

CNA Spotlight

Using Technology to Address Violent Crime

The Arlington, Texas Police Department's Unmanned Aerial Systems Programs

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Photos: Arlington, Texas Police Department

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Introduction

The Arlington, Texas Police Department



This report is part of a series of reports highlighting innovative programs that have been implemented in some of the most progressive police agencies across the country. These reports will highlight some of the nation's most innovative best practices in violent crime reduction; focused deterrence; approaches to gun violence; officer safety and wellness; community and public safety partnerships; and the use of technology, intelligence, and analytics to reduce violent crime. Each of these reports provides a background on the program, details the important components of the program and the agency's approach, highlights the successes the agency has experienced as a result, and identifies ways other agencies can employ similar programs.

The following report highlights the Arlington, Texas Police Department's Unmanned Aerial Systems Program. CNA worked closely with the Arlington Police Department to develop this publication, including site visits in June 2018 to observe and speak with participants about the initiative.

The Arlington Police Department (APD) has more than 600 sworn personnel and is led by Chief Will Johnson. Since his appointment in 2013, Chief Johnson has refocused the APD's mission: today's APD strives to increase legitimacy and reduce violent crime by building trust in the community through transparent action, positive engagement through leveraging technology, geographic

policing, and employee development. Johnson has made numerous strides toward increased transparency, enhanced community outreach efforts, renewed training efforts focused on procedural justice, and numerous public safety and community outreach efforts. Most recently, the APD has renewed an emphasis on reducing violent crime by combating illegal guns and drugs and targeting known offenders. The APD has begun using unmanned aerial systems (UAS), or drones, as one approach to combat violent crime challenges such as barricaded-person incidents, police pursuits, and missing child searches.¹

1. Roberto Villasenor and D. Rodriguez, *Safer Neighborhoods through Precision Policing Initiative: Arlington, Texas, Police Department* (Arlington, VA: CNA, 2019).

UAS Responses to Violent Crime

In 2011, the City of Arlington hosted the Super Bowl, which provided an opportunity for the APD to deploy its first UAS for research and observation. Like a police helicopter, this technology provides officers with “eyes in the sky” —only more maneuverable and operating at lower altitudes. A UAS can travel into dense areas where traffic accessibility is limited, or that are unsafe for officers and the public. Law enforcement agencies have used UASs to monitor crowds during large public events, survey homeless encampments, and photograph crash scenes from the air.²



Arlington Police Department Aviation Team photo taken by an unmanned aerial system.

2. Jeff Brown, “Taking to the Air: Drones and Law Enforcement,” *Dover Post*, December 13, 2017, <http://www.doverpost.com/news/20171213/taking-to-air-drones-and-law-enforcement>.



◀ **Lepton Avenger drone circa 2012.**



◀ **DJI Mavi Pro drone used by the Arlington Police Department's Aviation Team in 2019.**

Pilots typically operate UAS aircraft using a remote tied to an iPad or similar device. UAS operators must adhere to strict regulations set out by the Federal Aviation Administration (FAA). These regulations include keeping the UAS in sight throughout the flight, flying no higher than 400 feet in the air, and acknowledging additional restrictions if they are operating near an airport or military installation.³ The FAA's rules are technical, not procedural—it does not regulate how states and cities can use UASs in search and seizure, so long as they are operated according to regulations.⁴

Following the success of its initial 2011 deployment, the APD began expanding its UAS fleet—a project that continues today. The department currently has nine officer pilots who can deploy UAS technology when necessary. The APD has deployed UASs to assist with K9 searches, missing persons investigations, search and rescue, and security for community events. Its most common types of deployment have been documenting crash and crime scenes, assisting in foot pursuits, executing high-risk search warrants, and

assisting in barricaded-person incidents. Each deployment helps the APD achieve its goals of preventing and reducing crime and increasing officer and public safety.⁵

The department's UASs are designed to be operated by a single officer pilot. Each UAS can search an area of up to 4.3 square miles and can stay airborne for 27 minutes in both day and night flights. Each unit is equipped with three batteries, which can extend the flight time by an additional 27 minutes with each battery change. The devices' cameras offer 4K-resolution video recordings. Each UAS is compact enough to be stored in patrol vehicles, allowing the APD to deploy them in minutes.

During its initial UAS implementation, the APD engaged in a public awareness campaign aimed at educating the Arlington community on the proper and legal use of UASs in policing. The campaign included tables or tents at large events (such as the Super Bowl), media releases, and town hall meetings. Additionally, the APD posted its deployment policy on its public website and encouraged the community to provide feedback and to ask questions about UAS use.

