

Regulation of unmanned aerial vehicles law general essay

[Law](#)



**ASSIGN
BUSTER**

Jonathan ZdasiukDiane MartinelliAmerican Government1st Period

Regulation of Unmanned Aerial Vehicles in Domestic Airspace

Drones, also called unmanned aerial vehicles (UAVs), have been used by the United States Military for over a decade. Recently though, military drones have been used by various groups such as the Forest Service and Border Patrol to obtain aerial imagery in domestic airspace over the United States. At the same time, much of the technology that allows drones to function autonomously has become smaller, less expensive, and available to consumers, thereby allowing companies and even individuals to build small drones for both the military and the private sector. While the rapid expansion in drone production and use has highlighted what drones are capable of, it has also sparked controversy. Some laws currently regulate domestic drone use, but they are incomplete placeholders for legislation currently being debated (Bennet and Rubin). Currently, laws limiting flight of drones over U. S. airspace are limited, restrictive and do not differentiate between types of unmanned aerial systems. No organization can fly any UAV in domestic airspace more than 400 feet above the ground without a permit from the Federal Aviation Administration, or FAA. In the application, the purpose of the flights must be addressed as well as countless other pieces of information including routes and safety procedures. However, these highly coveted permits are addressed by the FAA on a case-by-case basis, limiting the current domestic use of drones (Gates). While there are approximately three hundred of such permits issued, most drone operators are unknown to the general public; the FAA refuses to release the list. One self-professed user of

the Predator drone, though, is Customs and Border Protection. Under a special permit from the FAA, they have been flying unarmed Predator drones since 2011 (Bennet and Rubin). Steps have already been taken by Congress to integrate more drones into domestic airspace, including forming the Congressional Unmanned Systems Caucus to discuss both regulations and uses of unmanned vehicular technology. Their current goal is to create a new licensing system for non-military drones by 2015 (Hennigan). This would allow for more widespread use by eliminating the long and complex certification process currently in place. Furthermore, it would help integrate drones with manned aircraft. Part of the new licensing system mirrors the current manned aircraft certification process. Unlike manned aircraft, though, UAVs will be certified in six flight test ranges, where inspectors and manufacturers can fly and test new drones without risk to humans on the ground or other manned aircraft. The FAA projects that, with these new regulations, as many as 30, 000 drones could be operating in domestic airspace by 2020. However, decisions still have not been made about some regulations for these drones, like altitude and usage restrictions (Smithson). One major issue facing the legislation of drones is the separation of privacy and safety concerns. The FAA is currently in charge of drafting the safety laws that regulate drone activity, and how drones interact with other manned aircraft. With manned aircraft, safety regulations often also cover privacy concerns. Large, manned aircraft are not permitted to fly very near the ground in populated areas except during takeoff and landing in order to prevent major accidents that injure uninvolved bystanders. This makes it difficult to obtain extremely detailed information from them about subjects

on the ground. However, some drones are extremely small and can safely operate only a few feet in the air, allowing them to obtain information almost as detailed as a person could obtain. This means that, unlike manned aircraft, practicality and safety do not protect the privacy of citizens. Consequently, new laws must be developed to protect individuals' privacy from aircraft, even though the subject rarely had to be addressed with manned aircraft (Gates). Privacy and safety are also two of the most prevalent arguments for banning, or at least very heavily regulating, drones over United States airspace. Because they do not have to carry a pilot, drones require less power to stay aloft compared to a manned aircraft with the same mission. This means they are more fuel efficient and can stay aloft far longer; the Predator drone commonly used by the military in the Middle East can stay aloft for over a day without refueling. Over Afghanistan, drones track targets for days or even weeks, which would not be possible with manned aircraft that are limited by pilot endurance and fuel consumption (Aguirre). This capability worries many civil liberties groups, though. They argue that the long endurance will allow for law enforcement to easily track people in a similar manner. While long-term tracking and surveillance were not generally significant issues in the past, some argue that this was because of the operating cost. Helicopters cost several hundred dollars to operate per hour, and teams of officers on the ground cost even more. With the low operating costs of drones, long-term surveillance on civilians would become more affordable and thus more prevalent (Lye). Additional privacy concerns stem from the low purchase price of UAVs compared to those of manned aircraft. While " a helicopter costs \$3 million to purchase...a drone

costs less than 1/30 of that," according to the American Civil Liberties Union (Lye). This low cost allows police departments and other law-enforcement agencies that cannot afford a helicopter most of the benefits of one.

