

BACKGROUND

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Drones in U.S. Airspace: Principles for Governance

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Abstract

Flying drones—unmanned aerial vehicles—have been made famous by their use in the war on terrorism, notably in operations in Iraq and Afghanistan, but such military drones are a small fraction of those used by the United States today. Thousands of drones are used for a wide variety of purposes, from scientific research to military operations. Both government and the private sector use drones mostly without weapons capabilities. Because of their wide-reaching surveillance capabilities, however, even unarmed drones could threaten personal privacy and civil liberties. As the Federal Aviation Administration develops regulations for the operation of drones in domestic skies, it should consider constitutional concerns and privacy rights.

Rapidly advancing technology has made it possible to employ pilotless aircraft “drones” for public missions (such as countersurveillance and strikes on enemy targets) as well as private purposes (such as crop dusting). As new technologies present these options to policymakers, it is an opportune time to establish general principles and legal guidelines for the government’s use of drones in domestic airspace. These guidelines should go beyond safety and transit issues that are addressed by the Federal Aviation Administration (FAA), the agency that oversees regulation of civil aviation, and should define the scope of permissible federal activities. Congress should play an active role in establishing the guidelines.

It is no accident that questions of law and policy relating to the domestic use of drones have moved to the front burner in Washington. The saliency of the issue was heightened by a little-noticed provision in the congressional bill reauthorizing the Federal Aviation Administration. A much wider-ranging bill (dealing with funding questions and modernization of the air traffic control system) contains one little-noticed section directing the FAA to develop and promulgate a series of regulations

KEY POINTS

- Today’s technology makes it possible to employ pilotless aircraft “drones” for public missions (such as countersurveillance and strikes on enemy targets) as well as private purposes (such as crop dusting).
- As new technologies present these options to policymakers, they should establish general principles and legal guidelines for the government’s use of drones in domestic airspace.
- These guidelines should go beyond safety and transit issues that are addressed by the Federal Aviation Administration. Guidelines should define the scope of permissible federal activities, and Congress should play an active role in establishing them.
- Both government and the private sector use drones mostly without weapons capabilities. Because of their wide-reaching surveillance capabilities, however, even unarmed drones could threaten personal privacy and civil liberties.
- As the FAA develops regulations for the operation of drones in domestic skies, it should consider constitutional concerns and privacy rights.

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that would establish the rules of the road (or, more accurately, the rules of the airspace) for the operation of drones in domestic skies.¹ As framed in the FAA reauthorization bill, the presumption was, broadly speaking, that domestic drone use is appropriate and that the only real questions were technical, relating, for example, to delineating air corridors for drones and standards of reliability for ensuring their safe operation.

Understanding Drones

For most people, the word “drone” conjures up an image of a lethal, missile-armed “Predator” or “Reaper” unmanned aerial vehicle (UAV) like those used in the Iraq and Afghanistan campaigns. Yet they are a small fraction of the types of drones used by the United States today.

The use of drones is not new. Israelis designed the modern, glider-type drone in the 1970s to be lightweight and small, making it inexpensive to build and difficult to shoot down. After the United States produced the Predator, UAVs became an indispensable military tool.

Today, there are thousands of drone platforms that are used for a wide variety of purposes, from scientific research to military operations. Drones are employed by governments and by the private sector. The drones themselves are entirely unmanned and are controlled by a human operator. The remote operators of drones are highly skilled and

must be trained not only to carry out intelligence, surveillance, and reconnaissance missions, but also to conduct or respond to electronic attacks, implement strike missions, conduct search and rescue operations, and many other tasks. Such remote piloting greatly reduces the risks to the drone operator and makes the vehicles cheaper to produce.

BECAUSE OF THEIR SURVEILLANCE CAPABILITIES, WITHOUT PROPER LEGAL GUIDELINES AND OVERSIGHT, DRONES COULD THREATEN PERSONAL PRIVACY AND CIVIL LIBERTIES.

The Pentagon currently controls some 7,000 military-grade drones—up from fewer than 50 drones just a decade ago.² The drones have been used increasingly in military missions overseas, first running reconnaissance and then targeting al-Qaeda operatives in Afghanistan, Iraq, Pakistan, Somalia, Yemen, and elsewhere.

Domestically, different types of drones are now being used on a non-controversial limited basis for border patrol, biological and chemical air testing, geological surveys, livestock and wildlife monitoring, crop dusting, wildfire containment, and search and rescue operations.³⁴ These drones are not armed with weapons, nor are they capable of carrying any. Their use will only increase as drones become smaller and more sophisticated and their

cost plummets. Non-governmental entities, as well as individuals, can purchase a wide variety of drones for their own use.

