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Drones & Police Departments:

Usage, Law, Issues, and Recommendations

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Report

Presented to the Faculty of the Graduate School

Of the University of Texas at Austin

In Partial Fulfillment

of the requirements

for the Degree of

Master of Public Affairs

The University of Texas at Austin

May 2020

Drones & Police Departments:

Usage, Law, Issues, and Recommendations

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The report investigates the current capabilities and use cases for drones deployed by police departments in the United States and makes recommendations on their use. I use data published by the Bard College Center for the Study of the Drone, Muckrock, and news articles to establish an estimate of the current number and type of drones used by American police departments and how they are used. I investigate the current constitutional, federal, state, and local restrictions on the use of drones, finding that police departments may use them at their discretion unless circumscribed by state or local law. Finally, I provide recommendations as to how police departments should use drones according to use case.

Table of Contents

List of Tables

List of Figures

Executive Summary

This Professional Report investigates the extent of and manner of use of unmanned aircraft by American police departments. It discusses the current regulations on the use of police drones at the constitutional, federal, state, local, and departmental level. There is then an overview of the kinds of drones used, their prevalence in the United States, and a discussion of the various use cases in which they are deployed. This report concludes with recommendations for police departments focusing on practical and constitutional considerations.

This report was researched using publicly available information. Data on the numbers of police departments using drones and the exact models in use comes from a report published by the Bard College Center for the Study of the Drone.

Chapter 1: Unnamed Aircraft - Federal, State, Local, and Departmental Regulation

Federal

Unmanned Aerial Systems (UAS), also referred to as Unmanned Aircraft (UA), or drones are regulated at the federal level by the Federal Aviation Administration. The most recent iteration of federal rules for drones is the 2012 FAA Modernization and Reform Act[1]. Sections 331 and 336 require the FAA to integrate civil small unmanned aerial vehicles into the national system of air traffic control, including police drones.

The current version of the rules regulating drones were published in 2016[2]. All operators of drones weighing less than 55 pounds must follow the rules in the table below unless they obtain a Part 107 Waiver.

[1] "H.R. 658 (112th): FAA Modernization and Reform Act of 2012." *GovTrack.us*, www.govtrack.us/congress/bills/112/hr658/text.
[2] Federal Aviation Administration, "Final Rule: RIN 2120–AJ60.", 2016., https://www.faa.gov/uas/media/RIN_2120-AJ60_Clean_Signed.pdf.

Table 1 FAA Drone Regulations

Operational Limitations	• Unmanned aircraft must weigh less than 55 lbs. (25 kg). • Visual line-of-sight (VLOS) only; the unmanned aircraft must remain within VLOS of the remote pilot in command and the person manipulating the flight controls of the small UAS. Alternatively, the unmanned aircraft must remain within VLOS of the visual observer. • At all times the small unmanned aircraft must remain close enough to the remote pilot in command and the person manipulating the flight controls of the small UAS for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses. • Small unmanned aircraft may not operate over any persons not directly participating in the operation, not under a covered structure, and not inside a covered stationary vehicle. • Daylight-only operations, or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time) with appropriate anti-collision lighting. • Must yield right of way to other aircraft. • May use visual observer (VO) but not required. • First-person view cameras cannot satisfy the "see-and-avoid" requirement but can be used if the requirement is satisfied in other ways. • Maximum groundspeed of 100 mph (87 knots). • Maximum altitude of 400 feet above ground level (AGL) or, if higher than 400 feet AGL, remain within 400 feet of a structure. • Minimum weather visibility of 3 miles from control station. • Operations in Class B, C, D and E airspace are allowed with the required ATC permission. • Operations in Class G airspace are allowed without ATC permission. • No person may act as a remote pilot in command or VO for more than one unmanned aircraft operation at one time. • No operations from a moving aircraft.

Table 1: continued

Operational Limitations	• No operations from a moving vehicle unless the operation is over a sparsely populated area. • No careless or reckless operations. • No carriage of hazardous materials. • Requires preflight inspection by the remote pilot in command. • A person may not operate a small unmanned aircraft if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of a small UAS. • Foreign-registered small unmanned aircraft can operate under part 107 if they satisfy the requirements of part 375. • External load operations are allowed if the object being carried by the unmanned aircraft is securely attached and does not adversely affect the flight characteristics or controllability of the aircraft. • Transportation of property for compensation or hire allowed provided that the aircraft, including its attached systems, payload and cargo weigh less than 55 pounds total; • The flight is conducted within visual line of sight and not from a moving vehicle or aircraft; and 12 • The flight occurs wholly within the bounds of a State and does not involve transport between (1) Hawaii and another place in Hawaii through airspace outside Hawaii; (2) the District of Columbia and another place in the District of Columbia; or (3) a territory or possession of the United States and another place in the same territory or possession. • Most of the restrictions discussed above are waivable if the applicant demonstrates that his or her operation can safely be conducted under the terms of a certificate of waiver.

Applicants for Part 107 Waivers are required to provide information on who will be piloting the drone, exactly which of the above operation limitations are to be waived, how and where the drone would be flown, and the make and model of the drone. As a result of numerous open records requests the FAA decided to make public summary information on every Part 107 waiver issued.

Several federal programs support the integration of drones into public safety, including several police departments used as examples in this report. The most significant of these programs is the Unmanned Aircraft Systems Integration Pilot Program[3]. This program selected ten governments willing to work on the edge of drone deployment in a variety of areas such as food delivery, smart cities, package delivery, and public safety. Participating cities receive expedited approval from the FAA for Part 107 Waivers and support from the FAA and US Department of Transportation.

State

The states have taken divergent approaches to the regulation of police drones. According to the National Conference of State Legislatures, as of 2017 twenty-six states have passed laws regarding drones and privacy. I conducted my own research and found one more. These states are: Alaska, Arkansas, California, Florida, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky[4], Louisiana, Maine, Michigan, Mississippi, Montana, Nevada, New Jersey, North Carolina, North Dakota, Oregon, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, and Wisconsin[5]. However, the exact restrictions and exemptions vary widely between states and the state of legislation is evolving rapidly. As of March 2020 Hawaii,[6] and Nebraska[7] are considering legislation to require warrants to use drones for surveillance.

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[3] "Unmanned Aircraft Systems Integration Pilot Program Selectees." *US Department of Transportation*, United States Department of Transportation, 15 May 2018, www.transportation.gov/connections/unmanned-aircraft-systems-integration-pilot-program-selectees-0

[4] "Kentucky HB22: 2018: Regular Session." *LegiScan*, legiscan.com/KY/text/HB22/2018.

[5] *2017 Unmanned Aircraft Systems(UAS) State Legislation Update*, 17 Jan. 2018, www.ncsl.org/research/transportation/2017-unmanned-aircraft-systems-uas-state-legislation-update.aspx.

[6] Hawaii SB 2160, https://www.capitol.hawaii.gov/session2018/bills/SB2160_.htm

[7] Nebraska LB 693, https://nebraskalegislature.gov/FloorDocs/105/PDF/Intro/LB693.pdf

A common state regulation is to prohibit police departments from using drones for surveillance without a warrant. California, for example, prohibits police departments from using drones without a warrant except in the case of emergencies, traffic accidents, or if the use is unrelated to gathering criminal intelligence[8]. On the other end of the spectrum, appropriately, is Texas. HB 912[9] of the 83rd Session of the Texas Legislature permits police departments to use drones as part of the execution of a valid search warrant but does not prohibit their use without one. The Texas law also allows drones to be used in the pursuit of any person any officer "reasonably suspects" of having committed a crime.

