








DRONE REGULATION

SNAPSHOT: UNITED STATES



In the US, the Federal Aviation Administration (FAA) holds all regulatory authority over unmanned aircraft, more commonly known as drones. The agency governs commercial and recreational drones through Public Law 112-95, Section 336, “Special Rules for Model Aircraft” and Title 14 of the Code of Federal Regulation, Part 107. In 2016, the FAA [deployed](#) its current slate of regulations, providing greater clarity to drone operators. This helped spur growth in the US enterprise drone market — drone technology provider PrecisionHawk, for instance, saw its pipeline of inbound leads increase about 300% in the month after the regulations became effective, the company's CEO, Michael Chasen, told BI Intelligence. However, several restrictions, including the FAA’s line-of-sight requirement and its ban on drones flying over humans, have limited the market from reaching its full potential.

The FAA grants businesses exemptions to these rules under [Section 333](#), and had [issued 1,100 waivers in total as of November 2017](#). The FAA hasn't granted permission for any companies to operate a full-scale last-mile drone delivery service, but it has granted a sizeable number of exemptions for construction, energy, and agricultural firms for inspection and photo-gathering purposes. Additionally, Chasen told BI Intelligence that he expects the FAA to become more willing to grant exemptions for drone use in a variety of settings, even if regulations aren't officially softened or revised.

THE UNITED STATES BY NUMBERS		
	Gross Domestic Product	\$2.6 trillion
	Regulating Agencies	The Federal Aviation Administration, various states agencies
	Wireless broadband penetration	77%
	Estimated drone market size	\$6 billion in 2017
	Line of sight requirement?	Yes
	Pilot requirements	Must be at least 16, passed TSA vetting, have remote pilot certificate from FAA
	Name of law regulating drones	Title 14 of the Code of Federal Regulation, Part 107
Source: The Federal Aviation Administration, The World Bank, Pew Research Center, Gartner		BI INTELLIGENCE

Top Regulatory Issues

1. The FAA's line-of-sight requirement. This mandate says that commercial drones must operate only within the sight limits of the drones' pilots, severely limiting long-distance drone deliveries. As a result, it has prompted companies to move their initial drone delivery tests overseas. Amazon is testing its Prime Air drone delivery program in the [UK](#) countryside and Australia, for example, and Alphabet's drone delivery arm Project Wing [followed](#) the e-commerce titan to Australia last October.

Companies are exploring ways to circumvent this requirement — notably, Workhorse Group, an electric truck manufacturer, [partnered](#) with UPS to trial last-mile drone deliveries using specially modified Workhorse trucks. The drones launch from the roof of the trucks, after drivers load parcels onto the aircraft and confirm their flight paths. This method is picking up steam — German auto giant Daimler AG showed off a van similar to Workhorse's last year at the Consumer Electronics Show (CES). If the requirement remains in place in the coming years, we'll likely see other logistics firms explore this approach, as well.

2. The ban on drones flying over humans. This requirement limits a variety of use cases including drone deliveries, as well as aerial inspections of construction sites or agricultural fields. The FAA likely hopes this rule prevents the aircraft from falling out of the sky and hurting anyone on the ground, or potentially spying on bystanders. That said, the agency has granted several exemptions to this rule. CNN, for instance, [secured](#) permission to fly drones over large crowds from the FAA last October, a first for any company. And other organizations, including The New York Times and NFL, have received exemptions since then.

Drone use in populous areas is also limited by a lack of specific regulations or legal precedents related to privacy. The federal government doesn't have any concrete regulations around drone privacy, and neither do many state and local governments. In fact, the [Electronic Privacy Information Center](#) (EPIC) sued the FAA last year for not doing enough to provide clear guidance on this topic. And, while the National Telecommunications and Information Administration (NTIA) [released](#) guidelines around drones and privacy in 2017, they are completely voluntary and unenforceable. Meanwhile, a Munich Re [survey](#) of enterprise risk managers from last August found that a whopping 61% of respondents were concerned about the potential for invasion of privacy when commercial drones fly over homes or businesses. Unfortunately, because there's very little precedent to help courts decide privacy cases involving drones, or what fines may be levied for violations, this will likely remain a thorny issue until clearer regulation emerges.

