

Drones as First Responders

Tom Christoff and Quin Patterson





Abstract

This white paper offers essential background and insights for law enforcement agencies exploring drone integration. What was once a primarily military technology has evolved to provide significant civilian benefits, including improving search and rescue operations, scene management, tactical information gathering, suspect tracking, and traffic management. However, implementing drone programs incurs substantial financial costs for equipment, maintenance, and personnel. Agencies must also navigate a complex legal landscape, adhering to Federal Aviation Administration regulations and state laws while addressing ongoing constitutional debates regarding privacy and the Fourth Amendment. Furthermore, ethical considerations related to First Amendment rights, data management, and the potential for weaponization, are crucial. In this paper, we stress the importance of developing robust policies, ensuring data security, and engaging with the community to guide responsible and effective drone operations.

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A handwritten signature in black ink, appearing to read 'D. Kaufman', is placed next to the 'Approved by:' text.

David Kaufman, Vice President and Director
Safety and Security Division
CNA, Institute for Public Research

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Introduction

The use of drones by hobbyists and professionals alike has steadily grown in recent years, with 822,039 drones registered with the Federal Aviation Administration (FAA) as of July 2025 (Federal Aviation Administration, n.d.). What was once considered military technology is now used daily by civilians throughout the United States. Over the past decade, law enforcement agencies across the nation have also begun exploring drones' capacity to aid in calls for service, help find lost persons, track suspects, and document evidence at a scene. In large part, this increase in drone use is because of the wide range of tools and software with which a drone can be equipped, including optical cameras (4K, visual, thermal, hyperspectral), light detection and ranging, radio frequency identification sensors, Wi-Fi sensors, microphones, biometric sensors, Global Positioning System (GPS), and odor detectors. These tools provide law enforcement with a substantial range of information, including imagery (visual, thermal, infrared), audio, telemetry, location, identity, and behavioral information.

Because drones are a relatively new tool for law enforcement, a basic understanding of them is necessary for any agency considering drone use. Within this document, we discuss critical topics surrounding drones in law enforcement—including their history, financial costs, benefits, legal and ethical factors, and policy implications—to provide background and insights for law enforcement agencies in their pursuit of drones as a tool for first response.

Throughout this document, we use the term *drones* but recognize that many names are used for these devices, including uncrewed aerial vehicles, uncrewed aerial systems, and remotely piloted aircraft systems. We define *drones* as aircraft that operate without an onboard pilot, instead being controlled remotely or autonomously through sophisticated software. Drones can be either multirotor (e.g., quadcopters) or fixed wing. However, we refer primarily to multirotor drones; they are the type that is most commonly used in law enforcement because they can be deployed anywhere and can hover and ascend and descend vertically.

History of Drone Use in the Military

Before being used by law enforcement agencies, drones were historically used in military operations, significantly shaping modern warfare and intelligence operations. The use of drones began during World War I, when Ruston, Proctor & Co. leveraged technology patented by Nikola Tesla to develop the Aerial Target (Figure 1), a radio-controlled drone used to train anti-aircraft gunners and the first known radio-controlled uncrewed aerial aircraft (Candolfi, 2024).

From the 1980s through the 1990s, military drone technology saw further advancements, including the French-manufactured Sperwer drone, which was primarily employed for surveillance and observation. This era also featured expanded drone use during the Gulf War (Konaszczuk & Nogalski, 2024).

Since the year 2000 (and particularly in the period following the September 11, 2001, terrorist attacks), the use of drones as a military weapon has increased as part of the Authorization for Use of Military Force, which was adopted by the US Congress after 9/11 and provided the basis for the United States' use of drones to target terrorists in places such as Afghanistan and Pakistan (Konaszczuk & Nogalski, 2024). This drone growth in US combat capability is largely considered the most significant of any weapon system in recent decades.