Another trend has been state preemption local regulations on the use of drones. The National Conferences of State Legislatures reports that fifteen states have passed laws to specifically preempt local drone regulation[10]. Their report suggests that state preemption laws tend to establish statewide regulations of drones and limit the scope of municipal drone regulations to municipal property and nuisance ordinances. For example, in Texas HB 1643[11] of the 85th Legislative session prohibits municipalities from regulating drones except ordinances pertaining to special events (football games, festivals, concerts) and municipal property.

Municipal and county ordinances typically establish fines for violations of federal or state requirements of drone operation. For example, the city of Austin has ordinances that establish fines for reckless operation or operation over a crowd. In this case, the behavior is illegal according to federal law with the FAA as the enforcing agency. However, the FAA does not enforce its drone rules. Instead it asks police departments to submit reports on behavior in violation of federal code, at which point the FAA decides whether to open their own investigation[12]. Usually infractions are so minor relative to the FAA's primary interest, commercial passenger aircraft, that the FAA does not want to get involved.

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[8] California AB 1327, 2013, "Unmanned Aircraft Systems", http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201320140AB1327&search_keywords=drone%23%23null%23%23%23null%23%23%23null%23%23%23null%23%23%23null

[9] Texas HB 912, 2013, https://lrl.texas.gov/scanned/83ccrs/hb0912.pdf

[10] *2017 Unmanned Aircraft Systems(UAS) State Legislation Update*, 17 Jan. 2018, www.ncsl.org/research/transportation/2017-unmanned-aircraft-systems-uas-state-legislation-update.aspx.

[11] Texas HB 1643, 2017, https://www.capitol.state.tx.us/tlodocs/85R/billtext/pdf/HB01643F.pdf#navpanes=0

[12] Sherman, Christopher V. "Drone Rules and Regulations for Austin, Texas Area Pilots." *Over Austin*, overaustin.com/dronerules/.

Departmental

Underneath federal, state, and local regulations police departments establish internal rules to govern themselves. Two Californian police departments, the Los Angeles Police Department and the Chula Vista Police Department, have published their internal rules. These two cases show that even though the two cities exist underneath the same state and federal legal framework, they can implement radically different drone programs.

The LAPD's Small Unmanned Aerial Pilot Program Deployment Guidelines and Procedures[13] prohibits the use of drones unless it falls into one of the following categories:

- Barricaded Suspects;
- Active Shooter Incidents;
- Assessments of Explosive Devices and Explosions;
- Hostage Situations;
- Natural Disasters;
- Hazardous Materials Incidents;
- Search and Rescue Operations; and
- Perimeter Searches of Armed Suspects with Superior Firepower, an Extraordinary Tactical Advantage, or Who are Wanted for Assault with a Firearm Against a Police Officer.

The LAPD guidelines additionally prohibit the use of armed drones and drones used in conjunction with facial recognition software. In summary, the LAPD has elected to only use drones when human life is presently at risk. Furthermore, the use of drones must be authorized by a Commander ranked officer in the Office of Special Operations.

On the other end of the spectrum is Chula Vista, a wealthy suburban city just south of San Diego with a population of about 250,000. The city has implemented a program it refers to as "Drones as First Responder"[14]. The CVPD has positioned drones on the roof of the police department and

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[13] Los Angeles Police Department Small Unmanned Aerial System Pilot Program Deployment Guidelines and Procedures. LAPD, assets.lapdonline.org/assets/pdf/2017.10.17 - APPROVED FINAL - UAS Guidelines.pdf.
[14] *UAS Drone Program.* City of Chula Vista, www.chulavistaca.gov/departments/police-department/programs/uas-drone-program.

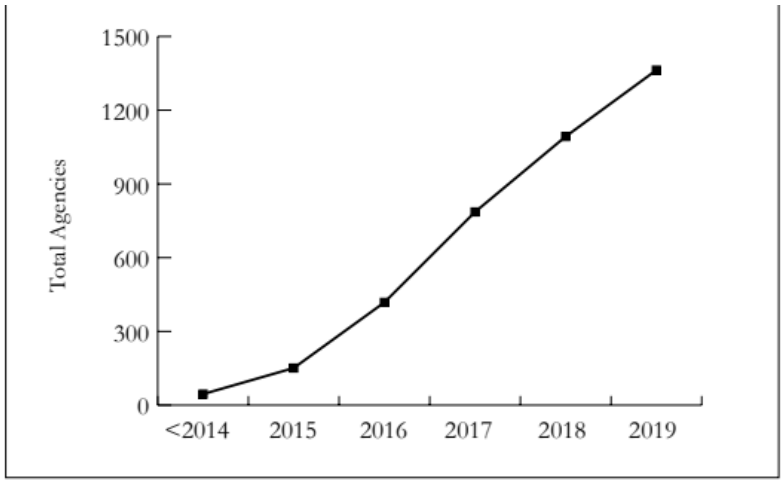
the local hospital and deploys them routinely. These drones are controlled by teleoperators within the CVPD HQ using live feeds from the drone's cameras. The teleoperators listen to live 911 calls and at their discretion decide when to launch a drone. The only activities the Chula Vista drone program prohibits are general surveillance and aerial drone patrols.

Chapter 2: Drone Abilities and Prevalence

The number of police departments using drones has skyrocketed in recent years. The Bard College Center for the Study of the Drone has been studying the issue and has published data sets in 2013 and in March of 2020. Their data is primarily based on the work of citizen journalists and researchers, FAA records, and open records requests.

Their data shows police agencies rapidly adopting drones, with an estimated 1,578 state and local public safety agencies having acquired them[15]. This statistic includes police and sheriff's departments, fire departments, state police, university police, and emergency management agencies. This count is likely incomplete. The Electronic Frontier Foundation's research found that some police departments use drones without filing a waiver. This can occur when the police department borrows the drone from another agency that has a Part 107 Waiver, the drone is operated on behalf of the police department by another government agency with a Part 107 Waiver, or the police department neglects to file for the Part 107 Waiver.

Figure 1 Police Agencies with Drones Over Time



Most of these drones are small consumer grade camera drones. The predominant manufacturer is DJI, a Chinese firm that manufactures a range of consumer and prosumer camera drones. The second most prevalent manufacturer is Yuneec, another Chinese firm. Curiously, no large

[15] Gettinger, Dan. *Public Safety Drones, 3rd Edition*. Bard College Center for the Study of the Drone, Mar. 2020, dronecenter.bard.edu/files/2020/04/CSD-Public-Safety-Drones-3rd-edition.pdf.

American military drone manufacturers, such as General Atomics, General Dynamics, Lockheed Martin, or Boeing feature on the Drone Center's list of public safety drone models.

Table 2 Drone Models at Public Safety Agencies

Manufacturer	Model	Agency Count*
DJI	Phantom	336
DJI	Inspire	291
DJI	Mavic	246
DJI	Matrice	226
Yuneec	Typhoon	34
Physical Sciences	InstantEye	17
Autel	X-Star Premium	12
Yuneec	H520	12
Draganfly Innovations	Draganflyer	11
Autel	Evo	9

The Drone Center also provides a list of the drone models used by police departments. They are predominantly small battery powered copter-craft with a range between 20 minutes to an hour. They are the same kind of drones used by hobbyists for racing, photography, and other forms of recreation. Most of the drones on the list above cost between $100 and $2,000. As price increases so does the capacity of the battery and the quality of the sensor equipment on board.

