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Detecting Gunshots
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Northern California-based [ShotSpotter](#), the world's leading developer of gunshot location technology, recently announced the release of an upgrade to its highly-effective weapons-fire detection system, ShotSpotter Gunshot Location System (GLS). Release 5.0, includes a new mobile version (PSC Mobile) of its Public Safety Console (PSC) that provides real-time updates on gunshot events, including "dot on the map" incident details with visual and audio alerts, for officers and medical personnel in the field.

The system is used domestically by police departments (and other first responders) in large and small cities to quickly and accurately detect gunshots as they occur. By deploying sensors throughout a coverage area, ShotSpotter puts accurate information immediately into the hands of police. Rather than depending on good Samaritans or victims to phone 911 in the minutes or hours following shots fired, police can be fed accurate data about the time, exact location, and situational details--including video--surrounding a gunfire incident.

"Because people in areas with frequent gun violence are afraid to call in, or they are immune to the sound of shots, less than 50% nationally get reported to police," says Gregg Rowland, senior vice president at ShotSpotter. "We give police information that they didn't have before; now they get all the gunshots fired in the city. Citizens are not trained observers. They may hear the echo off a building or they may hear it from one direction when it came from another. The call may come in five to ten minutes after the event happens and send first responders on wild goose chases; first responders can't figure out where it came from and they get there too late to render any aid or to get any witnesses or to get forensic information. We present gunshot information to them within ten to 15 seconds. Officers sometimes arrive while the shooting is still going on. They can render aid to individuals, get video, identify witnesses, and get evidence left behind by the shooter, which is better for criminal prosecution."

Every city where ShotSpotter has been deployed, including Los Angeles and Oakland, California, and Washington, D.C., reports that gunfire-related arrests have gone up significantly—in some cases, by 50%--violent crime rates have dropped by a minimum of 30%, and gunfire rates have been reduced by as much as 80%.

"There is a deterrence factor," says Rowland. "Cities tell you that once they make a few arrests due to it and they announce it publicly, that deterrence factor is huge and has been a good bit of the impact in reducing violent crime in the cities where it's installed. The gang members do bravado shooting, just to make themselves known--those, and gang-style murders don't happen in ShotSpotter cities anymore."

Wireless sensors are at the heart of the ShotSpotter system and Release 5.0 adds mobile sensors for individuals and vehicles.

"We have highly portable sensors to be mounted on officers, soldiers, SWAT teams, etc., so it's people moving around. It took the ability to use prolific wireless networks to make this happen. We need good coverage. By having all this good wireless technology out

there, we can build these small portable compact sensors," says Rowland.

The portable sensors are about the size of two PDAs stacked on top of one another, and include an antenna, batteries, and support for any radio network that users might need to connect to, including 802.11a/b and new license bands.

"Version 5.0 is a lot more wireless friendly," says Senior VP, Gregg Rowland. "It includes the ability to use any wireless network to connect our sensors. Our older software was designed to communicate over phone lines. Now, we can plug our sensors into any network. We're wireless agnostic."

While the system is highly effective in open areas, such as city streets, parks, and military environments, its primary limitation is detecting indoor events. In the case of a shooting incident, such as the one at [VA Tech](#), which took place inside a building, the sensors are not guaranteed to detect gunfire or assist in speeding response.

"We're hoping that campuses won't have a lot of gunshot problems," says Rowland. "But the system only works well if the shooting is outside. If someone was shooting inside a dorm room or a classroom with no open windows, there's a good chance we might not even detect it. The advantage of our system is that if something is happening outside, we'll tell the police exactly what was happening."

For cities that adopt the ShotSpotter system, the learning curve for using the technology is not steep, but it does require comprehensive training and a new level of readiness on the part of first responders who might suddenly find themselves in the midst of a shooting, rather than on site long after the perpetrator has fled or been disarmed.

"We train the dispatchers. We train the patrol officers. We leave trainers behind who can train detectives and prosecutors on how to get evidence out of our system. We want the PDs to be as self-sustainable as possible to do their work," says Rowland. "It usually takes the police department about a month to really get up to speed and figure out how to use it. They have to change a lot of policies. The info comes so quickly and they have to learn how to take the information and do something with it. We double the amount of shots fired on the first day it's turned on. They have to be equipped to deal with that and dispatch officers accordingly. Initially, they have to deal with the fact that officers may arrive in the middle of a gun battle, rather than when it's over."

The cost of deploying ShotSpotter in an urban environment depends on the topology and the options. For an average-sized city, the cost is about \$1,000,000. For larger systems, such as the one in Washington, DC, the price can double.

Current ShotSpotter cities also include Phoenix; Rochester, New York; Minneapolis; Charleston; Birmingham; Chicago; East Orange, New Jersey; and coming soon, Boston.

ShotSpotter is also used by three of the four branches of the military: Army, Air Force, and Marines.