Because of their surveillance capabilities, however, without proper legal guidelines and oversight, drones could threaten personal privacy and civil liberties. Therefore, as the FAA develops regulations for the operation of drones in domestic skies, it must also take into account constitutional concerns and privacy rights. To date, the FAA has interpreted its mandate to focus solely on technical issues, such as delineating air corridors for drones, and instituting standards for safe operation.

General Principles

Any guidelines must ensure appropriate protections of the freedoms guaranteed to U.S. citizens under the Constitution. The general rule balancing security and freedom is to be found, in large part, in the structure of American constitutional government itself. The protections codified in the Bill of Rights are an additional firewall against any intrusions on liberty that would unravel the checks in the Constitution. The Fourth Amendment’s prohibition against unlawful search and seizure is the right most directly implicated by unbounded and unrestrained use of domestic drones.

Now is the time to return to first principles of individual liberty in a free society and assess their interaction with technology and governance

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1. Ben Wolfgang, “FAA Chief Says Drones Will Force Change at Agency,” *The Washington Times*, August 7, 2012, <http://www.washingtontimes.com/news/2012/aug/7/faa-chief-says-drones-will-force-change-at-agency/> (accessed August 17, 2012).
 2. U.S. Government Accountability Office, *Unmanned Aircraft Systems: Comprehensive Planning and a Results-Oriented Training Strategy Are Needed to Support Growing Inventories*, GAO-10-331, March 2010, <http://www.gao.gov/new.items/d10331.pdf> (accessed August 29, 2012).
 3. Chad C. Haddal and Jeremiah Gertler, “Homeland Security: Unmanned Aerial Vehicles and Border Surveillance,” *Congressional Research Service Report for Congress*, July 8, 2010, http://assets.opencrs.com/rpts/RS21698_20100708.pdf (accessed August 29, 2012).
 4. Brian Bennett, “Drones Tested as Tools for Police and Firefighters,” *Los Angeles Times*, August 5, 2012, <http://www.latimes.com/news/nationworld/nation/la-na-drones-testing-20120805,0,6483617.story> (accessed August 29, 2012).

in an age of domestic drones. There are basic first principles that underlie any use of new technology and the existing constitutional limitations that might apply to drones. An assessment of these principles suggests that there are:

- Substantial liberty interests;
- Acceptable domestic uses of drone technology that should be permitted and in fact fostered, such as the use of drones to search for survivors after a disaster; and
- Prohibited uses of drone technology that raise significant questions of law and policy—such as the deployment of drones operated by the military within U.S. borders in a manner that violates existing rules (such as *Posse Comitatus*) on the use of military force domestically.

Beyond these uses, the challenge for the Administration and Congress is to define strict, appropriate implementation policies and oversight structures that can protect individual liberties while allowing appropriate uses of domestic drones with appropriate oversight.

First Principles and Drones

As a practical matter, the FAA has expertise in and is the appropriate forum for considering safety and technical questions, but other governmental bodies have expertise in and are better suited to address privacy and civil liberties concerns. Given the potentially wide range of uses for drones in U.S. territory, resolving air-traffic safety and security issues alone is inadequate.

Washington needs a more comprehensive and thoughtful framework.

Fundamentally, these are questions of law and policy. The issue is not whether the use of drones is technically feasible: Obviously, it is and will be increasingly so. Nor is it a question of legality: Most current uses are lawful, and most future uses are likely to be. Rather, the proper subject for discussion is the extent to which society wants to provide tools to the state that have beneficial uses and are also susceptible to abuse.

This question is not a new one; it is one that has been a tension point within American society since the Founding. Americans want a government that fosters liberty and freedom and that provides security. Americans want a constrained government that is subject to checks and balances and one that has “energy in the executive” (to quote Hamilton) to achieve legitimate governmental objectives. As always, striking the proper balance is both difficult and essential.

As a first step, several first principles should guide the analysis:⁵

- No fundamental liberty guaranteed by the Constitution can be breached or infringed upon.
- Any increased intrusion on American privacy interests must be justified through an understanding of the particular nature, significance, and severity of the threat addressed by the program. The less significant the threat, the less justified the intrusion.
- The full extent and nature of the intrusion worked by any new technology must be understood

and appropriately limited. Not all intrusions are justified simply because they are effective. Strip searches at airports would certainly prevent people from boarding planes with weapons, but they would do so at too high a cost.

- Whatever the justification for the intrusion, if there are less intrusive means of achieving the same end at a reasonably comparable cost, the less intrusive means ought to be preferred. There is no reason to erode Americans’ privacy when equivalent results can be achieved without doing so.
- Any new system that is developed and implemented must be designed to be tolerable in the long term. The war against terrorism, uniquely, is one with no foreseeable end. Thus, excessive intrusions may not be justified as emergency measures that will lapse upon the termination of hostilities. Policymakers must be restrained in their actions; Americans might have to live with their consequences for a long time.

