that perceived intolerance into a strong and united intolerance for gun violence? Is there a single solution?

A “one size fits all” solution simply does not exist. Cities and communities seeking to combat gun violence effectively require a comprehensive and collaborative effort, and as with all collaborations, the results will be as unique as the collaborators. The constituents will necessarily require leadership from all parts of the community and city officials. Likewise the solution will necessarily include effective gun violence abatement strategies and execution. This whitepaper outlines the major strategies and components required in a comprehensive gun violence abatement initiative and seeks to share best practices and ideas in building an effective initiative.

Gun Violence: More Than Just Homicides

The impact of gunfire in communities extends far beyond the cases in which bullets injure or kill their victims. Indeed, in many cases, there are no intended victims—guns are fired simply to mark territory, to establish dominance, to mar houses or other structures in order to establish turf. Nevertheless, media, officials and the public in general tend to focus primarily on homicides as the indicator of the level of gun violence (and therefore

Real Costs

Although homicides are lagging indicators of underlying gun violence—often peaking after gun violence itself peaks—they nonetheless exact a tremendous cost on communities. A 2010 RAND Corporation study estimates that the cost of a single homicide reaches approximately $8.6 million, a figure which includes the costs of first responders, investigations, prosecutions, medical care, court costs, incarceration, etc. More broadly, a 2011 Police Executive Research Forum (PERF) study of six US cities revealed gun violence and gunfire incidents during exceeded $38 million—for a one week period of time. These figures are startling, particularly when considered in the context of our national economy, which in its struggling has induced state and local municipalities to take thousands of police officers off the street and to reduce law enforcement resources in general.
the police reporting standard) when attempting to quantify crime rates. Indeed, although major crime categories such as homicides, aggravated assaults and other violent and lesser crimes are important indicators, they are “lagging” indicators: they measure the effects of endemic violence after it has boiled over and had an irreversible impact on the lives of victims. But they are neither illustrative of the broader and more far-reaching impact of actual gun violence in environments with illegal gun activity and crime, nor can they properly be treated as leading indicators—predictive indicators which might be used to stem violence before it is too late.

The economic and the societal costs of gun violence extend across many dimensions:

- Fear and intimidation
- Increased unemployment
- Homicides and other violent crimes
- Civil unrest and discord
- Lack of confidence in and distrust of police
- Economic disinvestment
- Poverty and blight
- Neighborhood flight
- Lack of opportunities for youth
- Reputational damage

All Cities Need Gunfire Awareness

Drugs and gangs have invaded communities—large and small cities, towns, and municipalities alike—and brought with them increased gunfire, gun violence, and homicides. Recently, in one such small rural community of some 7,000, dozens of people had gathered for a family reunion at a modest home when a gang member walked down the sidewalk and fired a shot into the air. Minutes later, a man was lying dead on the sidewalk. The death marked the third gang-related fatality in nine months in this city and served as yet another reminder of the gang violence invading small towns. While smaller towns and cities may experience less gunfire than larger cities, the devastation of the damage is no less.

Lack of Gunfire Awareness

Solutions Require New Thinking and Tactics

It’s hard to find even one city or town that has not seen the impact of the economic difficulties which began in 2008, particularly because so much of municipal budgets come from property tax revenues, and property values took the hardest hit during the recession. Many cities have had to reduce staff, initiate furloughs, forego raises, postpone procurements, renegotiate union contracts, revise pensions, and reduce
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or even eliminate services. Cities and police agencies have been challenged as never before to take a fresh look at how they can accomplish their mission of protecting the community while making the most of their limited resources across multiple operational segments in the agency and the community.

While most police chiefs and city managers have understandably not welcomed the current budget limitations, they have wisely viewed it as an opportunity to restrategize, restructure and redeploy for greater effectiveness and efficiency. Practitioners agree that agencies who continue to deploy resources in a traditional manner will find themselves in an increasingly untenable position. Without innovation or adopting of new practices and resources (such as technologies and data intelligence), their communities will experience even greater reductions in services.

A lot is at stake—for the community and for its law enforcement organizations. Police in particular recognize both the imperative and the opportunity it represents and in recent years have significantly increased their engagement and collaboration with others in their communities. Their efforts have made them more effective not only in controlling and preventing crime but also in evidencing the higher standard of professionalism the public demands and is eager to see. Accountability to the public, legitimacy in the eyes of the public, and innovative strategies for effectively completing their work under continuing constraints of limited budgets and resources are primary drivers of this new “overt professionalism” in policing.