Figure 2 A DJI drone equipped with LiDAR

As price climbs towards and above $10,000, drones start to become larger and capable of

carrying advanced sensor equipment such as LIDAR[16], RADAR, surveying sensors, and other powerful systems.

[16] *LiDAR Equipped UAVs*, DJI, 12 Sept. 2019, enterprise.dji.com/news/detail/how-lidar-is-revolutionizing-mapping-and-geospatial-data.

Chapter 3: Drone Use Cases

This report attempts to describe all the major use cases for police drones. For each use case the report describes a scenario in which it might be used and then highlights relevant practical, legal, and other considerations. All the use cases described can be implemented with small consumer drones described in the previous section.

Use Case: Traffic Enforcement

The traffic enforcement use case for drones has a continuum of implementations ranging from improving the efficiency of the current process, to full automation. On the improvement end are the French, on the automation end are the Israelis.

In the French case a drone hovers above a roadway. It streams live footage to the police HQ where it is visually analyzed by a human officer. When the human officer observes illegal behavior, a chaser vehicle down the road is directed to pull over the offending vehicle to issue a citation[17]. The drone-assisted process allowed a single officer to pull over 15 to 20 vehicles an hour. While the French police did not state how many citations were typically issued without the drone in an hour, they stated the drone program issued much more.

In the Israeli use case, a drone hovers above a roadway. It streams the footage to servers in which a software program uses machine learning to identify speeding vehicles. The software system then automatically sends a citation to the owner of the offending vehicle[18].

Let's break down the elements of these use cases. Is it constitutional to use an automated camera to collect evidence? The answer is yes and there is precedent from ground-based photo enforcement systems such as red light and speed cameras used in many states. Constitutional arguments against photo enforcement systems have been broadly unsuccessful[19]. The police

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[17] Laurenson, John. "France Is Using Drones to Catch Dangerous Drivers." *France Is Using Drones to Catch Dangerous Drivers*, Marketplace, 29 Apr. 2019, www.marketplace.org/2017/11/13/world/france-drones/.
[18] Halavy, Dror. "Police to Use Drones to Monitor Speeders, Other Violators." *Hamodia*, 11 July 2018, hamodia.com/2018/07/11/police-use-drones-monitor-speeders-violators/.
[19] McNaughton, Paul. "Photo Enforcement Programs: Are They Permissible Under the United States Constitution?" John Marshall Law Review 43.2 (2010)

have a broad and rational public safety interest to cite traffic violations. However, let us go through the arguments against photo enforcement systems.

One argument against the constitutionality of photo enforcement hinges upon whether drone recordings are *prima facie* evidence or an accusatory report that implicates the 6th Amendment Confrontation Clause. This dispute is based on one's interpretation of Supreme Court case *Melendez-Diaz v. Massachusetts*[20]. In that case the Supreme Court ruled that it was unconstitutional for the prosecution to submit evidence of chemical tests identifying substances found on the defendant as cocaine without providing the testimony of the person who conducted the test. Massachusetts law at the time held that the record of the test could be introduced as evidence *prima facie*, meaning that test record was considered a fact not requiring corroborating evidence or testimony. The Supreme Court rejected this argument and affirmed that accusatory reports implied the Confrontation Cause and granted the defendant the right to cross examine the author of the accusatory report.

The specific question of whether photo enforcement systems generate *prima facie* evidence, or an accusatory report has never been directly tested. However, a close reading of the relevant Supreme Court opinions suggests that even if photo enforcements systems, including drones, do generate accusatory reports they are still constitutional. What determines if photo enforcement system evidence may be used as the basis for a civil or criminal penalty is whether that evidence can be authenticated.

At its core, there is no real difference between a human officer with a radar gun and a drone holding a radar gun. When a motorist is issued a speeding ticket, they can contest it by making the argument that the speed radar's margin of error implies that they were not necessarily speeding. Whether drone-produced evidence of a traffic infraction is *prima facie* evidence, or an accusatory report is irrelevant so long as the police department has a scientific way to prove that the drone measured the infraction accurately[21]. This leaves me with the conclusion that drone traffic enforcement programs are constitutionally permissible.

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[20] *Melendez-Diaz v. Massachusetts*. Oyez, www.oyez.org/cases/2008/07-591.
[21] Strong, Graham. Interview. Conducted by David Drew, 9 March 2020.

However, this report judges that public opinion is the more important consideration. In 2019, Texas Governor Greg Abbot signed HB 1631 that bans the use of red-light cameras for the purposes of producing evidence to issue civil or criminal penalties. Unless a federal law specifically allows police departments to use them, states are free to ban photo enforcement and by extension drone traffic enforcement. According to the Governors Highway Safety Organization, nine states as well as Washington DC and the US Virgin Islands permit speed cameras in some form, while thirteen states prohibit them[22]. Voters in Texas rebelled against red light cameras despite wide agreement that speeding through red lights is extremely dangerous to oneself and those around you. In the testimony for HB 1631, Police Commissioners argued that the purpose of red-light cameras was to modify driver behavior by creating a certainty that violators would be ticketed. They produced study after study showing that hundreds of people had not died in Texas due to red light cameras changing driver behavior[23][24]. Still, HB 1631 passed.

In the Israeli use case, it is possible to issue a citation to every vehicle speeding on a roadway. Imagine any police department places such a traffic citation drone above an Interstate Highway during the early afternoon and issues a speeding ticket to all vehicles speeding five miles per hour over the limit. The drone would certainly change driver behavior and would just as certainly trigger enough voter outrage to propel legislation banning the practice.

Use Case: Crime Scene Investigation

Drones can be used to automate a significant portion of crime scene investigation, particularly serious crashes. Normally a crash scene is investigated by a team of human investigators with specialized survey equipment. They block off the area around the crash and use the survey equipment to take measurements and photographs that are later used to make a scientific judgement as to what occurred. This survey process can take up to three hours, during which traffic slows and the investigators are at risk of serious injury or death from passing vehicles.

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[22] *Speed and Red Light Cameras*. Governors Highway Safety Association, www.ghsa.org/index.php/state-laws/issues/speed and red light cameras.
[23] Texas, House Research Organization, *Bill Analysis HB 1631*, 2019.
[24] *House Transportation Hearing - March 26th, 2019*, https://tlchouse.granicus.com/MediaPlayer.php?view_id=44&clip_id=16784.

What this manual process produces can range from a hand drawn sketch to a digital representation. This process is expensive in manpower, training, equipment, and time. A drone can replace all of it[25].

An example is the City of Austin's use of drones to investigate serious traffic accidents[26]. According to the Austin American Statesman, the drone spends about 15 minutes creating a 3-D rendering of the crash site using photogrammetry and completely replaces the human surveying process. Austin Police Department Lt. Blake Johnson gave three reasons for supporting the program; it eliminated the risk of investigators being hit by passing vehicles, it's much faster, and the 3-D model is better than was created with prior methods. Drone manufacturers would also argue that this use case[27]:

Figure 3 An Example of Photogrammetry

- Reduces training, maintenance, and purchase costs related to crime scene investigation equipment;
- Provides evidence of such high quality that it reduces trial times; and
- Improves the local economy by reducing the duration of lane closures related to traffic accidents.

[25] Pix4D. *4 Reasons Drones Will Revolutionize Accident Scene Response*. Medium, 26 May 2016, medium.com/the-science-of-drone-mapping/4-reasons-drones-will-revolutionize-accident-scene-response-a1db234eeccf.
[26] Wilson, Mark. *Austin Police Launch Drone Program for Deadly Traffic Crashes*. Austin American-Statesman, 26 Sept. 2018, www.statesman.com/NEWS/20180825/Austin-police-launch-drone-program-for-deadly-traffic-crashes.
[27] *Using Drones in Forensic Mapping. A Microdrones Podcast*. Microdrones, www.microdrones.com/en/content/using-drones-in-forensic-mapping-a-microdrones-podcast/.