From these general principles one can derive certain other, more concrete conclusions regarding the development and construction of any new technology—principles that are directly relevant to the deployment of drones domestically:

- No new system should alter or contravene existing legal restrictions on the government’s ability to access data about private individuals. Any new system should mirror and implement existing legal limitations on domestic or

5. These principles first appeared in Paul Rosenzweig, “Principles for Safeguarding Liberty in an Age of Terrorism,” Heritage Foundation *Executive Memorandum* No. 854, January 31, 2003, <http://www.heritage.org/research/reports/2003/01/principles-for-safeguarding-civil-liberties>.

foreign activity, depending on its sphere of operation.

- Similarly, no new system should alter or contravene existing operational system limitations. Development of new technology is not a basis for authorizing new government powers or new government capabilities. Any such expansion should be justified independently.
- No new system that materially affects citizens' privacy should be developed without specific authorization by the American people's representatives in Congress and without provisions for their oversight of the operation of the system.
- Finally, no new system should be implemented without the full panoply of protections against its abuse. As James Madison told the Virginia ratifying convention in 1788, "There are more instances of the abridgment of the freedom of the people by gradual and silent encroachments of those in power than by violent and sudden usurpations."⁶

Legal Guidelines and Limits on Use

While wide-scale domestic drone usage is an emerging phenomenon, the Administration and Congress are not without legal guidance.

There are likely to be few direct constitutional limits on the domestic

use of drones. The nearly parallel case, *Dow Chemical Co. v. United States*,⁷ involved the use of helicopters to survey the walled compound of a chemical facility. The Supreme Court concluded that the use of helicopters in this manner did not require a warrant.

This is a natural extension of the general rule that law enforcement does not need a warrant to examine conduct that is exposed to public view—at least in part because by performing one's actions in public, one has manifested the absence of a reasonable expectation of maintaining his privacy. Hence, as someone walks down the street, the police need no warrant to follow him. Likewise, in pursuit of an escaping criminal, police may follow him by car, and police helicopters may monitor traffic without a warrant. Extending the warrant requirement to drone activity would therefore be novel and a significant dislocation of current practice.

Nevertheless, it is also likely that outer limits on the use of drones domestically may exist if the drones are equipped with advanced sensor technology. In the case of *Kyllo v. United States*,⁸ the Supreme Court considered the use of infrared sensing devices to obtain the heat signature inside a house. (The signature was indicative of plant-growing lamps used to cultivate marijuana.) The Court concluded that the use of novel sensors, not generally available to the public, would implicate the reasonable expectation of privacy. The Court held that a warrant was

required to use an infrared sensor to monitor the heat signature of a house.

CAMERA-EQUIPPED DRONES USED FOR ROUTINE PURPOSES, SUCH AS OBSERVING PUBLIC ACTIVITY, WILL LIKELY PASS CONSTITUTIONAL MUSTER. LEGAL LIMITS ON SUCH USE, IF ANY, WILL COME FROM POLICY DEVELOPMENT OR STATUTORY ENACTMENTS.

One can suggest that *Kyllo* would support the broader conclusion that placing unusual sensor arrays on drones (say, a millimeter-wave ground-penetrating radar) might require a warrant in situations where a more common sensor (such as a camera) would not.

Limits on domestic drone use may also arise when and if drones proliferate such that widespread and large-scale observation and data-collection mechanisms are enabled. Here, the Supreme Court doctrine is still in development, but the Court has sounded a cautionary note. This past term, in *United States v. Jones*,⁹ Justice Samuel Alito wrote a concurrence (speaking for only four Justices) in which he posited that even though the collection of an individual piece of data might be lawful without a warrant, the collection of numerous such pieces of data to form a larger mosaic picture would raise constitutional concerns. Under this so-called mosaic theory, limits on the collection of routine images throughout a city—linked to a facial

6. James Madison, Speech in the Virginia Ratifying Convention on Control of the Military, June 16, 1788, in *History of the Virginia Federal Convention of 1788*, Vol. 1, p. 130 (H.B. Grigsby ed. 1890).

7. 476 U.S. 227 (1986).

8. 533 U.S. 27 (2001).

9. No. 10-1259, __ U.S. __ (2012).

recognition program, for instance—might exist.

As mentioned, this legal doctrine has yet to be adopted by the Supreme Court, but it, too, sounds a cautionary note: Certainly, the routine and systematic use of drones for widespread surveillance and analysis is likely to be suspect on constitutional grounds.

These precedents clearly suggest a “sweet spot” for lawful domestic drone activity. Camera-equipped drones used for routine purposes, such as observing public activity, will likely pass constitutional muster. Legal limits on such use, if any, will come from policy development or statutory enactments.