Since drones' inception, their military capabilities have substantially increased, particularly in their usefulness for intelligence, surveillance, and reconnaissance missions (Çaska & Gayretli, 2016). Drone designs allow the military to equip them with a wide range of surveillance technology, including high-powered lenses, GPS, automated object detection, and gigapixel cameras. In addition to being used for surveillance, military drones are also crucial for projectile launching, targeted munition delivery, and lethal strikes (Sabino et al., 2022). More recent efforts have focused on developing uncrewed combat aerial vehicles (Figure 2), with designers aiming to create autonomous, highly agile multirole fighters capable of air-to-air combat and targeted munition delivery (Chowdhary et al., 2014). Military operations can also

Figure 1. Aerial Target



Source: Imperial War Museum.

leverage cooperative surveillance across multiple drones (swarms), which can enhance efficiency and coverage (Konaszczuk & Nogalski, 2024).

Furthermore, technological advancements have varying degrees of autonomy possible in military drones; some drones can now operate with full autonomy using onboard software and autopilot assistance (Issoufou Anaroua, 2021).

Figure 2. MQ-9A Reaper uncrewed combat aerial vehicle



Source: General Atomics Aeronautical Systems, Inc.

History of Drone Use in Law Enforcement

From these military origins, drones have become increasingly integrated into civilian law enforcement and public safety (Dafinova et al., 2019; Sabino et al., 2022). Based on the existing literature, the first use of drones by law enforcement occurred in July 2005, when the Hays County Sheriff's Office in Texas asked a retired Air Force medic, Gene Robinson, to use his custom-designed drone to help locate a missing schoolteacher (Axon Enterprise, n.d.; Cardenas, 2018). Although the use of the drone did not lead to an initial identification of the missing woman, a retrospective review of the photographs taken by the drone indicated that investigators would have located the body had they known what to look for in the photos. The lessons from the 2005 experience paved the way for drone use in missing person searches nationwide.

The first time a drone was used in an enforcement capacity came in 2011, when law enforcement officers in Grand Forks, North Dakota, used a Predator drone (Figure 3), on loan from the US Department of Homeland Security's Customs and Border Protection, to assist in the location and apprehension of Rodney Brossart. This was the first use of drones in the arrest of a United States citizen (Sheehan, 2013).

Although drones offer law enforcement agencies a new tool for public safety, the widespread use of drones by police departments in the United States was initially constrained by FAA restrictions.

Figure 3. MQ-1 Predator drone



Source: US Air Force Reserve Command.

The FAA typically required agencies to obtain a Certificate of Waiver or Authorization and ensure that operators were licensed pilots (Heen et al., 2018). This bureaucratic hurdle slowed widespread adoption. However, in August 2016, the FAA introduced less restrictive regulations specifically for public safety users, including law enforcement agencies (see the Legal Framework section for more information about FAA regulations for drones in law enforcement). As a result, by May 2018, an estimated 580 municipal and county law enforcement agencies had drones; by March 2020, this number had increased to 1,029, a 77 percent increase in just two years (Gettinger, 2018, 2020).

Although many agencies incorporate drones in some capacity, others have more recently developed formal drone programs, including drones as first responder (DFR) programs. Pioneered by the Chula Vista Police Department (CVPD, in California) in 2018, DFR programs deploy a drone in response to calls for service (Figure 4). Sending drones allows the department to live stream visuals of emergency before officers arrive, to enhance situational assessment and decision-making and mitigate potential hazards (Davies & Krame, 2023). In DFR programs, first responders place drones strategically within a city. Upon receiving a call for service, a certified pilot launches and controls the drone to respond to the scene (in some instances, the drone launch and flight can be conducted autonomously). The drone transmits video back to the pilot, who can relay the information to other responding officers (National Urban Security Technology Laboratory, 2025). In addition, as part of a DFR program, agencies may place drones in patrol vehicles, allowing officers to deploy them from the field as needed. DFR programs are a relatively new approach for incorporating drones as part of a standard law enforcement response and represent an area for practitioners and scholars to explore moving forward.