3. Federal Aviation Administration, "Unmanned Aircraft Systems Regulations and Policies," last modified December 06, 2018, <https://www.faa.gov/uas/resources/>.

4. Brown, "Taking to the Air" (see note 2).

5. Villasenor and Rodriguez, Safer Neighborhoods: Arlington (see note 1).

Agency Spotlight: Integrating UAS Technologies in the Louisville, Kentucky Metro Police Department

The Louisville Metropolitan Police Department (LMPD)'s proposed adoption of UASs to support its gunshot detection system provides a leading example of the ways UASs can integrate with existing technology systems to improve officer safety and investigations.

In 2016, violent crime in the City of Louisville peaked after a four-year increase. The LMPD began looking for new ways to address violence. After researching options, it acquired and implemented ShotSpotter, a gunshot detection system.

Gunshot detection systems use acoustic sensors to detect and triangulate gunshots. When activated by impulsive noise—the boom or bang sounds that may represent gunfire—each sensor captures a brief recording of the sound and its precise time and location. By June 2017, the LMPD had deployed this system across six square miles of the city, in the neighborhoods with the highest levels of gun violence. In the first six months of operations, there were over 1,200 unique activations, which led the LMPD to recover nearly 700 casings and 28 guns and make 16 associated arrests. In addition, once the system was fully implemented, the department's average gunshot response times decreased in the coverage areas, thanks to the system's automatically publishing information about potential incidents to dispatchers.

Despite these successes, however, when the LMPD analyzed ShotSpotter activation data in conjunction with service call data, it found that nearly 86 percent of

activations were not associated with a call for service. This lack of calls for service creates two challenges for the department: First, officers are responding to known gunfire calls with few details about the incident besides the approximate location of the gunshot sound. The lack of information makes these calls significantly riskier than responding to a service call. Second, from an investigative perspective, if no witnesses come forward, there is often no evidence associated with the scene but bullet casings. Without more consistent information on these, it is hard to arrive at a clear understanding of what gun crimes are being committed or build a case for prosecution.

To combat these challenges, the LMPD is examining the use of UASs to provide instant camera footage in the direction of the gunshot activation area to the LMPD Real-Time Crime Center. Many of the areas covered by the gunshot detection system do not have comprehensive video coverage readily available. UAS footage will provide responding officers with potentially vital information about the scene prior to their arrival and provide detectives with information about who might have been involved in the shooting. While not chosen for a Federal Aviation Administration (FAA) pilot award for this effort, the LMPD did receive \$100,000 from the Bloomberg Philanthropies' 2018 Mayors Challenge to test UASs in this capacity and will be exploring ways to implement this pilot program within the current FAA regulations. If the program is implemented, the LMPD will become the first law enforcement agency in the country to use UASs to respond to gunshots.

Sources

B. Miller, "Louisville Plans to Become First U.S. City to Use Drones to Respond to Gunshots," *Government Technology*, February 16, 2018, <http://www.govtech.com/products/Louisville-Plans-to-Become-First-US-City-to-Use-Drones-to-Respond-to-Gunshots.html>.

J. Sonka, "Louisville's Application to Fly Automated Drones to Gunshot Sites Not Among FAA Pilot Project Awardees," *Insider Louisville*, May 10, 2018, <https://insiderlouisville.com/government/louisvilles-application-to-fly-automatic-drones-to-gunshot-sites-not-among-faa-pilot-project-awardees/>.

Challenges

In implementing its UAS program, the APD had to meet all FAA requirements. Doing so required the APD to train officers in both the department's own policies and the laws on UAS deployment and operation—including the various authorities under which the department's UAS system functions. The APD's authority to deploy a UAS comes from FAA certifications of authorization (COA); the department has both a jurisdictional COA and a blanket public COA. The APD has also begun incorporating private COAs into its operations, the authority for which stems from 14 CFR Part 107, outlining the regulations that govern non-hobbyist and commercial UAS operations. In any given operation, the APD can choose to operate under its jurisdictional public COA, blanket COA (nationwide Class-G airspace), or Part 107. Each authority has its benefits, and APD decides which authority to use before each flight.

The APD initially experienced some negative feedback from the community about its use of UASs; however, since the department's public awareness campaign, it has enjoyed community support for its use of UASs in police operations. Thus far, no private UAS deployments have affected APD UAS operations.