Commercial Drone Laws In The US			
Pilot Requirements	Aircraft Requirements	Location Requirements	Operating Rules
<ul style="list-style-type: none"> -Must have Remote Pilot Airman Certificate issued by FAA. -Must be at least 16 years of age. -Must have passed TSA vetting process. 	<ul style="list-style-type: none"> -Drones must weigh less than 55 lbs. -Must be registered with the FAA if drone weighs more than 55 lbs. -Must have completed a pre-flight inspection to check for safe operating conditions. 	<ul style="list-style-type: none"> -Class G airspace, defined by the FAA as all airspace below 14,500 not otherwise classified as controlled by another classification. Typically space very near the ground (1,200 feet or less), but in mountainous regions can be higher. Class G airspace requires visibility of 1 mile to operate aircraft in. 	<ul style="list-style-type: none"> -Aircraft must remain within the line of sight of the operator at all times. -Can only fly at 400 feet or below. -Can only fly during daylight hours. -Must fly no faster than 100 miles per hour. -Drone must always yield the right of way to manned aircraft. -Must not fly directly over humans. -Must not fly from moving vehicles.
Source: Federal Aviation Administration		BI INTELLIGENCE	

3. A patchwork of state-level drone laws. The FAA does not bar states from crafting their own drone regulations, and several states — as well as local governments — have done so. However, state and local regulations can conflict with federal laws, creating legal confusion for businesses and drone operators. For instance, the Massachusetts town of Newton, an affluent suburb of Boston, was recently involved in a year-long legal battle over an ordinance that made it illegal to fly a drone over private properties at less than 400 feet in the air. In the end, a federal appeals court [ruled](#) the law was illegal because it conflicted with the FAA's requirement that businesses using drones fly them only under 400 feet. However, various drone industry experts and insiders expressed great confidence to BI Intelligence that federal, state, and local regulatory landscapes will all become more favorable to businesses and drone operators in the next few years.

4. Ban on autonomous drones. Autonomous drones flying pre-programmed delivery or inspection routes would largely eliminate the need for human operators altogether, vastly reducing the costs of operating drones for such purposes. However, BI Intelligence expects the ban on such aircraft will be one of the last major drone regulations to be relaxed or eliminated because of concerns around a hacker taking control of an autonomous drone. Moreover, some fleets would likely be programmed to fly together, presenting an even greater danger if they're taken control of. In addition, autonomous flying software and technologies require further development and testing to prove they can safely avoid any obstacles, including birds, tall buildings, or other aircraft.

A Look At What Comes Next

The Trump Administration recently [began](#) a program designed to iron out how state, local, and federal governments should divide regulatory responsibilities for drones. In particular, the initiative will grant approval for operations beyond current regulatory limits that involve drones flying at night, over people, and beyond operators' lines of sight. The tests aim to determine how various agencies can best cooperate on regulating commercial drones. They should also help the FAA gather considerably more information before it considers revising regulations around the line-of-sight rules and autonomous drones.

Meanwhile, the National Aeronautics and Space Administration (NASA) is [engaged](#) in a long-term research project to try and develop an air traffic management system for drones. Such a system would potentially be able to identify and track individual drones, allowing law enforcement officials to determine when drones might present a danger because of a malfunction or hack. NASA is planning to release this system by 2019 at the latest, and is allowing private companies to submit proposals for parts or all of such a setup. The agency [completed](#) the last round of tests of its own prototype for this system last June. Law enforcement officials likely view such a system as a necessity before loosening the line-of-sight requirement or ban on flying over people. That means the FAA may not change these rules until after the system's release in 2019, which would delay widespread commercial drone use in populated areas until then.

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