



March 14, 2024

Somerville City Council
93 Highland Ave.
Somerville, MA 02143
citycouncil@somervillema.gov

via email

Re: ShotSpotter: Unreliable, ineffective, and a threat to civil rights

Dear City Councilors,

We write on behalf of the ACLU of Massachusetts (“ACLUM”) to raise concerns about Somerville’s use of ShotSpotter technology—a surveillance technology that markets itself as a solution to gun violence but instead is unreliable, ineffective, and poses serious threats to basic civil rights.

In February 2024, Chicago Mayor Brandon Johnson followed through on a campaign promise, [announcing](#) that the City would not renew its ShotSpotter contract. Mayor Johnson lamented the “pivotal role” ShotSpotter played in the police killing of 13-year-old Adam Toledo, citing research that ShotSpotter “is unreliable and overly susceptible to human error.” He pledged to focus resources on more effective anti-violence strategies in consultation with community partners.

Chicago is not the only community to end its relationship with ShotSpotter. Cities including [Canton](#), OH; [Charlotte](#), NC; [Dayton](#), OH; [Durham](#), NC; [Fall River](#), MA; [San Antonio](#), TX have all decided to end the use of the controversial technology. In [San Diego](#), CA, after a campaign by residents to end the use of ShotSpotter, officials let the contract lapse. And cities like [Atlanta](#), GA and [Portland](#), OR tested the system but then decided against adoption.

Here in Massachusetts, Mayor Correia of Fall River [decided](#) to cut ties with the company because it was an expensive, unreliable system that didn't “justify the cost.”

ShotSpotter is indeed unreliable and ineffective, and even worse, the technology threatens basic civil rights. For these reasons, Somerville ought to follow Chicago and other communities nationwide and discontinue its use. We welcome an opportunity to discuss these issues with the Council.

Marketing Hype versus Reality: The Facts about Gunshot Detection

While the company claims on its website that the system “has a 97% accuracy rate, including a 0.5% false positive rate,” considerable independent research and analyses have shown that this is misleading, to say the least.



Massachusetts

ShotSpotter uses microphones, computer software, and human analysts to record and identify potential gunshots.¹ While the company's promotional materials tout the effectiveness of its algorithm, human analysts play a [key role](#) in classifying gunshots, often [reclassifying](#) them entirely. According to [an analysis conducted last year](#), in approximately 1 in 10 cases, a human analyst rejected and reclassified the algorithm's classification. This can happen when the algorithm erroneously identifies another loud sound, like a car backfiring or a firework, as a gunshot.

Such false alarms are common. [A study](#) of seven police departments commissioned by ShotSpotter found that false alarms included “dumpsters, trucks, motorcycles, helicopters, fireworks, construction, vehicles traveling over expansion plates on bridges or into potholes, trash pickup, church bells, and other loud, concussive sounds common to urban life.”

Multiple independent studies have called into question ShotSpotter's claims of reliability and accuracy:

- A [report](#) by Chicago's Office of the Inspector General conducted a sweeping analysis of over 50,176 ShotSpotter alerts, finding that more than 90% of ShotSpotter alerts do not produce evidence of gun-related crime.
- [In Houston](#), over 80% of ShotSpotter alerts were found to be dead ends. Ironically, ShotSpotter implementation increased response times for non-ShotSpotter-related incidents as police were pulled away from other duties to respond to ShotSpotter alerts.
- The Northwestern School of Law's MacArthur Justice Center [found](#) that, of 46,000 police deployments initiated by ShotSpotter alerts, only about 14% led to a police report. Of those reports, only 1 in 9 involved a gun, i.e., 11% of total alerts. In effect, this means there were over 40,000 dead-end ShotSpotter deployments in less than two years.
- The same report found that ShotSpotter has a high rate of false positives and false negatives, underscoring that the technology is ineffective at its stated purpose. An analysis by [South Side Weekly](#) found that ShotSpotter fails to detect hundreds of actual shootings. In 2023, Chicago police flagged over 575 instances of gunfire that did not generate a ShotSpotter alert, including one high-profile shooting with 55 rounds that did not generate any ShotSpotter alerts.

Evidence Suggests Gunshot Detection Technology is Not Making Communities Safer

Equally important is additional research that shows **ShotSpotter does not improve public safety outcomes for residents**. A 2021 *Journal of Urban Health* study of [68 large metropolitan counties](#) from 1999 to 2016 found no reduction in firearm homicides, murder arrests, or weapons arrests in response to the deployment of ShotSpotter. Their analysis found that **“implementing ShotSpotter technology has no significant impact on firearm-related homicides or arrest outcomes.”**

¹ ShotSpotter devices have recorded human voices, raising extremely serious concerns about privacy and adherence to the state's Wiretap Act, which prohibits secret audio recordings. See *Commonwealth v. Denison* (2015), wherein the SJC ruled ShotSpotter audio recordings of human voices inadmissible.

A Surveillance Technology Oversight Project (“STOP”) [report](#) found that ShotSpotter surveillance increases police activity but wastes officers’ time because it fails as an investigative tool. According to the report, the technology provides no evidence of gun-related crimes in approximately 90% of cases. ShotSpotter also produces exceedingly few arrests (less than 1 per 200 stops) and recovered guns (less than 1 per 300 stops).

Proponents of ShotSpotter have claimed that it can save lives, because its alerts result in faster emergency response times. But research indicates this too is a highly misleading claim. For instance, [a 2021 scientific study](#) of a ShotSpotter implementation in Hartford, CT compared the outcomes of 157 shooting victims where emergency services were dispatched either due to a ShotSpotter alert or an unrelated event (such as a 9-1-1 call). The study, conducted in collaboration with the Hartford Police, concluded that ShotSpotter-related shooting outcomes were no different to non-ShotSpotter shooting outcomes with respect to prehospital treatment times, time spent at the scene, or time taken to transport the victim to the hospital.