Striking the Right Balance

Given these guidelines, acceptable uses that (safety considerations permitting) ought to have sensible and minimal restrictions, are:

■ Border Patrol Security

1. Long-term surveillance of a specified area or route
2. Criminal personnel search and/or pursuit
3. Personnel search and rescue
4. Monitoring of “blind spots”
5. Communications augmentation (e.g., hosting flying cell phone towers¹⁰)

■ Emergency Preparation and Disaster Response

1. Planning routes and anticipating vulnerabilities

2. Long-term surveillance of a specified area or route
3. Catastrophic effects and remediation planning
4. Criminal personnel search and/or pursuit
5. Personnel search and rescue
6. Emergency cell coverage restoration
7. Deterrence of criminal behavior in unpatrolled areas

■ Agriculture

1. Crop dusting (pesticides) or infestation eradication
2. Monitoring of soil moisture levels and crop growth

■ Cargo Delivery (private sector)

1. Long-haul trips
2. Transporting hazardous materials
3. Deliveries during hazardous flying conditions and emergencies

■ Maritime Domain Awareness

1. Long-term surveillance of a specified area or route
2. Criminal personnel search and/or pursuit
3. Personnel search and rescue
4. Identification and surveillance of low observable vessels

(semi-submersibles) and small craft (under 300 tons)

■ Environmental Monitoring

1. Long-term surveillance of a specified area or route
2. Wildlife tracking
3. Monitoring droughts and flooding
4. Monitoring locks, dams, and levees in remote areas

■ Law Enforcement

1. SWAT team reconnaissance
2. Long-term surveillance of a specified area or route
3. Criminal personnel search and/or pursuit
4. Personnel search and rescue
5. Communication augmentation

There are, of course, some clear “red lines” where domestic drone use should be prohibited. The use of drones in a military capacity (while armed) should be severely restricted to situations of actual invasion or insurrection; the use of drones for domestic surveillance of First Amendment activity is fundamentally at odds with U.S. constitutional principles; drones equipped with novel sensor arrays ought not to be permitted absent a clearly demonstrated need and a careful consideration of countervailing privacy and civil liberties concerns; and drones should not be used as a platform for

10. See, for example, “Flying Cell Towers,” DailyWireless.org, March 6, 2012, <http://www.dailywireless.org/2012/03/06/flying-cell-towers/> (accessed September 7, 2012).

the collection of massive unstructured data sets that could form the basis for sophisticated tracking and behavioral analytics.

Finally, drones are unsuitable for use as a routine means of surveillance in non-threatening situations. Certainly, one can envision the utility of deploying drones to monitor the progress of a peaceful protest march on Washington, D.C., but the idea of a watchful “eye in the sky” for basic crowd control of peaceful activity crosses an indefinable line—at least in part because the cheapness of drone resources (compared to the deployment of police) would make their ubiquitous use far more likely.

CONGRESS CANNOT AND SHOULD NOT AVOID THE HARD TASK OF SORTING PERMISSIBLE USES FROM IMPERMISSIBLE USES ON ITS OWN.

The notion of imposing a warrant requirement on the use of drones is likely a categorical mistake, as it would involve the application of a Fourth Amendment concept to an area where the Fourth Amendment simply does not apply. Congress cannot and should not avoid the hard task of sorting permissible uses from impermissible uses on its own; it is likely that many of the uses envisioned would not fit in the warrant construct at all. Many of the prohibitions recommended are independent of the existence or lack of probable cause.

Next Steps for Congress

Congress and the executive

branch have yet to do the hard work of determining precisely what those limits on drone use ought to be, and this paper’s outline suggests that the lack of thought in some of the blunt-instrument proposals currently pending might very well throw the baby out with the bath water.

The way forward, however, is reasonably clear. Congress should:

- **Permit** the FAA to continue with its rulemaking regarding the domestic use of drones but make clear that the rulemaking is limited to issues of safety and airspace use that are squarely within the FAA’s expertise;
- **Condition** further expansion of the domestic use of drones in accordance with the FAA’s rulemaking on the development of clear guidelines on permissible uses for drones and the development of an oversight and audit mechanism; and
- **Task** the Administration with the development of guidelines that, at a minimum:
 1. **Recognize and authorize** legitimate uses of drones that pose no appreciable risk to privacy or civil liberties;
 2. **Prevent** the militarization of the domestic drone air fleet;
 3. **Prohibit** the use of drones to monitor constitutionally protected First Amendment expression; and

4. **Ensure** that drones do not become another comprehensive platform for the collection of large data sets of unstructured surveillance data.

In the absence of congressional action, the executive branch should reluctantly proceed independently with the development of its own privacy and civil liberties policies for the use of drones. What should not happen—what cannot be allowed to happen—is that domestic drones continue to proliferate without any consideration of privacy and civil liberties. What also must not happen is that Americans allow an unreasoned fear of hypothetical abuse to stampede the country into a blanket prohibition on the use of drones for domestic purposes, depriving all Americans of a wide range of benefits.

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