Looking forward, industry representatives suggested that future drones could become so small and cheap that every patrol car could be equipped with one. In that scenario, a patrol officer at any crime scene could deploy the drone to autonomously create a comprehensive 3-D model and send the file to investigators. This would be especially useful in rural areas where crime scene investigators would need to drive for hours to reach the crime scene.

It is important to note here that the camera on the drone does not need to be especially powerful. Photogrammetry, the key technology that enables this use case, works with budget smartphone cameras. It is primarily a software tool applied to the data digital cameras collect, although more powerful cameras allow for more detailed models.

Use Case: Search and Rescue

Using drones in search and rescue operations both replaces and adds to the role of helicopters and fixed wing aircraft. In addition to providing an aerial view, drones can fly below a forest canopy and cover ground far faster than on foot. In Maryland, a search for a missing man went on four days. A volunteer with a hobby drone was able to find the man in minutes[28].

This use case is especially important when considering the relative operational costs of a helicopter and small drones. Helicopters cost millions of dollars to purchase and hundreds of dollars and hour to operate, while drones cost a few thousand dollars to purchase and pennies an hour to operate.

Use Case: Reconnoitering

Drones can be used to carry out reconnaissance in a situation where a human police officer performing that role would be at risk of serious injury or death. An example of this use case comes from an incident in Los Angeles[29][30]. An LA SWAT team wanted to arrest a man for

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[28] Knezevich, Alison. *'A Balancing Act': Maryland Police Drones Aid in Searches, Crash Investigations, but Raise Privacy Concerns*. Baltimore Sun, 15 Nov. 2019, www.baltimoresun.com/maryland/howard/bs-md-police-drones-20191115-wmhapy5ihnaknesjolxhhip5zq-story.html.
[29] Chang, Cindy. *LAPD Deploys Controversial Drone for the First Time*. Los Angeles Times, 16 Jan. 2019, www.latimes.com/local/lanow/la-me-lapd-drone-20190115-story.html.
[30] "LAPD Drone Video from Standoff." LAPD, 8 Sept. 2019, https://www.youtube.com/watch?v=Ap_Ax7_229E&feature=emb_logo.

armed robbery they believed to be hidden in an apartment. A SWAT officer piloted a DJI Spark around the building, looking for the suspect. The drone confirmed that the man was not in the apartment, allowing the SWAT team to safely enter.

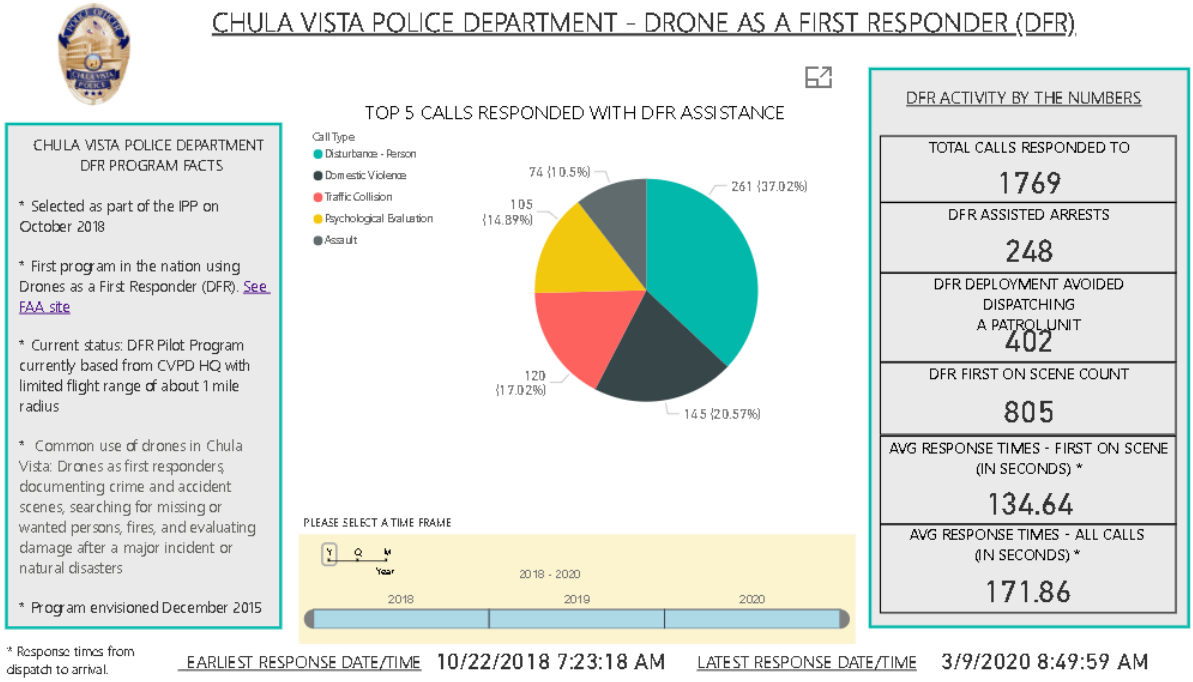
This use case also applies when officers serve a warrant. In a situation where officers might be concerned for their safety or a suspect might flee, a drone with an aerial view could provide essential information.

Use Case: Drones as First Responders

This use case involves using drones' mobility to arrive at the scene of emergencies and 911 calls well before human officers. This implementation gives officers information as to what is occurring as they approach. The non-drone analogy would be sending a manned helicopter to provide aerial support on most or every 911 call.

Chula Vista seems to be the one and only example of this use case. Their enthusiasm for drones is such that the police department provides real time records on the activities of their drone as a first responder program. Chula Vista PD has claimed that this program has resulted in a sharp drop in robberies and other crimes in the city.

Figure 4 The Chula Vista PD Drone Dashboard



Use Case: Hazardous Materials

Figure 5 Aeryon SkyRanger Drone

Drones can be used to remove humans from harm when inspecting a potentially hazardous substance or device. In the scenario that a device might be a bomb, a small expendable drone can approach to allow a close visual inspection. For example, the San Diego Fire Department's Bomb Squad received a grant from the FAA to acquire an Aeryon SkyRanger drone[31]. Considering most bomb threats are false alarms, drones could prove useful in quickly and safely evaluating potential threats.

[31] Riggins, Alex. *San Diego's Bomb Squad Adds Drones to Its Toolbox*. Government Technology, www.govtech.com/public-safety/San-Diegos-Bomb-Squad-Adds-Drones-to-Its-Toolbox.html.

Use Case: Surveillance

Surveillance is the most controversial use case for police drones. There are ethical, legal, and practical concerns to consider. This report will go through a series of existing and hypothetical implementations of police drone surveillance programs and discuss the concerns with each.

The first scenario I would like to suggest is the most limited implementation. Let's say the police know an area is regularly victimized by package thieves. The police dispatch a drone to surveil this area. At some point, the drone observes a person stealing a package. The drone pilot dispatches the police, who arrest the thief.

This use case likely does not bring up any constitutional issues. Neighborhood roads are almost always public property implying no reasonable expectation of privacy. Furthermore, because no person was surveilled this use case can be thought of as no different from a human patrol officer happening by a crime in progress. However, if the area surveilled could not be scientifically justified there could be concerns about discrimination analogous to concerns about predictive policing.