Figure 4. Chula Vista Police Department drone as first responder



Source: Chula Vista Police Department.

Costs of Using Drones

When implementing a drone program, law enforcement agencies need to consider the startup and ongoing costs of equipment and maintenance, as well as other indirect costs. The adoption and agencywide integration of drones can come with considerable costs. For instance, the initial cost of purchasing drones and their specialized equipment ranges from \$1,000 to \$30,000 (Grepow, 2024). If an agency desires software or capabilities not included in the original drone purchase, those would naturally require additional financial resources. Hardware maintenance brings further costs, such as repair costs if a drone is damaged during flight and administrative storage costs for the data collected by the drones. As one example of a department's potential investment, a publicly available 2024 report from the Beverly Hills (CA) Police Department (BHPD) reveals that the department has 25 drones and that BHPD incurred initial costs of \$114,811 and maintenance costs of \$48,800 across five years (the lifespan for each drone listed in the report) (Beverly Hills Police Department, 2024).

Beyond hardware costs, departments must consider personnel costs associated with developing program policies, training drone control personnel and pilots (as well as training patrol members on the broader program), and executing auditing processes. Agencies with fully established drone programs also incur administrative costs associated with integrated air traffic management systems and infrastructure, such as takeoff and landing stations. Regardless of the specific drones being used and their operational functions, agencies seeking to employ drones in any capacity should plan for the costs of purchasing and maintaining the devices and operating their drone programs.

Benefits of Using Drones

The use of drones within law enforcement, although still in its infancy, has shown promise of unique benefits to officers and other first responders. Drones offer a unique aerial view for real-time monitoring of ground activities, and their advantages over traditional crewed aircraft (such as helicopters and airplanes) include smaller size, lower production costs, less conspicuous operation, and longer operational times without human fatigue (Constantinescu & Nedelcut, 2011; Dafinova et al., 2019; Hildmann & Kovacs, 2019). Although law enforcement agencies are constantly finding new and innovative ways to use drones in operations, the benefits of drones are often discussed in the context of their use in search and rescue operations, scene management and evidence collection, tactical information gathering, suspect location and tracking, and traffic management (Davies & Krame, 2023; Heen et al., 2018). In the following sections, we discuss each of these beneficial ways that law enforcement can use drones.

Search and rescue operations

As discussed in the History of Drone Use in Law Enforcement section, drones were first used to help search for missing persons, and this continues to be a primary function of drones today. Drones are often used in search and rescue events to locate lost or missing persons because of their ability to cover large areas quickly and provide a situational overview and because of their low cost and ease of operation (Davies & Krame, 2023; Saulnier & Thompson, 2016).

Although empirical analysis of drone response is scant, initial indications are that drones can reduce the time taken to locate a lost person or body (Eyerma et al., 2018). Drones can also be equipped with person-locating tools that can assist in the search (including biometric sensors, odor detectors, and visual, thermal, infrared, and multispectral cameras), enhancing their potential for search and rescue operations (Constantinescu & Nedelcut, 2011; Dafinova et al., 2019).

Relatedly, drones can serve as a specialized tool for finding individuals after natural disasters. For instance, Measure and the American Red Cross (2015) provide several common use cases in disaster relief, including reconnaissance and mapping; structural assessment; temporary infrastructure and supply delivery; wildfire detection and extinguishment; high-rise building fire response; chemical, biological, radiological, nuclear, or explosive event response; search and rescue operation; insurance claims response and risk assessment; and logistics support. For instance, rather than relying on the limited information that can be gathered by ground vehicles, authorities can use drone-based mapping in postdisaster situations to assess the full

scope of the damage, including that to critical infrastructure (Hildmann & Kovacs, 2019). Drones can also mitigate risk to first responders in disaster scenarios by limiting their exposure to danger and equipping them with the information needed to form a more focused response (Hildmann & Kovacs, 2019). Similarly, drones can assist in response to wildfires and forest fires by combining observations of current damage with weather monitoring, specifically wind and atmospheric forecasts (Hildmann & Kovacs, 2019). Overall, in natural disasters, drones offer another tool for gathering the information needed to make critical decisions in pressing situations.

