

Louisville Plans to Become First U.S. City to Use Drones to Respond to Gunshots

The city has applied for federal permission to launch self-guided drones to collect video at the scene of gunshot reports coming from its ShotSpotter system.

BY BEN MILLER / FEBRUARY 16, 2018

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Louisville, Ky., is vying to become probably the first city in the country to use autonomous drones to respond to the sound of gunfire.

The city has applied for a special program the Federal Aviation Administration is running, where it will give a handful of cities temporary permission to get around long-standing drone rules in order to run pilot projects. Those rules, which operators typically have to get individual waivers to get around, include flying drones outside the operator's line of sight, flying at night and flying above people.

All of those rules would make it pretty difficult for a city to do what Louisville wants to do. The city has ShotSpotter sensors spread throughout its urban fabric, listening for gunshots. When such a noise is picked up, and interpreted by ShotSpotter's analysts to be gunfire and not a similar sound, a notification is sent to police who can respond to the scene.

Louisville wants to try out the concept of sending self-routing drones to fly to the scene first. That could bring about several possible benefits: Since they're airborne, drones would likely be able to arrive on scene faster than a police officer. With an aerial view, they could capture video evidence to help authorities find the person who fired the weapon. And in the case of a false alarm — there have been reports of sensors interpreting fireworks and backfiring cars as gunshots — the drones might be able to keep an officer from responding to nothing.

It's an idea that came out of need. According to Chris Seidt, Louisville's director of information technology, Mayor Greg Fischer tasked the city's Office of Performance Improvement and Innovation — which Seidt was in before moving to his current position — with finding outside-the-box solutions to some urgent problems.

Gun violence was a big one. According to LouieStat, the city's statistics portal, Louisville saw shootings more than double from 228 in 2014 to 460 in 2016. They fell in 2017, but around that time the city was installing ShotSpotter. The new system gave officials an indication that there was still a lot of shooting to worry about.

"In its first six months of existence, we had 800 activations of the system," Seidt said. "In the 400 square miles of Jefferson County, that's a bit of a problem."

Another bad statistic for the city: Its clearance rate, or the rate at which homicide cases end in an arrest, is about 50 percent. That's below the national average.

We thought, 'What's the likelihood of getting a better clearance rate if we get to the site of a gunshot incident quickly?'" Seidt said.

There's another reason, unrelated to crime, behind the project: Like most cities, Louisville still needs to learn about how people are going to use drones in the future.

"We think drones being integrated into urban environments is something the city needs to be involved with, so by taking the lead on this ... program, we feel like we can have a say on how the drone ecosystem in our city develops," he said.

HOW IT WOULD WORK

The pilot, if approved, is likely to be limited in scope to start off with. The city would be looking for a few parts of town without a lot of flight path obstructions or restrictions, and it

would set up geofencing to limit the drones to those parts of town. It would need to purchase new autonomous drones; the fire department already uses manual drones under more restricted conditions, but those wouldn't suit the needs of the project.

"Our goal is to test the theory and see if this is an effective use case of the technology," Seidt said. "We're not looking to go immediately into production and deploy hundreds of drones across the community."

The drones would probably have video cameras, which would turn on the moment they launch to respond to a gunshot report and stay on until they return, and maybe equipment to detect heat signatures at night. They would have manual control for emergencies, but mostly they would rely on software to guide them — at predetermined elevations — to the location of gunshots.

And the drones wouldn't follow people, cars or other objects. That capability exists within autonomous drones, but for now Seidt said it's not part of the city's plans. Remote operators would have the ability to maneuver the cameras in order to capture more footage of something.

From ShotSpotter's perspective, the idea is pretty straightforward.

"We send an XML digital alert to a system that can ingest it, and then the heavy lifting is done by an (unmanned aerial vehicle) system that can take a specific lat and long from our system and then do the ... work to get a drone to get from wherever it takes off to that alert," said Ralph Clark, chief executive officer of ShotSpotter.

Clark said he's only heard of one other group that wanted to use autonomous drones to respond to ShotSpotter, and that was in South Africa where a customer wanted to use them to try to catch rhino poachers. While the idea of using drones to respond to ShotSpotter is new in the U.S. — none of the sources interviewed for this story had heard of similar programs — the idea of people using technology to respond to the system is not. According to Clark, some of the company's customers have hooked the system up to surveillance cameras that are able to pan, tilt and zoom to focus on the location of a gunshot.

PRIVACY, RACE AND THE FUTURE

Jay Stanley, a senior policy analyst for the American Civil Liberties Union, said he has some concerns about the program. One in particular is the possibility that such programs could, if they spread, lead to police disproportionately targeting communities of color. That's been a problem in the past with policing across the country — as Stanley pointed out, whites and African Americans consume marijuana at about the same rates but African Americans are arrested for it far more often.

"Some cities have only put ShotSpotter in poor and minority neighborhoods," he said.

That's been an issue with other types of technology, too. Predictive policing methods have, in the past, taken their data from previous crime figures. Since police were already doing more in low-income and minority neighborhoods, some have accused predictive policing algorithms of flagging those neighborhoods as needing more police.

That said, officials from ShotSpotter and Louisville have both argued that the drone program might actually help protect citizen privacy relative to other surveillance options. After all, the proposal is to only send out drones when there's a report of a gunshot. If the city were to try to use immobile cameras for the same purpose, they would need to blanket the landscape with them.

In that regard, Stanley agrees.

“I agree in the abstract. If it’s an either-or choice, I’d prefer to have surveillance in places with suspected gunshots than everywhere all the time,” he said.

But he’s skeptical it would actually work out that way.

“If this (idea) were to take off, we’d probably have both,” Stanley said.

Gunshot sensors aren’t the only type of automated data-gathering networks cities are building. The Array of Things project coming out of Chicago is testing the idea that cities can collect all kinds of data — foot traffic, air quality, rain levels, etc. — in order to improve their operations. Premise Data, a startup that uses crowdsourcing to gather information, is starting to make a push into the U.S. And computer vision algorithms are giving more cameras the ability to identify objects and events. Conceivably, these could all act as automatic data feeds to trigger some kind of response from local government.

The purpose of the FAA’s program is to learn about how cities might be able to use drones in ways they haven’t before. So Louisville’s program, being probably the first of its kind, could set an example for other cities to do similar things in the future.

“They’re looking not only to validate the safety ... I think they’re trying to drive innovation in many use cases for drones and how those can impact the economy,” Seidt said.

Seidt expects the FAA to announce in May which pilot projects it will approve.

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The system may also help authorities retrieve more ammo casings for a national network of ballistic evidence that’s used to solve crimes, said ATF spokeswoman Mary Markos.

The system is similar to another gunshot detection program called ShotSpotter that cities can pay to subscribe to; however, the FireFLY won’t cost the city, Black said.

ShotSpotter is in use in more than 90 cities across the country, including New York City, Chicago and Denver.

The California-based company’s website boasts of dramatic decreases in gunfire and increases in gun-related arrests in areas that use the system.

Denver Channel 7 reported in April that since Denver police began using ShotSpotter in early 2015 it has lead to 102 arrests and the recovery of more than 80 guns.

ShotSpotter’s two-year contract with the city is worth nearly \$2 million, according to Channel 7.

But critics have questioned whether the ShotSpotter system can actually help police catch or deter more criminals.

Some communities have discontinued the program amid concerns related to its cost and effectiveness, according to multiple media reports.

A 2016 Forbes Magazine analysis of data from seven participating cities found that police were unable to find evidence of gunshots 30 to 70 percent of the time after ShotSpotter alerts.

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