Let's imagine an escalation of this use case. The police believe a specific person is a package thief. They dispatch a drone to follow this person's movements in public. Eventually, the drone observes that person stealing a package. The video is used as evidence to arrest the thief.

This use case fits neatly into precedent established in *United States v. Knotts*[32]. In that case Minnesota law enforcement used a tracking device placed inside a chloroform bottle to follow Knotts on public roads to a cabin. The police then obtained a warrant and searched the cabin, discovering a meth lab. In that case the Supreme Court ruled unanimously that the tracking device had not compromised Knotts' Fourth Amendment protections against unreasonable search and seizure because there is no expectation of privacy on public streets. Furthermore, surveillance of a person, regardless of method, does not violate the Fourth Amendment so long as the surveillance takes place from a public area. In his majority ruling Justice Rehnquist stated "We have never equated police efficiency with unconstitutionality, and we decline to do so

[32] United States v. Knotts, 460 U.S. 276 (1983)

now"[33]. It then appears the *United States v. Knotts* specifically indicates the above use case is constitutional.

A third permutation of our initial surveillance use case is that the drone must follow a specific person, exclusively in public spaces, for weeks or even months before it observes a crime. This specific question has not been ruled on by the Supreme Court, but it was debated in oral arguments for *United States v. Jones*.

In *United States v. Jones,* the government appealed a decision by the DC District Court to uphold the suppression of GPS tracking data collected by a device installed on Jones' wife's Jeep. The Supreme Court upheld the lower court's ruling because the police had installed the device after the warrant to do so had expired. This meant that the installation of the GPS tracker was trespass, and the evidence resulting from it had been properly suppressed.

However, during oral arguments the duration of the surveillance question was brought up directly. In oral arguments, Justice Scalia stated that if the surveillance was constitutional for one minute, it would be constitutional for an hour or any greater length of time[34]. This assertion is a defining characteristic 4th Amendment jurisprudence[35].

Considering the standard established by *United States v. Knotts* that there is no expectation of privacy for anything a person shows to the public. This leads me to conclude that **it is constitutional for the police to use drones to surveil any individual for an indefinite period if they are observed from a public place, with or without a warrant**. To further emphasize this point, I refer back to oral arguments in *United States v Jones*, in which Justice Alito stated that "In the pre-internet age most of the privacy that people enjoyed was not the result of legal protections or constitutional protections; it was simply the difficulty of traveling around and gathering up information."[36]

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33 United States v. Knotts. Oyez, www.oyez.org/cases/1982/81-1802.
[34] *United States v. Jones*. Oyez, www.oyez.org/cases/2011/10-1259
[35] For an explanation see the article by Roberts in the literature review.
[36] See oral arguments in *United States v. Jones* at 7:45.

With the constitutional limit described above in mind the question must be raised when might unmanned aircraft surveillance cross a constitutional line? There are two Supreme Court cases that provide some outer bounds, *Florida v. Riley* and *Dow Chemical Company v. United States*.

In *Florida v. Riley*[37] a police deputy overflew Riley's property in a helicopter, which allowed him to visually identify marijuana plants on the property. The Court held that Riley had no reasonable expectation of privacy because anyone could view Riley's property from a helicopter flying in public and legally navigable airspace.

This implies that police drones may overfly private property if they are within legally navigable airspace and do not interfere with the property. It then seems that the FAA, by granting Part 107 Waivers to police departments, expands the navigable airspace in which police drones may constitutionally operate. This directly reduces the areas in which there are reasonable expectations of privacy.

Dow Chemical Company v. United States[38] puts another limit on how drones may operate. In that case Dow Chemical denied the EPA's request to inspect a facility. In response, the EPA conducted an aerial inspection with a manned aircraft. The Supreme Court ruled 5-4 that the government is not required to obtain a warrant before conducting aerial searches of outdoor areas with generally available equipment. This seems to expand the *Florida v. Riley* standard to permit the police to use commonly available equipment to augment their senses during an aerial search from public airspace.

This brings up a secondary question, what is commonly available equipment? The limit of this was found in *Kyllo v. United States*[39]. In that case the police used an infrared camera, which measures radiant heat, to discern that many heat lamps were in operation inside Kyllo's house. This was the basis to obtain a warrant that was used to search the home and find marijuana cultivation. The Supreme Court ruled, in 2001, that Kyllo had a reasonable expectation of privacy because infrared cameras were not in general use and without them it would have been impossible to discern the presence of the glow lamps without physical intrusion. The actual

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[37] *Florida v. Riley*. Oyez, www.oyez.org/cases/1988/87-764
[38] *Dow Chemical Company v. United States*. Oyez, www.oyez.org/cases/1985/84-1259
[39] *Kyllo v. United States*. Oyez, www.oyez.org/cases/2000/99-8508

implications of this case are a matter of debate for legal scholars. It might mean that the police may use any commonly available sensor equipment, which would today include infrared cameras. It might alternatively mean that any sensor that intrudes on the level of privacy granted at the time the 4th Amendment was written is disallowed. We cannot know for certain until this precise question is tested in the Supreme Court.

This brings up the final surveillance use case, wide-area surveillance. Surveilling a large area over an extended period creates a database of information that could be searched after crimes occur. For example, someone commits a murder that is caught on camera by a wide-area surveillance program. There is too much data to process as it comes in, but as the murder is investigated an investigator could search the surveillance database at the time and place of the murder and identify those involved. The database could be an immensely valuable investigatory tool.

The city of Baltimore implemented such a city-wide surveillance program using manned planes. Their program recorded the movements of all persons and vehicles in an area over a period of hours. During a single flight the Baltimore system captured five homicides on video and the system produced evidence that was used in hundreds of prosecutions[40]. Such a system could today be efficiently built with drones.

The precedents established in *United States v. Knotts* and *Florida v. Riley* suggests such a drone system would not violate anyone's reasonable expectations of privacy, whether they were on a public street outdoors on their own private property. This implies that it is constitutional for the police to create a system of wide area continuous surveillance. All the drone does is make such a system practically feasible.

However, such a system could raise concerns of residents in areas so surveilled. The Baltimore program was highly controversial. The ACLU has filed suit seeking to stop it. As of the writing of this report, that suit is ongoing[41]. On a different note, existing consumer drones do not have

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[40] Powers, Benjamin. *Eyes Over Baltimore: How Police Use Military Tech to Secretly Track You*. Rolling Stone, 25 June 2018, www.rollingstone.com/culture/culture-features/eyes-over-baltimore-how-police-use-military-technology-to-secretly-track-you-126885/.

[41] *ACLU Challenges Pilot Aerial Surveillance Program in Baltimore*. American Civil Liberties Union, 9 Apr. 2020, www.aclu.org/press-releases/aclu-challenges-pilot-aerial-surveillance-program-baltimore.

the battery capacity or sensor equipment to perform this role beyond small areas, such as a single city block. Wide area surveillance would likely require large fixed wing drones. A wide area surveillance program would also require sophisticated data storage and processing capabilities which are likely out of the realm of possibility for police departments outside of major metropolitan areas.

Use Case: Event Overwatch

Police are commonly deployed to large gatherings such as farmer's markets, sports events, political rallies, and parades. This use case would involve deploying drones above the event to provide additional security and awareness. This role is commonly performed by a helicopter. Helicopters are orders of magnitude more expensive to operate than drones but provide an identical role in this use case. Manned helicopters are very expensive to purchase and maintain[42]. Especially in rural departments, drones could provide lifesaving abilities that would otherwise be impossible to purchase.