Scene management and evidence collection

Drones offer substantive benefits for managing crime or accident scenes and collecting evidence for future use. For example, crime scene photography by drones can provide a more comprehensive view of a scene (including multiple angles) than traditional methods (Heen et al., 2018; Wenguang & Zhiming, 2021).

Drones can also process and form three-dimensional data on scene, with accuracy to the centimeter level, providing a detailed and precise view of a scene that can be preserved for use in the courtroom (Chen et al., 2024; Wenguang & Zhiming, 2021). Similarly, drones can be used for reconstructing traffic accidents by providing information immediately after the accident, including the vehicles involved, damage recorded, and the status of persons involved. This information can be used to determine how the accident began and who may be the guilty party (Constantinescu & Nedelcut, 2011; Dafinova et al., 2019).

Tactical information gathering

Drones offer specific tactical advantages by providing an “eye in the sky” view that helps to enhance situational awareness during high-risk incidents. Having real-time eyes on a critical event can help law enforcement better identify, track, and assess targets and threats, limiting the factors that can result in injury to both the subject and the officers. For instance, drones can help law enforcement identify threats from a greater physical distance, reducing exposure to the threat and allowing officers to approach cautiously (Davies & Krame, 2023; Enemark, 2021).

Similarly, drones can be deployed to hostage, barricade, or active shooter events to conduct aerial surveys and keep officers safe by maintaining a view of safe areas and tracking through tight urban areas (Constantinescu & Nedelcut, 2011; Dafinova et al., 2019; Hildmann & Kovacs, 2019). Drones can also be combined with other police technologies, such as body-worn cameras and artificial intelligence, to provide improved real-time situational awareness by

combining ground-level and aerial views that agencies can use for real-time decision-making (Davies & Krame, 2023). Furthermore, information gathered by drones may preclude the need for a physical response, removing the potential for physical harm to officers and negating the potential need for coercive force against the subject. For instance, drones can arrive at an event first and help determine whether a true threat exists, relaying the information to dispatchers and law enforcement, who may decide not to send any other type of law enforcement response. Finally, in addition to information gathering, drones can assist in information transmission by serving as a radio transmitter or internet hot spot (Hildmann & Kovacs, 2019).

Suspect location and tracking

Drones can also be used for suspect pursuit and apprehension purposes by helping to find fleeing or hiding suspects (Davies & Krame, 2023; Heen et al., 2018). For instance, the CVPD used a drone to track a suspect evading officers, capturing video of the suspect throwing a gun away and hiding a bag of contraband (Enemark, 2021). Given their infrared and biometric detection capacities, drones can also locate hiding suspects more quickly than can members of law enforcement performing a manual search. Furthermore, drones can provide law enforcement with the option to follow an offender to a more tactically advantageous arrest location (e.g., during a public disorder event), resulting in a safer resolution for officers and community members alike. As part of narcotics investigations, drones also offer a surreptitious option for tracking offenders and gathering intelligence after an arranged buy, such as data about the location where the money is being taken.

Traffic management

Drones can also be used for traffic management because they can monitor driving areas (such as highways, streets, and crossroads) and provide traffic information to law enforcement (Constantinescu & Nedelcut, 2011; Dafinova et al., 2019). For instance, as part of planning for a targeted enforcement operation, drones can help law enforcement agencies identify areas with high rates of speeding or other moving violations (such as disregarding a red light), helping agencies take an informed approach to traffic safety (Dafinova et al., 2019). Drones can also hover above busy intersections to provide information for patrol officers or ambulances from the air, allowing them to avoid bottlenecks when responding to a scene or driving to the nearest medical facility. Drones also have the potential to be used to block intersections during high-speed pursuits, preventing serious accidents with uninvolved motorists (Constantinescu & Nedelcut, 2011).