Leading police practitioners, academic scholars and policing research organizations have for a long time generally advocated a comprehensive and holistic approach to crime control which integrates strategies and tactical operations with advanced technologies providing newly-available data and intelligence. Indeed, among police practitioners and experts, the consensus has emerged that effective policing can only truly be effective and have a positive impact when law enforcement agencies work in collaboration and partnership with their city officials, community leadership and other key influencers and stakeholders.

“Innovation and Collaboration to Combat Gun Violence”

Innovative, data-driven tactics are the “silver lining” amidst resource scarcity and austere budgets

In this respect, the impetus to do more with less, to increase professionalism and community engagement, to leverage new data sources and innovative tactics, may indeed represent the “silver lining” in the resource scarcity storm clouds of budget austerity. Today, as a result of these efforts, data-driven and intelligence-led policing have been effectively put into practice in many agencies around the world and are helping support improvements in policing outcomes, including better use of limited resources, focused deployments and enhanced investigations and case closures.

Everyone has a Stake in Stopping Gun Violence

The key to an effective, holistic approach to gun violence reduction remains to empower the entire community to focus on collaborative strategies in fighting back against gun violence. Building and implementing an effective strategy and plan to combat gun violence issues thus requires the partnership and commitment of key groups within cities and government (the stakeholders).
Why Are Gunshots Not Reported to 9-1-1?

Even when a city is under siege from gun violence, reporting rates for gunfire can be as low as 20%. In fact, data from cities nationwide show that the higher the daily gunfire rate is, the lower the 9-1-1 call rate is. As a result, the 9-1-1 centers of many cities never learn about 80% or more of gunfire incidents within their areas of service. With incomplete data, police and law enforcement often significantly underestimate gunfire incidents rates in those areas, because they only know about 1 in 5 cases.

With few exceptions, five sequential events must occur in order for police to learn about a gunfire incident. They all rely on a citizen to perform a complex series of tasks. He or she must:

- hear the sound of a gun being fired
- identify it as a gunshot
- make the affirmative decision to call police
- have the ability to make the call
- provide the location of the gunshot

Those five steps require substantial commitment on the part of reporting citizens. At any step in the process, they can decide that the process is taking too long, has become too intrusive, or puts them or their families at too great a risk. This is particularly true because neighborhoods in which high levels of gun activity take place typically also have strong “anti-snitching” cultures. The act of calling 9-1-1, and thereby exposing oneself to possible follow-up by police which might be noticed by the neighborhood, makes calling 9-1-1 an unattractive offer. It’s far safer—some community members think—to let someone else call 9-1-1, and risk harassment and retribution after the police leave.

Even in the best case, this call to 9-1-1 takes time. Data show that the first call to 9-1-1 after a gunfire incident comes in on average roughly two and a half minutes after the gun is fired. 9-1-1 operators must then process the call, assess its credibility, and hand it...
over to dispatch, a process which itself takes between 3 and 8 minutes. By then, tactical advantage is lost, and the seeds of response failure are already sown. By the time responders have a chance to respond, 5 to 10 critical minutes have elapsed.

And the 9-1-1 call doesn’t provide the necessary information for a targeted response. Unfortunately, even when a 9-1-1 call does come in, it provides information which by its nature is usually unreliable and subjective. A community member sitting in his kitchen cannot pinpoint the location of gunfire 500 yards away. All he can report is his own kitchen’s location. Thus police are already working at a deficit: they know where the reporters are, but they don’t know where the gunfire is.

**9-1-1 Callers Reporting Gunfire: A Failure to Communicate**

9-1-1 Caller: ”I think I heard gunshots somewhere close by… not sure what direction they came from…no, I don’t know how far away; sounded close!…happened about 5-6 minutes ago…we weren’t sure but decided to report it anyway…I can’t remember how many shots… I don’t know if anyone is injured…”

Often left unspoken is the more insidious problem that the community observes police response and uses the quality of that response to decide whether to call 9-1-1 the next time. Unfortunately, there simply is no way for police to get the information they need to respond to most calls to 9-1-1 regarding gunfire. With vague, imprecise information, police can only respond to the neighborhood, not the precise location. They are left with little choice but to ask neighborhood residents what they saw, thus possibly giving the (erroneous) impression to potential 9-1-1 callers that their call will only “make trouble” for their own neighbors. Thus the community ceases to call, as they perceive either that they will be making trouble or the police will be unable to respond effectively anyway. The rare exception, when a person visually witnesses a shooting and is willing to call 9-1-1, then become the only cases in which 9-1-1 finds out about shootings.