According to some activists, this will result in proliferation of indiscriminate surveillance that violates citizens' privacy (Lye). When facial recognition technology currently in development for use on UAVs is implemented, some argue that police will use small drones to spy on the general public, then catch and prosecute people committing minor offenses (Gates). The small size of many drones also contributes to the privacy concerns. As stated earlier, many drones can hover only feet off the ground and weigh only a few pounds. While a manned aircraft gathering surveillance cannot unobtrusively hover outside a window or fly through a backyard, some drones can. Like the low cost of some UAVs, this capability worries privacy advocates. They argue that the small dimensions of drones will allow their capabilities to be abused by law enforcement, and that the drones will regularly gather information that should not be obtained without a warrant (Gates). Safety concerns also are an argument against allowing drones over the United States, especially over populated areas and in crowded airspace. First, it is difficult for many UAVs to interact with other aircraft. Because it lacks a pilot and often only has one fixed-position camera, a small UAV cannot easily locate other aircraft operating around it. While a plane or helicopter pilot can look around outside of the aircraft, the narrow field of view of a camera reduces drone pilots' situational awareness. Furthermore, because the pilot is not in the aircraft, failures of certain components like the electrical system are much more likely to result in a crash. In a manned aircraft, if all electrical power

were lost, the pilot could still control the aircraft and safely land it at a nearby airport. In a drone, however, a complete electrical failure would shut down all communications equipment. The pilot would lose contact with the aircraft, and it would crash. In addition, because UAVs do not carry people on board, the components often are not as thoroughly tested so onboard systems sometimes lack the redundancy found in manned airframes to reduce cost. For example, "cost-saving techniques such as the use of wooden propellers and less attention to watertight sealing leave some [UAVs] more vulnerable to precipitation than manned aircraft" (A Summary of Unmanned Aircraft). The completely autonomous nature of some drones also poses safety issues. While some UAVs receive pilots' control inputs directly through a radio or satellite link, others utilize onboard autopilots that are programmed with waypoints for a flight. The drone can then be sent off to autonomously complete its mission, without a pilot. This approach raises issues, though, if a mistake were to occur. If a pilot in a manned aircraft accidentally sets the altitude for an autopilot too low, it is easy to see the problem and adjust the autopilot accordingly. Most drones, though, will not realize that a problem exists, and consequently fly themselves into the ground, resulting in a crash (Federal Aviation Administration). Similarly, drones cannot solve problems the way human pilots can. If a sensor such as an altimeter or airspeed sensor were to fail, many drones could not work around the problem and continue to fly. While a human in an aircraft can determine that the sensor is broken and not use it, most automated control systems cannot make this judgment. They will continue to fly based on information, often crashing as a result (Levin). One major supporter of

drones operating over the United States, and working to improve their safety, is the U. S. Military. The large numbers of drones currently stationed in the Middle East will eventually need to come back, and many military officials hope to be able to fly them in " a fully integrated environment" (Hennigan). In order to integrate UAVs with the current fleet of manned aircraft, though, laws governing the two types of vehicles need to be consistent. One obstacle for safe coexistence is that UAVs must not crash into other aircraft. To avoid this, tests will begin this summer at Dugway Proving Ground, one of the Army's sites for testing new military technology, of radar-based sense-and-avoid technology. If successful, it will allow drones to find other manned or unmanned aircraft around them. Once located, the drone will then alter its route to avoid any collisions. If successful, this technology will be a major leap forward towards the integration of UAVs with other aircraft and towards safe drone use in domestic airspace (Hennigan). Supporters of flying drones in domestic airspace argue that even with current technology, UAVs' benefits far outweigh their negatives. First, drones allow people to accomplish otherwise impossible or very expensive tasks. For example, they can provide farmers and ranchers with real-time aerial imagery to check on crops. This imagery can then be used to determine " where pests are located or where crops need irrigation" (Margolis). The costs of operating full-sized, manned aircraft to accomplish this task would be prohibitive. Other groups cite possible uses from tracking wildlife populations to patrolling oil pipelines and electricity transmission lines (Margolis). Drones can also save lives by going where manned aircraft cannot. When firefighters are battling forest fires, they often rely on satellite imagery to give them