Legal Framework

The use of drones in the United States is governed by the FAA, which sets the criteria for individuals operating small drones (fewer than 55 pounds) in Title 14, Chapter 1, Subchapter F, Part 107 of the Code of Federal Regulations. As written, Part 107 imposes several constraints on drone flights that affect a law enforcement agency's ability to incorporate drones into its operations: drone operators must maintain visual sight of the drone, drones cannot fly over people, and drones cannot fly at night (Federal Aviation Administration, 2020). However, the FAA can provide law enforcement agencies waivers for these regulations and has increased the frequency with which it provides such waivers in recent years. Law enforcement agencies can also apply for a Part 91 Certificate of Waiver. Whereas Part 107 regulates the individual, Part 91 regulates the program and requires a more comprehensive application and review process (Osantowski, 2018). For instance, agencies applying for a Part 91 Certificate of Waiver must demonstrate how their pilots will be trained and certified, how they will use their drones, what their processes and procedures for accessing and navigating airspace will be, and what risk mitigation strategies they will institute (Federal Aviation Administration, 2025a). In recent years, this process has been expedited for law enforcement agencies, but the scope of the review means that it still takes longer than the process to obtain a Part 107 waiver. Overall, law enforcement agencies (as well as other public safety organizations, such as fire departments) should review the public safety toolkit provided by the FAA to understand the steps needed to achieve and maintain compliance with federal law when implementing a drone program (Federal Aviation Administration, 2025b).

Law enforcement agencies need to ensure that their drone programs adhere not only to federal law, but also to state law. However, state laws vary regarding how drones can be operated, with some states placing no limitations on drone use in law enforcement and other states and municipalities setting strict standards through legislation. For instance, legislation varies widely across jurisdictions regarding using drones for random surveillance and crowd control, equipping drones with less-than-lethal weaponization and armor, using drones near correctional facilities, and equipping drones with facial recognition capabilities (Lexipol Content Development Team, 2024). To give one example, Illinois' Freedom from Drone Surveillance Act explicitly prohibits the use of law enforcement drones except in 10 specific circumstances, including "when the agency obtains a search warrant, when engaged in a search and rescue operation (and not a criminal investigation), and in certain limited ways during a routed or special event like a parade or food festival" (Office of the Illinois Attorney General, 2025). Each law enforcement agency will therefore need to coordinate with its local, county, and state officials to identify the rules and laws under which it will operate its drone program.

Constitutionality

As with any new technology, considerable debate exists about how privacy and civil liberties will be preserved by law enforcement agencies with drone programs (Cavoukian, 2012; Schlag, 2013; Stanley & Crump, 2011), particularly as the ability of drones to gather information (including biometric information) goes beyond the capabilities of traditional methods (Dafinova et al., 2019). Indeed, given the relative infancy of drone technology, modern case law is still navigating how best to evaluate the use of drones from a constitutional standpoint. For example, whether the use of drones constitutes a search under the Fourth Amendment in the same manner as other technologies is a debated topic (Blitz et al., 2015; Dafinova et al., 2019; Thompson, 2012). Although some comparative Fourth Amendment case law can be found regarding other technologies, no case provides direct guidelines for the constitutional use of drones (Harvard Law Review, 2025). For example, whether the same rulings that apply to other technologies for aerial monitoring (California v. Ciraolo, 1986; Florida v. Riley, 1989) and tracking (United States v. Jones, 2012) will also apply to drones is unclear, despite drones' ability to perform similar tasks (Dafinova et al., 2019; Harvard Law Review, 2025).