Successes

The APD has conducted 62 operational deployments since the full implementation of the new UAS model in September 2017. These flights have successfully documented

crime scenes and evidence for court, provided intelligence in barricaded-person situations, provided support to the APD's Crimes against Children Unit in locating victims, and shortened the time of crime scene documentation and mapping. UAS usage has increased officer safety in potentially dangerous situations, such as barricaded-person incidents, by providing officers with the necessary information to conduct a safe operation without sending in an officer. For example, the APD piloted a UAS into a building where a person was barricaded to obtain important

Table 1. Arlington UAS deployments by category

| Flight category | Number of deployments |
|--|------------------------------|
| Crime in progress (foot pursuit, suspect search, roof search, etc.) | 30 |
| Barricaded person | 5 |
| Search warrant | 10 |
| Missing child | 2 |
| Crime scene documentation | 12 |
| Administrative (security site survey) | 1 |
| Target hardening (special event) | 2 |

information. Other access technology, such as the department robot, was unable to enter the facility. The APD has deployed its UASs to assist other jurisdictions as well. For example, the APD assisted a neighboring jurisdiction with gathering intelligence on a barricaded person in a high-rise apartment building. The APD piloted a UAS to the balcony of the apartment; from that vantage point, the UAS video indicated that it was safe for officers to enter the apartment without using force.

Moving Forward

In response to the success of its UAS program, the APD plans to increase deployments. The department's first autonomous aircraft was deployed only 10 times because of the model's size; pilot officers needed to stand a considerable distance away during launch for safety. Since obtaining its new smaller and lighter UAS model, the APD deploys UASs approximately 8 to 11 times per month and plans to expand both the number of deployments and the types of calls for which UASs are deployed, such as fire rescue calls and missing person calls. The APD would also like to include a UAS technology specialist in its program; this specialist would receive training in thermography, datacasting, and other skill sets. The department is also

researching the use of counter-UAS recognition and mapping software that will allow the department to quickly disrupt an adversary's UAS control in a way that minimizes risk of collateral damage and risk to public safety. Previously, military units would shoot adversary UASs out of the sky, which poses a serious risk to public safety. While there is no single technological countermeasure to prevent unauthorized UAS encounters, the integration of this technology with sustained outreach and education improves the likelihood of countering unauthorized UAS use with minimal risk. The use of UASs presents an opportunity for the APD to use technology to support the officers in the field, increase situational awareness, and increase officer safety.



The Arlington Citizen's Police Academy donating funds to help support the Arlington Police Department's Aviation Unit.

Lessons for Other Agencies

The APD offers the following recommendations to agencies considering a UAS program:

- **Understand your reasons for implementing a UAS program and identify the program’s goals.** Agencies must identify the needs of a UAS program to ensure successful program implementation. In turn, this will help identify which model and type of UAS the agency should purchase.
- **Find a peer agency that already has a UAS program in place.** This will help expedite and improve UAS program development and implementation. Agencies can borrow language on policy and the COA process from an experienced agency.
- **Create an “elevator speech” about police UAS usage.** This will help to assuage any doubts that the agency or the community may have about UASs. Also consider developing a public awareness campaign and encouraging community residents to ask questions and voice concerns about the new program.
- **Be mindful of relying solely on Florida v. Riley (1989) for legal support of UAS use in the community.** *Florida v. Riley* states that police officials do not need a warrant to observe an individual’s property from a public airspace.⁶ This court decision may be overturned in the future, so it is important to justify the need for a UAS program with other evidence.
- **Carefully evaluate and consider which UAS model is most appropriate for the agency.** Ensure that the size, features, and capabilities of the UAS meet agency needs.

The APD stresses the importance of being methodical in meeting the FAA and COA requirements, and in properly educating the community on UAS use in policing.

6. *Florida v. Riley*, 488 U.S. 445 (1989).

About CNA

CNA is a not-for-profit organization based in Arlington, Virginia. The organization pioneered the field of operations research and analysis 75 years ago and, today, applies its efforts to a broad range of national security, defense, and public interest issues, including education, homeland security, public health, and criminal justice. CNA applies a multidisciplinary, field-based approach to helping decision-makers develop sound policies, make better-informed decisions, and lead more effectively.

The Arlington (Texas) Police Department deploys Unmanned Aerial Systems (UAS) to document crime scenes, execute search warrants, and assist in search and rescue, community event security, and barricaded-person incidents. This Spotlight report describes some of the legal and technological requirements for implementing a UAS program—as well as some of the public relations challenges the Arlington program faced.

This series of Spotlights highlights innovative programs implemented in progressive police agencies across the country. These reports showcase best practices in violent crime reduction; focused deterrence; approaches to gun violence; officer safety and wellness; community and public safety partnerships; and the use of technology, intelligence, and analytics to reduce violent crime.



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