information on hotspots and the boundaries of a fire. However, the photographs taken by satellites are low resolution and only can be taken when the satellite passes overhead, or one to two times per day. Manned aircraft can provide higher quality, real-time imagery, but cannot fly within the smoky environment above a fire. Drones, however, can fly through the smoke without risking the life of a human pilot. Furthermore, they can be fitted with thermal imagers and night vision cameras to aid in finding fire boundaries. Furthermore, their low altitude lets them gather more detailed imagery than satellites can. Similarly, drones can be used in search and rescue scenarios. While weather often prohibits manned aircraft from performing search and rescue missions, UAV flight crews will not die in the event of a crash. Consequently, drones can find people then drop medical supplies, food, and water before relaying their position to rescue teams. Like UAV applications in firefighting, this capability has the potential to save lives by taking pilots out of dangerous situations (Gates). While some argue that the low cost of UAVs will lead to indiscriminate surveillance, supporters claim that it is an argument in their favor. The military has been using drones for years to replace expensive manned aircraft on surveillance missions. One such drone, the ScanEagle, costs only \$100, 000 and can accomplish the tasks of a much more expensive helicopter or surveillance aircraft. It can stay aloft for longer, too, and provide a live video feed from above for up to 24 hours (Shanker). This low cost is a means to increase public safety. Organizations like police and fire departments that cannot afford to purchase a full-sized manned aircraft could purchase a drone instead that would give them the same capabilities. More drones would improve public safety,

because they can engage in missions from law enforcement to search and rescue (Aguirre). Finally, supporters of domestic drone use argue that many potential problems with drone over the United States can be solved with legislation that treats the plethora of different types of drones differently. For example, a several pound helicopter smaller than some remote-controlled planes should not face the same restrictions as a multi-million dollar UAV the size of a small jetliner. Treating different types of drones separately, they argue, will allow their individual characteristics to be addressed without broad generalizations that impact all drones and eliminate some of their possible uses. Furthermore, they argue, the federal government should not ban drones from doing what manned aircraft already do (Gates). For example, many privacy advocates are concerned that drones will circle over cities 24 hours a day, watching citizens from above. However, most small drones are limited by flight times significantly less than an hour, and could not accomplish this task. A complete ban on all UAVs in U. S. airspace would eliminate the positive uses of these small drones in order to avoid a possible problem raised by only a few specific types of drones. Furthermore, some manned aircraft can already fly overhead and perform surveillance (Smithson). Clearly, an outright ban on flying drones over the United States would prevent them from accomplishing many potentially helpful and lifesaving missions. However, drones pose threats to safety and privacy if handled incorrectly. These concerns need to be balanced with carefully written laws that take into account arguments from both sides, such as minimum altitude restrictions while flying over private property and safety regulations for large drones flying around manned aircraft. Just as

importantly, though, current legislation that is very restrictive and treats all drones as equally needs to be changed. The disparate nature of UAVs demands that laws be written to address their unique features. While drones the size of manned aircraft that operate around other air traffic need to be certified and inspected to ensure safety, it does not make sense to require a drone that weighs only a few pounds, is the size of a model aircraft, and flies less than a hundred feet above the ground to undergo the same procedures. No matter how Congress decides to deal with the various issues associated with UAVs in domestic airspace, though, one fact is nearly certain. Drones will take on more diverse missions and their numbers will continue to grow in the future.