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<tr>
<th>Reasons Not to Call 9-1-1 About Gunfire Violence Reduction</th>
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<td>• Fear of retribution by perpetrators</td>
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<td>• Distrust of the police</td>
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<td>• Intimidation by local gang members and criminals</td>
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<td>• Feeling that nothing will stop the gun violence and criminal activity</td>
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**Comprehensive Approach Needed to Combat Gun Violence**

Loosening the grip which gun violence holds on our communities means tackling the violence in several key arenas:

- Gunfire Incident Response
- Investigations
- Prosecutions and Convictions
- Crime Analysis and Intelligence
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Each of these areas is critical to developing and then implementing comprehensive gun violence abatement efforts, and each is individually necessary, but not sufficient without the others. These four areas predominantly require the attention and focus of law enforcement, police and criminal justice officials. However, the community can also support these specific areas by cooperating in investigations, providing witness testimony and evidence, serving in neighborhood watch programs and other cooperative roles. City officials, local business leaders and coalitions, and community organizations can complement this by actively taking a stance against gun violence and related crimes, and putting their influence to work within the community and with other stakeholders, like local and state representatives and legislatures.

The specific benefits from each of these areas of focus truly support the quality of life and sustainability of the communities.

Incident Response

• Gunfire incident awareness
• Actionable situational intelligence
• Safer and more effective strategic and tactical response
• Increased apprehensions and firearm confiscations
• Increases officer safety
• Reinforces positive community engagement

Investigations

• Faster location of evidence and witnesses
• Improves productivity of investigative resources
• Forensic data strengthens investigations

Prosecutions & Convictions

• Empirical data to strengthen prosecution
• Incident data is court-admissible and defensible
• Expert witness services and certified forensic reports

Crime Analysis & Intelligence

• Gunfire pattern awareness
• Provides comprehensive information otherwise unobtainable
• Strengthens predictive analysis and intelligence
• Improves strategic and tactical planning and resource management
• Improves crime reporting and analysis to track improvements and support funding

Teamwork remains critical among all stakeholders to create effective gun violence abatement efforts, but ultimately, the key benefit is the development of deep community engagement and partnership which results from the police and law enforcement professionals working directly with their community residents and officials to make a positive impact.

• Trusting relationships between police and community members
• Community confidence in the police
• Neighborhood accountability and responsibility
• Economic investment for improvement

“People weren’t calling [9-1-1] because it [gunfire] happened so often they were desensitized.”
Data Is Critical

Imagine this scenario in your community: During the night, a gun battle erupts. Rival gangs, two active shooters, an innocent bystander gravely wounded...and no one calls 9-1-1.

Unfortunately, too many people don’t even need to imagine this. It plays out regularly in their neighborhoods, and they live in fear, hopelessness and resentment. In fact, as the data show, nobody calls 9-1-1 four out of five times when there is gunfire—in other words, there is a lack of gunfire awareness four out of five times.

Without the calls to 9-1-1, police cannot even be aware that this horrible incident has occurred. At the same time, community residents don’t know that the police were not aware. Indeed, they may feel anger or bitterness because they perceive the police are ignoring the gunfire and their need for safety and security. Distrust of law enforcement and authorities, and disengagement from others outside the neighborhood grows and festers, eventually leading to a fatalistic conviction that “nobody cares” within the community.

But this does not have to happen. Today, new technologies can provide data and intelligence that was never previously available. These technologies can provide gunfire awareness. And that data can be delivered in real-time, into the 9-1-1 dispatch centers and even to the mobile computers and mobile devices in the hands of police field personnel and first responders. Combining those data with advanced and modern policing methodologies leads to intelligence-led strategies that effectively enable police to be more responsive and safe; make better decisions on deployments and use of their resources; and analyze crime patterns for better planning and operations.

Gunfire Awareness

With many communities experiencing, on average, less than 20% of gunfire incidents called in to 9-1-1, it’s difficult to underscore how critical it is for law enforcement to know about the other 80% of gunfire incidents. Without the “when” and “where” information on gunfire, police are extremely challenged to combat a gun violence problem and communities suffer, sorely.