Use Case: Armed Drones

The final use case discussed in this report is armed drones. A potential scenario would be incapacitating a suspect fleeing on foot[43] or an armed suspect barricaded inside a house. The state of North Dakota, has passed a law that allows police drones to be equipped with less-than-lethal weapons, including guns firing rubber bullets, tasers, gas, and nets[44].

Armed drones carry a heavy negative connotation, especially when imagined in the hands of police departments. Armed drones are widely and increasingly used by militaries, and many scholars would view their adoption by police departments as malicious police militarization. The

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[42] Nocera, Jess. *If Howard Had Kept Its Aviation Program, Would Police Have Found the Missing Ellicott City Man Faster?* Baltimore Sun, 13 Aug. 2019, www.baltimoresun.com/maryland/howard/cng-ho-howard-police-helicopter-drone-0815-20190813-yxe765e7czfthlqkogp3eufrhe-story.html.
[43] Popular Mechanics. *SXSW 2014: CUPID Taser Drone*. YouTube, 8 July 2014, www.youtube.com/watch?v=39hFd2JuqVU.
[44] Cox Media Group National Content Desk. *North Dakota Police Can Use Weaponized Drones under New Law*. Springfield News-Sun, 23 Sept. 2016, www.springfieldnewssun.com/news/national/north-dakota-police-can-use-weaponized-drones-under-new-law/Bh6H1PgXn0soGZkfSB5xDO/.

use of drones to kill American citizens on American soil is clearly illegal, though some academics worry that this is how armed drones would be used.

However, armed drones might be necessary to address a specific scenario, other armed drones. I believe that the greatest utility an armed drone would have is countering other drones. In the scenario that a drone is armed with a bomb, the police cannot shoot down or otherwise disable the drone as it would only bring the bomb to the ground. Instead, the drone must be captured and held aloft and carried to a safe place. At present, the only system that appears to effectively deliver this solution is a drone armed with a net gun[45].

[45] Delft Dynamics BV. *DroneCatcher - Controlled Drone Interception*. YouTube, 20 Oct. 2017, https://www.youtube.com/watch?v=zepmZ574Wjw.

Chapter 4: Literature Review

Legal Academics

Only a small number of articles focus specifically on police drones. These articles sit within a broader debate about privacy, liberty and the Fourth Amendment created by ambiguity and conflicting interpretations of Supreme Court cases. Oftentimes these academic works stray far beyond the topic of police drones and foray deep into legal theories that are only tangentially relevant to this paper. The volume of academic writing on privacy rights is far beyond my ability to understand or the scope of this paper. Central to all the legal articles I provide here is the 4th Amendment of the United States Constitution. I believe it is helpful to provide it to readers now.

"The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized[46]".

The paper most directly relevant is Andrew B. Talai's *Drones and Jones: The Fourth Amendment and Police Discretion in the Digital Age*[47]. The central argument Talai makes is that the most important consideration with police drones is not privacy, but police discretion. He argues that the 4th Amendment Tests established in *Jones, Cirallo, Riley,* and *Dow Chemical* do not restrain the use of police drones for the purposes of surveillance. He believes police have so much discretion regarding how they might use drones that it could undermine the democratic relationship between citizens and government.

To make his argument Talai focuses on *Jones V. United States*. To briefly summarize, the Supreme Court ruled that the evidence supplied by a GPS tracker on Jones's wife's Jeep ought to have been suppressed because of the illegal trespass the police had engaged in to apply the GPS tracker. Talai describes this as a missed opportunity to "reevaluate existing doctrine in light of technological progress." He refers to the same point made by Justice Alito's concurring opinion

[46] U.S. CONST, amend. IV.
[47] Talai, Andrew B. "Drones and Jones: The Fourth Amendment and Police Discretion in the Digital Age." California Law Review, vol. 102, no. 3, June 2014, p. 729-[ii].

(joined by Justices Ginsburg, Breyer, and Kagan) lamenting that the Supreme Court had created a rule for a "21st century technology using 18th century tort law."[48]

Talai goes on to describe how the damage to the relationship between citizens and government might occur. He argues that drones can be used to create an efficient and unobtrusive version of Stop and Frisk, referred to hereafter as *Terry* Stops for the court case that established the judicial precedent that enabled them. Terry Stops can occur if a police officer holds reasonable suspicion that a person has or is about to commit a crime. This stop is doctrinally described as "the temporary seizure of a person."[49] In a world of limited resources, it is up to police discretion to decide who is stopped. It was the misapplication of this discretion, by way of "indirect racial profiling"[50] that led to the program's discontinuation in New York. Stop and Frisk has not been banned by federal law or Supreme Court decision. Talai suggests that drones could be abused in a similar way by subjecting certain groups to an unscientifically justified level of surveillance. He refers to the concept of the panopticon, specifically the concern that if certain groups of people come to believe they are always under surveillance, they will self-regulate their behavior in an unhealthy and undemocratic manner.

Troy Roberts in his article *On the Radar: Government Unmanned Aerial Vehicles and Their Effect on Public Privacy Interests from Fourth Amendment Jurisprudence and Legislative Policy Perspectives* addresses the same subject[51]. However, his perspective is noticeably different as it comes from the earlier eon of 2009. This is important for two reasons. Firstly, because Jones v. United States had not yet occurred, and second because at the time small quadcopter consumer drones did not yet exist. His article focuses on the police applications of large military drones such as the Predator or Global Hawk.

Roberts, like Talai, describes the debate and implications of Supreme Court cases relevant to police and drones. Like Talai, he reaches the conclusion that current constitutional law allows the

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[48] *United States v. Jones*. Oyez, www.oyez.org/cases/2011/10-1259
[49] Florida v. Rodriguez, 469 U.S. 1, 5 (1984)
[50] Goldstein, Joseph. *Judge Rejects New York's Stop-and-Frisk Policy*. The New York Times, 12 Aug. 2013, www.nytimes.com/2013/08/13/nyregion/stop-and-frisk-practice-violated-rights-judge-rules.html.
[51] Roberts, Comment, On the Radar: Government Unmanned Aerial Vehicles and Their Effect on Public Privacy Interests from Fourth Amendment Jurisprudence and Legislative Policy Perspectives, 49 Jurimetrics J. 491-518 (2009).

police to use drones to surveil any person or their home without a warrant provided the drone is in publicly navigable airspace. However, he arrives at this conclusion differently. Roberts looks to *Riley*, but focuses on the assertion made by the justices that because it is common for a plane to overfly a person's private property, a person cannot have a reasonable expectation of privacy in any area viewable from publicly navigable airspace. He argues that targeted police surveillance is fundamentally different from incidental flyovers by civilian aircraft. He cites the dissenting opinion of Justice Marshall in *Smith v Maryland*[52]. In that case the court established that one does not have a reasonable expectation of privacy in whom they call because the telephone company knows and therefore knowingly takes the risk that the phone company might provide that information to the government. *Smith* implies that all people must accept that any information they turn over to a third party might be turned over to the government, and as such have no reasonable expectation of privacy over information so provided. Robert argues that *Smith* logic extends to drones because if a private third party could observe, so too could the police.

Roberts goes on to suggest that drones, because they can navigate without visual cues, might be constitutionally required to turn off their visual sensors until they arrive at the target of their mission, whether that be the execution of warranted search, monitoring a forest fire, or otherwise. He makes this argument using Justice O'Connor's concurrence in *Riley*[53], which argued that it was unreasonable to require people to completely enclose their backyards from the air to create a reasonable expectation of privacy.