ShotSpotter Has a Negative Impact on Civil Rights and Civil Liberties

Like other kinds of black box algorithmic technologies, ShotSpotter raises due process issues because its “secret sauce” is not available to criminal defendants who may want to challenge the scientific legitimacy of its technology or methods. Complicating matters further, the algorithm is not the sole determinant of whether a noise is classified as a gunshot; human analysts review the technology’s assessment and make their own conclusion, which is then sent to police departments.

Upon police request, ShotSpotter company officials can even manually adjust details such as the location or the count of shots fired. According to a ShotSpotter employee, it is common for city dispatchers or police officers to make such adjustments, raising concerns about the validity and neutrality of ShotSpotter data. In 2016, the employee [admitted](#) that the company reclassified a ShotSpotter recording from a helicopter to a bullet at the request of the police, saying such changes occur “all the time” because “we trust our law enforcement customers to be upfront and honest with us.”

Alarmingly, an [investigation from the Associated Press](#) found that forensic reports by ShotSpotter employees were used to improperly claim that a defendant shot at police; in other cases, the reports provided questionable counts of the number of shots allegedly fired by defendants. Altogether, these examples raise serious concerns about the use of ShotSpotter as evidence in criminal cases and the rights of defendants.

Worst of all, ShotSpotter can endanger the very people it is meant to safeguard:

- In March 2021, Adam Toledo, a 13-year-old child, was [killed](#) by Chicago Police Department officer Eric Stillman. Stillman was responding to a ShotSpotter alert of shots fired when he saw Toledo and 21-year-old Ruben Roman near an alley. The police officer chased Toledo down the alley and fired one shot as the boy turned toward him with his hands raised.



Massachusetts

- In August 2021, Michael Williams, a 65-year-old Black man from Chicago, was [wrongfully](#) charged with murder and spent a year in Cook County Jail as the result of a ShotSpotter alert. While in jail, he contracted COVID-19 twice and considered taking his life. The brush with ShotSpotter took a severe toll on his mental health and relationship with his family. Eventually, his case was dismissed due to insufficient evidence, but only after many months of suffering and uncertainty.
- Most recently, in February 2024, Chicago police [opened fire](#) on a child playing with fireworks, after a ShotSpotter alert led them to the scene. Luckily, no injuries were reported, but this incident—like the case of 13-year-old Adam Toledo— could have been fatal.

ShotSpotter false alarms create situations where police search for a shooter where there isn't one, leading to escalation that can endanger nearby residents.

Finally, ShotSpotter poses a threat to Fourth Amendment rights. ShotSpotter alerts in Chicago have been used as a pretext for searches, with the [Chicago Office of the Inspector General](#) finding at least 2,400 cases of stop-and-frisk that were linked to a ShotSpotter alert. Police use alerts as a proxy for “crime” and therefore a pretext for searching innocent individuals who happen to be in the vicinity. Like Michael Williams of Chicago, random people can be caught in this dragnet by virtue of being in the wrong place at the wrong time.

Ultimately, ShotSpotter compounds existing threats to civil rights and civil liberties for already over-policed communities of color, putting them at increased risk of dangerous—and even fatal—interactions with the police.

For these reasons and due to the cost burden, cities across the country are moving away from ShotSpotter. Chicago was only the most high-profile community to kick ShotSpotter to the curb.

- In 2016, the City of Charlotte in North Carolina canceled its contract with ShotSpotter because it was too costly and didn't produce benefits for public safety. The Charlotte Observer [reviewed](#) the department's use of ShotSpotter in the first four months after the system was installed and found that only 1 in 41 ShotSpotter alerts was linked to evidence of gunfire.
- In 2017, the police chief in San Antonio, Texas, [pushed](#) to end the city's ShotSpotter program and redirect funds to focus on more community engagement.
- In 2018, here in Massachusetts, Fall River police [axed](#) the system because ShotSpotter worked less than 50% of the time and missed all seven shots in a downtown murder.
- In 2022, the Atlanta Police Department [rejected](#) ShotSpotter twice after free pilot programs, citing budget concerns and poor results. An internal report deemed the technology ineffective, finding that ShotSpotter often duplicated alerts, overreporting the number of actual shootings.
- In June 2023, the city council in Portland, Oregon [decided](#) not to move forward with ShotSpotter a failed pilot program in 2022. Instead, the mayor unveiled an anti-violence initiative that relied on street-level outreach to address the root causes of gun violence.



- In December 2023, the City Council of Durham, North Carolina, voted [against](#) extending the ShotSpotter contract after just one year of use.

In Somerville, a city whose elected officials are at the forefront of protecting civil rights and civil liberties, the City Council should do away with this unreliable, ineffective, and dangerous technology.

Public safety shouldn't rely on unproven, faulty technologies that threaten basic civil rights. Instead, it should be grounded in respect for rights, transparency, and a genuine commitment to the well-being of all communities.

We respectfully urge the City Council to vote to withdraw authorization for ShotSpotter gunfire detection technology.

Sincerely,

Kade Crockford
Director
Technology for Liberty Program
Kcrockford@aclum.org

Emiliano Falcon-Morano
Policy Counsel
Technology for Liberty Program
Efalcon@aclum.org

Julie Lee
Technology Fellow
Technology for Liberty Program
Jlee@aclum.org