One technology, the gunfire location, alert and analysis service ShotSpotter™, from SST, Inc. (the author of this whitepaper) is a proven technology solution that uses acoustic sensors in wide-area arrays throughout communities to detect the precise location of gunshots immediately upon discharge. With over 80 such systems deployed in communities throughout the US, and 27 U.S. patents issued for its technology, it’s the only solution of its kind in the world that uses wide-area acoustic surveillance to triangulate and pinpoint gunshot locations. Police agencies throughout the U.S. and abroad have been using the ShotSpotter solution for more than a decade and a half to get the critical gunfire data they can’t get from a 9-1-1 call.
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Now, imagine the scenario again…but this time with a gunfire detection solution in use.

During the night, a gun battle erupts. Rival gangs, two active shooters, an innocent bystander gravely wounded…and no one calls 9-1-1.

ShotSpotter provides gunfire awareness otherwise unobtainable from any other source. With this gunfire awareness, community’s law enforcement personnel can be ready to react quickly to individual incidents. Here’s how it works:

- Within seconds, ShotSpotter detects and pinpoints the precise location of each gunshot;
- The SST Incident Review Center immediately reviews the gunfire data and sends the qualified alert with critical intelligence to dispatchers and officers in the field, allowing them to determine the safest and fastest tactical response;
- Officers arrive on scene in time to administer first aid and apprehend one of the shooters;
- Investigators find shell casings that lead to the recovery of the weapon and an arrest days later;
- Audio evidence from the shooting helps prosecutors confirm that two shooters were involved and secure two convictions;
- Over the long run, ShotSpotter incident data helps the agency identify hotspots and deploy patrols more proactively.

Incident Response

To protect their communities effectively, police need a mechanism to enable rapid yet safe response to all gunfire, not just those incidents that happen to result in a call to 9-1-1, which, as we’ve learned, only comes 20% of the time. The accurate and precise information that a gunfire location service provides, such as street location, latitude and longitude coordinates, number of rounds fired, and, speed and direction of travel if the shooter or shooters are moving (like in a moving vehicle or running) provides not only for a rapid response, but a safe response—by providing more situational awareness than any other tool available.

ShotSpotter incident data can immediately tell them that, for example, that:

- 11 rounds were fired
- from a car going 19 miles an hour, northbound,
- in front of 123 Main Street,
- 28 feet from the front door,
- at 01:47am,
- from what appears to be a single, semi-automatic weapon.
When Responding to Gunfire, Situational Awareness Is the Key to Officer Safety

That’s a level of situational knowledge police have never had before. Patrol officers overwhelmingly report that when they roll on a ShotSpotter alert, they have more information and there is less chance of turning a corner and being surprised. Officers in jurisdictions that have employed the gunshot location service often query the dispatcher if the alert came from ShotSpotter so that they are confident in the source of the information.

Investigations

Traditionally, investigations involve reactive, after-the-fact activities, wherein investigators hope to make an arrest that will lead to punishment, and ultimately, also serving as a deterrent to like behaviors. Numerous studies have shown that random circumstances—such as the presence of a witness or physical evidence—determine the probability of an arrest. The odds of a successful arrest are often determined by the random presence (or lack of) of these additional data points. Gunfire data and intelligence shift the odds in the favor of investigators by providing many more cases in which these additional data points exist. They introduce additional “solvability factors” which allow investigators to increase their odds of making arrests and closing cases.

With the accurate data on a gunfire incident known, law enforcement can:

• Canvas and interview around the precise incident location for witnesses (not just in the general neighborhood)
• Detain and interview potential suspects
• Pose factual and counter-factual questions, based on data suspects do not realize they have (such as number of rounds fired, precise time and sequence of events, etc.) to establish witness and suspect credibility
• Locate unknown, unreported victims
• Search for evidence and weapons
• Correlate data to past incidents for crime analysis and predictive policing

In officer involved shootings, the data have been used to contradict witness testimony that police fired first. In other cases, alerts have led police to victims who likely would have died without prompt discovery and attention to their wounds. It still other cases, these data have proven, for example, that multiple weapons were used in a shooting, even when shell casings from one or multiple weapons were not recovered, and even that multiple people were firing those weapons, based on the timing and separation of the individual rounds fired.

In Nassau County NY, the Police Department installed ShotSpotter in a three-square-mile zone to address a growing issue with gunfire incidents. “We found rates of random gunfire that were astounding to us,” said a former deputy commissioner of Nassau County Police. “What was more bothersome was that we were not getting calls about it,” he added. “People weren’t calling because it happened so often they were desensitized.”
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Prosecutions and Convictions

When the police can respond faster (and with more information) to a shooting incident, they are more likely to apprehend the shooter or shooters, locate witnesses, and recover the weapon, all of which bolsters the prosecution’s case and increases the likelihood of a plea bargain or conviction at trial. In addition to events that occur during the incident, gunfire data helps aid the prosecution of the case by supplying empirical data about the acoustical aspects of the event; such incident data is court-admissible and defensible.