Roberts spends some time focusing on the debate around *Kyllo v. United States* and the "High Technology Doctrine." In Kyllo, the police used a thermal camera to deduce that heat lamps were active inside a house and used that information to obtain a warrant. Justice Scalia, writing for the majority, established a bright line rule that "Where...the Government uses a device that is not in general public use, to explore details of the home that would previously have been unknowable without physical intrusion, the surveillance is a 'search' and is presumptively

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[52] Smith v. Maryland, 442 U.S. 735, 744^6 (1979).
[53] "Florida v. Riley, 488 U.S. 445 (1989)." *Justicia Law*, supreme.justia.com/cases/federal/us/488/445/#tab-opinion-1957709.

unreasonable without a warrant."[54] According to Roberts, there are actually multiple interpretations of this rule.

The first is that as soon as any technology enters general public use, the police may use it to obtain whatever details they can without a warrant. Roberts argues that the intended interpretation of the Supreme Court's rule is that it is impermissible to use **any** technology to obtain information about the details of a private residence if those details would have required a trespass to discern at the time the 4th Amendment was written. Roberts states that there is no way to know which one of these is correct until the question is directly put before the Supreme Court, or the debate is decided by the passage of federal law.

Another vein in legal scholarship relevant to how police use drones is Mosaic Theory. In his article, *The Mosaic Theory of the Fourth Amendment*, Orin S. Kerr describes Mosaic Theory as the concept that even if the individual actions of police surveillance do not count as a search requiring a warrant, collectively they might[55]. This would be especially relevant to drones in the use case of long-term drone surveillance of persons in public places. Five minutes of observation might not constitute a search, but would five weeks? This theory was established in the concurring opinions on *Jones v United States*, namely those of Justice Alito[56] and Justice Sotomayor[57]. Because their lines of reasoning were not part of the Supreme Court's official opinion on the case, they can only be considered suggestions for future jurisprudence.

Kerr recommends against adopting the Mosaic Theory. He begins by describing the current methodology courts use to determine if a police action constitutes a search requiring a warrant, which Kerr calls "sequential analysis." Under sequential analysis the scenario to be analyzed is broken up into individual pieces and each is analyzed separately. Kerr provides that the act of inserting a key into a lock, opening the door, and entering a home are all considered separate actions. The court considers those separate actions and decides whether an action, in its, always or **never** constitutes a 4th Amendment search. The Mosaic Theory third option would create

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[54] Kyllo v. United States, 533 U.S. 27,29 (2001).
[55] Orin S. Kerr, The Mosaic Theory of the Fourth Amendment, 111 MICH. L. REV. 311 (2012). Available at: https://repository.law.umich.edu/mlr/vol111/iss3/1
[56] Jones, 132 S. Ct. at 963-64 (Alito, J., concurring in the judgment). Justice Alito's opinion was joined by Justices Ginsburg, Breyer, and Kagan.
[57] *United States v. Jones*. Oyez, www.oyez.org/cases/2011/10-1259

judicial pandemonium in Kerr's estimation. He believes it would be difficult or impossible to establish a set of principles that would be as clear and useful as the current standard of sequential analysis. Kerr then raises the concern that if Mosaic Theory were not effectively and quickly implemented, it would erode 4th Amendment protections. While he agrees that new technology can give the government greater investigatory power than the 4th Amendment originally envisioned, Mosaic Theory is not required to restore balance. Sequential analysis could correct concerns of erosion of 4th Amendment protections by ruling that certain actions taken by police drones are always unconstitutional. Kerr finally recommends that if the people find a certain manner of police conduct undesirable, it would be better to pass legislation disallowing it.

Critical Academics

Figure 6 A Global Hawk Surveillance Drone

The most directly relevant critical author is Kristin Bergtora Sandvik in her chapter, *The Political and Moral Economies of Dual Technology Transfers: Arming Police Drones of the book Drones and Unmanned Aerial Systems: Legal and Social Implications for Security and Surveillance*[58]. In her chapter, Sandvick highlighters her concerns with armed police drones and the methods by which they are being advocated. Her first contention is that armed drones are not used by police departments because they are useful, but because they are being foisted upon them by the military drone industry to compensate for declining demand from the military. It is important to note here that Sandvick and other critical authors use drones to almost exclusively refer to large fixed wing aircraft equipped with missiles such as Predator, Global Hawk, and their close relatives. She does not discuss small consumer drones predominantly used by police departments. Sandvick refers to the method by which the drone industry attempts to increase public support for armed drones as "moral economy." She argues that the drone industry is attempting to create a trojan horse

[58] Zavrsnik, Ales. Drones and Unmanned Aerial Systems: Legal and Social Implications for Security and Surveillance. N.p., 2016. Print.

argument for the adoption of armed drones by police departments by emphasizing good use cases for drones, such as firefighting and search and rescue.

This trojan horse argument creates a link to another critical work on police drones by Daniel Connolly. In his article, *New Rules for New Tools? Exploitative and Productive Lawfare in the Case of Unpiloted Aircraft,* Connolly argues that the military drone industry is engaging in an aggressive program of Lawfare to facilitate the adoption of armed drones by police departments and thus expand the markets they might sell to[59]. Connolly describes Lawfare as the malicious exploitation of gaps in existing law and potential legislation to create new markets for drones.

Michael Salter in his article *Toys for the Boys? Drones, Pleasure and Popular Culture in the Militarization of Policing* attributes adoption of drones by police departments to fetishistic masculine militarism[60]. He argues that police departments are guided by a weapons fetish that overpowers logic, pointing to studies[61] that Predator drones have higher operating costs than most civilian manned aircraft. He argues that drones have limited to no utility for crime prevention and other police use cases.

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[59] Connolly, Daniel. "New Rules for New Tools? Exploitative and Productive Lawfare in the Case of Unpiloted Aircraft." Alternatives: Global, Local, Political 43.3 (2018): 137–156. Web.

[60] Salter, Michael. "Toys for the Boys? Drones, Pleasure and Popular Culture in the Militarization of Policing." Critical Criminology 22.2 (2014): 163–177. Web.

[61] Haddal, C. C., & Gertler, J. (2010). Homeland security: Unmanned aerial vehicles and border surveillance. Congressional Research Service. http://www.fas.org/sgp/crs/homesec/RS21698.pdf.

Chapter 5: Independent Recommendations

The aim of this report is to produce a concise and complete set of recommendations for how police departments could use unmanned aerial vehicles. This report's recommendations come from a perspective of trying to find the optimal equilibrium between efficiency and civil liberties. Before I dive into my own recommendations, I feel it's useful to consider the recommendations offered by others.

One set of recommendations comes from the International Association of Chiefs of Police (IACP)[62]. The key recommendations from their report on how police departments should use unmanned aircraft are:

- Ensure pilots are properly trained and drones are airworthy;
- Publicize plans to use drones and receive input from the local community on those plans;
- Follow applicable federal, state, and local laws;
- Deploy drones only with that approval of a supervising officer;
- Record how, when, and why drones are used;
- Refrain from arming drones; and
- Delete drone-acquired data unless it must be retained for a criminal investigation.

I would argue that these recommendations are so narrow in scope that they are not particularly useful. I also argue that IACP recommendations suggest the bare minimum of safety, accountability, and legality requirements for any drone program. The IACP does not offer recommendations as to what purposes drones should be used for, how they ought to be used, or how to navigate the numerous grey or entirely untested areas in the law.

Another, more specific set of recommendations comes from the American Civil Liberties Union in their recommendations to the US Senate Judiciary Committee in 2013[63]. To summarize, the

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[62] *Recommended Guidelines for the Use of Unmanned Aircraft* . International Association of Chiefs of Police, Aug. 2012, www.theiacp.org/sites/default/files/all/i-j/IACP_UAGuidelines.pdf.