Ethical Considerations

Regardless of drones' constitutionality, there is also the question of how a democratic society wishes to be ethically policed via drones when engaging in lawful activity. For example, many Americans participate in a variety of assemblies and associations protected by the First Amendment. However, law enforcement use of drones to monitor and gather a wide range of information about those activities may create a stifling effect on participants, even if it does not technically violate their rights (Dafinova et al., 2019; Enemark, 2021). Similarly, privacy advocates have raised concerns about how data and information gathered from drones (including photographs and other identifying information) are stored, shared, or otherwise used, particularly when an individual has committed no crime (Cavoukian, 2012; Olivito, 2013; Watney, 2022).

Perhaps no issue touches on the ethical implications of drones more than the potential for them to be equipped with a weapon, including both lethal and nonlethal weapons (Enemark, 2021). Currently, drones cannot be affixed with lethal weapons, in accordance with the 2018 FAA Reauthorization Act, Section 363. However, drones can be manufactured with the potential for deploying tasers, pepper spray, paintballs, and rubber munitions (Enemark, 2021). These less lethal munitions are not covered under the FAA Reauthorization Act and are therefore regulated at the state or local level, where the rules vary. For instance, in 2015, North Dakota became the first US state to permit police to use drones armed with "nonlethal" weapons (An Act to Provide for Limitations on the Use of an Unmanned Aerial Vehicle for Surveillance, 2015), whereas other states have explicitly prohibited any drone weaponization (Lexipol Content Development Team, 2024). As the debate on drone weaponization continues, decision-makers should consider the significant psychological effects of drone force events for both the subject and the drone operator. For example, the recipient of force may be traumatized by the sensation that Big Brother policing has arrived; drone operators, meanwhile, may experience moral disengagement and dehumanize others if they use these tactics too frequently (Stelmack, 2014).

Policy Development and Best Practices

As with any new technology, agencies with a drone program should ensure that robust policies and safeguards are developed to regulate and guide drone use on the streets. Although our review found no specific model policies for drones, several best practices and policy standards do exist that agencies should be sure to incorporate into their policy manuals (International Association of Chiefs of Police Aviation Committee, 2012; Lexipol Content Development Team, 2024; PowerDMS, 2020). For example, drone policies should discuss the location of the program within the broader organizational structure as well as the reporting chain within the program. Policies should also clearly describe situations in which drones are authorized and unauthorized to reflect local, state, and federal laws regulating drone use, as well as community expectations for deploying drones and safeguarding privacy (see following section for more discussion on incorporating community members in developing and maintaining a drone program). In addition, policies should discuss required certifications and training not only for drone operators but also for the whole department, to ensure that all officers are familiar with the program and its goals.

In addition to these elements, a comprehensive drone policy should set clear standards for data collection and data retention. Although other agency policies may be related to data management, drone programs will naturally collect unique data, such as flight logs, that may not be reflected in other data policies. Drones also have the potential to collect large volumes of data, which may come with substantial storage costs that agencies should consider before establishing their drone response program. Policies should discuss annual reporting requirements and protocols that demonstrate ongoing oversight of the drone program and the data it collects. For instance, the drone policy of the Albany Police Department in Oregon requires an annual report that uses flight logs to discuss the frequency of drone use and the purposes for which the drones were used (Albany Police Department, 2023). The policy also requires the annual report to include information on how community members can access the department's drone policies and procedures.

Agency policies should reflect sufficient data security protocols. Depending on the specific software and functions, drones can collect and transmit an array of data, including drone telemetry (range, height, speed, battery status), audio or electronic communications, location, personal identifiers, and behavioral information. To protect these data, agencies should have protocols to prevent remote interception and compromise by malicious actors (e.g., drone hackers), who can disrupt law enforcement operations or even hijack the drones. For example, communications and stored data should be encrypted to prevent unauthorized access, particularly when using cloud-based storage options. The Criminal Justice Information Service

Security Policy Version 6.0 sets minimum security requirements for data storage, and many drone options available for law enforcement come with encryption software. However, law enforcement agencies should ensure that their procedures are also consistent with state or local laws and the privacy expectations of the community.