Evidence becomes the imposition of consequences. That this is seen as a deterrent is evidenced by the drop in gun violence in all areas when the ShotSpotter solution is in place for which statistics are available. Cities are realizing the benefits of the gunfire data in their prosecutions and convictions for gun crimes and serious offenses.

Minneapolis has a successful record of leveraging gunshot detection technology to arrest and successfully prosecute violent criminals. In a 2010 homicide case, ShotSpotter integrated with a video surveillance system served as the only evidence which led to the arrest of two murder suspects and their subsequent convictions.

When shots were fired on September 17, 2010 near the corner of North 30th Avenue and North Colfax Avenue, ShotSpotter immediately detected the gunfire and directed a video camera nearby to slew toward the location of the gunfire. The video camera began recording the scene. Part of what it captured was a Dodge Intrepid carrying Michael James Funches and Christopher James Hayes driving away from the scene of Christopher DeRonde’s murder. There were no witnesses to the crime.

With the ShotSpotter evidence, Hayes was found guilty of killing DeRonde, and MPD claimed their first closed homicide case based on key evidence from ShotSpotter.

...ShotSpotter testimony gave a complete picture of what took place that night. Hearing the first gunshot explained the blood trail, and the rapid succession of the next three helped justify the first degree intentional homicide charge instead of the lesser offense of felony murder.

Comments from a Milwaukee Police Department Lead Investigator regarding the jury’s feedback on ShotSpotter evidence in a case

Crime Analysis and Intelligence

Experienced investigators, detectives and crime analysts have deep knowledge of frequent offenders and locations that have generated an inordinate number of reportable incidents. These law enforcement professionals have become increasingly more sophisticated and analytical through the integration of new technologies and data sources with traditional and new policing strategies and methods. Today’s intelligence-led policing strategies help provide efficiency and effectiveness to police operations.

One study estimated that 10% of the victims in the US are involved in 40% of the victimizations; 10% of the offenders are involved in more than 50% of serious crimes; and 10% of the places are the sites of roughly 60% of calls for service. For certain crimes like gun violence these clusters are even more pronounced.

Accordingly, accurate gunfire awareness data doesn’t just lead to arrests or make officers feel safer because they know they are being dispatched to the right location, it allows entirely new levels of analysis to be performed, and therefore new efficiencies to be gained.
Community Benefits

Danger lies in permitting a community perception that law enforcement “does not respond” when guns are fired. The downward spiral of mistrust, apathy and even antagonism is sped by nightly events where police simply do not have the necessary gunfire awareness to reverse this impression. Citizens who feel law enforcement doesn’t care about them and refuses to meet their needs for safety and security may understandably be more likely to refuse to assist the police when their help is needed. Police are often stymied by this rift between them and the people they are sworn to protect and serve.

“What price do you put on a life?”
—Quincy Police Chief Richard Ackerman

Intelligence-led and community-based policing improves the engagement between police and community residents. Residents see officers responding to incidents, arresting perpetrators whom they themselves fear, and rendering help for victims. People feel more confident that the police and the city care about them and their well-being. Communities and law enforcement are able to help youth at risk more by creating real deterrence to illegal gun use, showing the consequences of gun violence, and engaging them sooner in community-based social programs. Gunfire awareness feeds an upward spiral of increased response, increased trust, and mutual reliance.

People begin to take more accountability for their communities as safety returns with lowered incidents of gunfire and additional arrests of gun-toting criminals and gang members. Honest citizens are not afraid to speak out and assist the police as they feel safer. Economic vitality begins to shift as business and people invest more in safe communities.

Summary

There remains no “one size fits all” solution to gun violence. But cities and communities which recognize that they first need gunfire awareness, leverage new sources of data to achieve it, and then empower their public safety agencies to use that data proactively and intelligently have a head start on the problem. Cities across the country have transitioned to awareness to engagement and finally to gunfire reduction. No single stakeholder can effect such a broad-reaching transition unilaterally. Law enforcement, community leaders, government officials, the private sector, and technology providers must focus their collective efforts on a holistic approach to gun violence awareness. We, at SST, are honored to play our part in the larger effort.