[63] The Future of Drones in America: Law Enforcement and Privacy Considerations – ACLU Statement for the Record for a Senate Judiciary Committee Hearing. American Civil Liberties Union, 20 Mar. 2013, www.aclu.org/other/future-drones-america-law-enforcement-and-privacy-considerations-aclu-statement-record-senate.

ACLU argues that drones pose a unique and significant risk of abuse. In particular, the ACLU had the following concerns:

- Systematic surveillance of all persons always;
- A chilling effect on political and social activity due to the knowledge that one is being surveilled;
- Magnification of unscientific bias in policing; and
- Deepen a trend in the automation of law enforcement.

To address these concerns the ACLU recommended that drones should not be used except:

- Where a warrant has been obtained;
- Where the drone would collect evidence relating to a specific crime;
- Where there is a geographically and time limited emergency (ex. search and rescue); and
- For reasonable non-law enforcement purposes that do not impact privacy;

Furthermore, the ACLU suggests that drone footage should not be retained unless there is reasonable suspicion the images contain evidence of a specific crime. Drone programs should require public approval, face independent audits, and be discontinued if there is no clear financial benefit. Finally, armed drones should be categorically prohibited, lethal or non-lethal.

The final set of recommendations I would like to discuss come from Rand Paul of the United States House of Representatives. In his proposed bill Preserving Freedom from Unwarranted Surveillance Act of 2012,[64] Rand Paul called for a ban on any government agency collecting information pertaining to criminal conduct using a drone without a warrant.

[64] Preserving Freedom from Unwarranted Surveillance Act of 2012, S. 3287, 112th Cong.

Chapter 6: Report Recommendations

The recommendations of this report focus on finding a balance between the utility of drones and valid practical and legal concerns as to how they might be abused. Every use case described in this report appears to be constitutional. This leaves police departments discretion, absent state law, to implement drone programs in the manner they see fit.

Universal Recommendations

Police department drone program policies, procedures, drone make, and model, drone equipment, and associated FAA waivers should all be publicly available and easily accessible. These policies should include in detail the use cases for which the police department's drones will be used. Similarly, when these documents are updated, notice should be sent out to interested parties. The example of Chula Vista is especially relevant here. Their drone program, despite being the most expansively implemented drone programs appears to be popular.

Police operated drones should be marked with the same color scheme and lights as other police vehicles. Small drones are by their nature stealthy. Absent a compelling reason to use that ability, police drones should declare their presence with lights.

Drones should turn off their sensors and navigate using Instrument Flight Rules while transiting from a launch site to a target area. While this recommendation may not be necessary according to the constitution, federal, or state law, I believe it is a good policy to protect the privacy of citizens during incidental flyovers of private property. In a robust drone program, police drones might crisscross the skies hundreds of times per day. If their cameras were left on, thousands of terabytes of footage would be produced, most of it of private property. It would save on data storage costs and protect privacy to never collect such footage in the first place.

Drones should be deployed at the discretion of the highest ranked officer on the scene, unless a warrant is required by state law. In situations where life may be in immediate danger the highest ranked officer at the scene should have the ability to request a drone without referring the decision for consideration.

Data collected by drones should be deleted within sixty days unless there is reason to believe the data contains information relevant to a specific criminal investigation. This recommendation is both practically and ethically sound. Storing drone footage indefinitely could be prohibitively expensive. Also, police departments could likely be forced to provide drone footage in open records requests, effectively releasing footage of what lawful citizens do in their backyards.

Use Case Recommendations

There are use cases for drones that do not raise privacy or liberty concerns and so should be implemented as justified based on improvements to effectiveness and efficiency. **This report recommends that police departments should adopt drones for the use cases of:**

- Crime Scene Investigation;
- Hazardous Materials Investigation;
- Event Overwatch; and
- Search and Rescue.

All these use cases allow a police department to more effectively and efficiently perform routine tasks they already carry out. There are also numerous other niche use cases not discussed in this report. For example, in many rural counties a police officer is required to monitor prescribed burns. A drone would greatly improve an officer's ability to verify that the burn is in fact under control.

Use Case: Traffic Enforcement

This report recommends that drones be used for traffic enforcement, but only after the rules of the road and citations for violations of them have been adjusted to reflect the higher rate of enforcement.

For example, interstates often have a speed limit at 65 mph while traffic moves at a prevailing speed of traffic is 75 mph. While automatic citation of all speeding vehicles would reduce the prevailing speed, this report would instead recommend increasing speed limits to the prevailing speed and enforce the higher speed limit. Similarly, the value of citations should be reduced so

that the revenue from traffic enforcement activities does not increase significantly as a result of the drone program. This could be necessary to avoid the voter backlash that has resulted in automated traffic enforcement programs being banned in many states.

A human police officer should make the final decision to issue a citation. While this decision could be outsourced to a contractor or software program, this report believes that the integrity, reliability, and accountability a human police officer brings to the decision to issue the citation significantly enhances the value of a drone traffic enforcement program. Furthermore, this report recommends that **calibration records of the drone's sensors be included in citations as proof of the authenticity and accuracy of the drone-produced evidence.**

Use Case: Reconnoitering and Drones as First Responders

Police departments should use drones for reconnoitering while executing search warrants, hot pursuits, and responding to 911 calls where there is immediate risk of loss of life or serious injury. The purpose of a drone in these scenarios is to provide useful information without placing a human officer in harm's way. The additional information the drone could save a life, provide critical evidence, or save department resources. By providing a fuller and more accurate picture of the situation, drones in this use case could make police interactions where they are present safer for all involved.

Use Case: Surveillance

Police departments should use drones to surveil scientifically selected crime prone areas. Monitoring crime prone areas is a role already performed by patrolling police officers. Drones can do the same more efficiently, freeing up human officers to perform more important roles. How areas to be so monitored are selected is a serious and challenging issue to consider, and beyond the scope of this report. Such a program would also make it essential that a police department routinely delete superfluous surveillance data.

A targeted individual should not be surveilled on public or private property absent a warrant. The most compelling reason for this recommendation is that in a plurality of states it is the law. Even in states where police departments retain discretion to surveil without a warrant, they should not. That Supreme Court rulings permit warrantless and indefinite surveillance of

any person from the air does not mean this discretion should be exercised. It is this report's judgement that Probable Cause, the burden of proof to obtain a warrant, is a reasonable threshold to bring the resource of indefinite and undetectable surveillance to bear against a person.

Use Case: Armed Drones

This report recommends arming drones, but only for the purposes of combating other drones. Police departments increasingly need to be prepared to deal with hostile drones that may be equipped with firearms or bombs. Officers on the ground are unlikely to have the warning, mobility, line-of-sight or right equipment to deal with a hostile drone. Another police drone equipped with a net gun appears to be the most effective and least expensive countermeasure.

Conclusion

The policy recommendations in this report attempt to balance improving the effectiveness and efficiency of police departments while protecting the rights and liberties of citizens. However, many of the recommendations provided will be outdated in a few short years. Active court cases could provide definitive answers to numerous constitutional questions. Congress may pass legislation requiring warrants for drone surveillance. New technology might make drones cheap enough to become standard equipment in every police cruiser. Tension between the United States and China might lead to an embargo of Chinese drone manufacturers.

If there is any single takeaway for any reader, it is that police departments have extraordinary discretion in how they use drones. Finding the right way to apply that discretion will be a subject of debate, legislation, litigation, and future research.

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