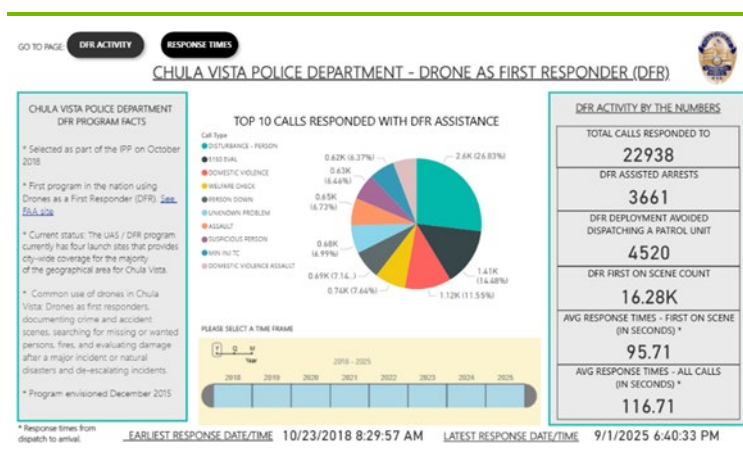
As a final security measure, law enforcement agencies should conduct routine audits to ensure that only authorized individuals access drone data and that flight logs have been completed for any mission. The focus of these audits should be verifying that all elements of the program are being used appropriately. For instance, the Charleston County Sheriff's Office drone policy requires quarterly auditing to "ensure that only authorized users are accessing the data for legitimate and authorized purposes" (Charleston County Sheriff's Office, 2025). Given the public interest in maintaining privacy with drone use, the results of these audits should be publicly posted.

Finally, as with any policy or new technology, guidelines for drones should ultimately be informed by those who will be subjected to the technology: the community (Christoff et al., 2024). Attitudes vary about the use of drones (Heen et al., 2018), so agencies should ensure that frameworks regarding drone use are developed in a way that does not affect trust with the community. For instance, research by Heen et al. (2018) found higher support for using drones to perform reactive tasks (e.g., search and rescue missions) and lower support for using drones to perform proactive tasks (e.g., crowd monitoring).

Furthermore, preexisting personal perceptions of law enforcement can affect how much individuals will accept the use of drones (Bradford et al., 2020; Haunschild & Reuter, 2021; Heen et al., 2018; Hobson et al., 2023), so agencies should engage with a wide audience to ensure that they are reliably considering all viewpoints. Moreover, the policy should identify how the agency plans to keep community members

informed about the drone program. For instance, the CVPD uses a public-facing dashboard to provide information on its drone program, including the most common types of calls for which drones are used, the total number of calls for which drones were deployed, drone response times, and other performance metrics (Figure 5). Finally, agencies should develop a policy

Figure 5. Chula Vista Police Department Drone Dashboard



Source: Chula Vista Police Department.

review schedule, allowing community members a regularly scheduled opportunity to suggest revisions to the DFR program's policy.

Conclusion

The use of drones in law enforcement is expanding, and the field is constantly identifying new ways to use the technology to respond to service calls. Drones were first used to help identify missing persons, but their use has now evolved to include assistance in a variety of situations, such as scene management and evidence collection, tactical information gathering, suspect location and tracking, and traffic management (among other uses). Additionally, through the development of formal programs like DFR, drones have gone from being used in ad hoc deployments to now being a formal part of response-to-service protocols. As happens with the incorporation of any new technology, the criminal justice field is still evaluating the costs and benefits of using drones, though it is clear that their potential can be a net benefit to law enforcement as a result of the tools with which they can be equipped. However, the constitutional and ethical frameworks for using drones, as well as how these frameworks should be incorporated when creating robust policy, continue to be topics of a developing conversation within the field. These conversations will no doubt continue as drone use becomes more common, though the future remains bright for this emerging technology.

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