

## Policy Update: The Somewhat Turbulent Journey of a Delivery Drone

### Background

Once considered not much more than science fiction, unmanned aerial vehicles (UAVs), more commonly known as drones, have become increasingly prevalent in recent years. Drones are used for a wide range of activities, from carrying out military missions to taking photos, recording videos, and playing games. It was only a matter of time then until drones were used for commercial purposes as well.

Internet retail giant Amazon led the charge beginning in 2013 when the company announced its intention to launch Amazon Prime Air, a drone delivery service designed to deliver products to a customer's doorstep within 30 minutes of placing an order. As with any innovative process or technology, drone delivery faced significant practical and regulatory barriers to market entry. For starters, Section 333 of the Federal Aviation Administration's (FAA) regulations prohibits the use of drones for commercial purposes unless the party wishing to carry out the commercial activity applies for and receives a special exemption.<sup>1</sup> Applying for an exemption is a long and arduous process, prompting concerns that the

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<sup>1</sup> FMRA 2012. H.R. 685, Section 333. Retrieved from, [https://www.faa.gov/uas/legislative\\_programs/section\\_333/](https://www.faa.gov/uas/legislative_programs/section_333/)

process itself may stifle innovation and research into new drone technology. Case in point, there are currently more than 16,000 applications pending.<sup>2</sup>

### Stormy Skies

Responding to the rising popularity of drones for both leisure and commercial use, Congress ordered the FAA to promulgate regulations to integrate drones into the same airspace as commercial planes by September 2015 under the FAA Modernization and Reform Act of 2012.<sup>3</sup> Unfortunately, this deadline was not met.

While many companies opted to operate in the commercial drone space, Amazon's plan to create a drone fleet to deliver goods was perhaps one of the most innovative and expansive. According to Amazon, the company's most current prototype weighs less than 55Lb and can fly up to 15 miles at a speed of 55Mph and an altitude of 400Ft.<sup>4</sup> They are also equipped with basic obstacle avoidance technology and can automatically search for a safe place to land once reaching their

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<sup>2</sup> Regulation.gov. Section 333, FAA. Retrieved from, <https://www.regulations.gov>

<sup>3</sup> FMRA 2012. H.R. 685, Section 332. Retrieved from, <https://www.gpo.gov>

<sup>4</sup> Amazon. Amazon Prime Air. Retrieved from, <http://www.amazon.com>

destination.<sup>5</sup> The only serious limitation on these drones' commercial prospects is that they can only carry packages of 5Lb or less.<sup>6</sup>

After developing multiple prototypes in 2015, Amazon applied for a FAA exemption to test their practical capabilities, however the approval process took so long that they had to file a second application, which was finally granted in April 2015.<sup>7</sup> The exemption permitted drones to operate on private property, and within sight of the remote pilot, at altitudes as high as 400Ft and at speeds up to 100Mph while always keeping a minimum of 500Ft between the drone and the general public.<sup>8</sup>

### Foreign Invasion?

While Amazon received its permit in April 2015, little known Australian start-up Flirtey already had a head start. The company conducted the first federally approved drone delivery test in July 2015 as a part of a joint venture called "Lets Fly Wisely" between NASA, Virginia Tech and Flirtey.<sup>9</sup> The FAA approved various exemptions for this particular test run, which involved delivering medical supplies to a rural community in Virginia.

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<sup>5</sup> Ibid.

<sup>6</sup> Ibid.

<sup>7</sup> Jansen, Bart. (2015). USE Today. *FAA Approves Amazon Drone Research Again*. Retrieved from, <http://www.usatoday.com/story/money/2015/04/09/faa-amazon-drone-approval-prime-air/25534485/>

<sup>8</sup> Ib id.

<sup>9</sup> Vanian, Jonathan. (2015). Fortune. *Drone Makes First Legal Doorstep Delivery In Milestone Flight*. Retrieved from, <http://fortune.com/2015/07/17/faa-drone-delivery-amazon/>

Once again in March 2016, Flirtey beat Amazon to the punch, conducting the first urban drone delivery.<sup>10</sup> The test was approved by the FAA and was significant because this was the first time the FAA approved testing of drone deliveries in an urban environment. Approval was also granted for the drone to navigate without continuous manual handling and line of sight from the pilot.<sup>11</sup>

### A Regulatory Boost

The September 2015 Congressional mandate having already passed, the FAA is yet to release a suite of regulations to approve and govern commercial drone use, which the agency initially estimated would be completed by early 2016.<sup>12</sup> It is worth noting Flirtey was involved in both tests conducted in partnership with the FAA regarding how small-scale unmanned aircraft systems behaved. The data from these studies are being used to draft new FAA regulations on commercial drones.<sup>13</sup>

In February 2016, the FAA appointed a 27-member committee inclusive of

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<sup>10</sup> Vanian, Jonathan. (2016). Fortune. *This Drone Startup Just Achieved A Milestone In Doorstep Delivery*. Retrieved from, <http://fortune.com/2016/03/25/flirtey-drone-legal-delivery-urban/>

<sup>11</sup> Ib id.

<sup>12</sup> Guillot, Craig. (2016). SAGE Business Researcher. *Commercial Drones*. Retrieved from, <http://businessresearcher.sagepub.com/sbr-1775-98070-2712846/20160118/commercial-drones>

<sup>13</sup> Boyle, Alan. (2016). GeekWire. *Flirtey Makes First Urban Drone Delivery In FAA Test Beating Amazon To The Punch*. Retrieved from, <http://www.geekwire.com/2016/flirtey-makes-an-urban-drone-delivery-in-faa-test-beating-amazon-to-the-punch/>

drone producers, operators and other interested parties to come up with recommendations for new regulations on commercial drones.<sup>14</sup> Adding legitimacy to the matter, in March 2016, the Senate FAA reauthorization bill included a provision, which called for the FAA to establish rules for commercial deliveries within the next two years.<sup>15</sup>

In early April, responding to the changing regulatory environment and increased number of exemption applications received, the FAA announced the pending regulations on commercial drone use would be complete within a couple of months. The regulations would also loosen restrictions on drone use above populated areas, based on the recommendations of the 27-member committee.<sup>16</sup>

## Using Innovation to Regulate Innovation

As commercial drone use becomes more prevalent, regulators will likely struggle to identify the best methods for allocating airspace. A recent article

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<sup>14</sup> Lowy, Joan. (2016). Associated Press. *FAA Writing Rules For Commercial Drone Flights Over People*. Retrieved from,

<http://www.bigstory.ap.org/article/6d7a9d50d16f490aa6abae32415cfaf1/faa-writing-rules-commercial-drone-flights-over-people>

<sup>15</sup> McNabb, Miriam. (2016). DroneLife. *FAA Reauthorization Passes Senate: What's Inside For Drone Industry?* Retrieved from,

<http://dronelife.com/2016/04/20/faa-reauthorization-passes-senate-whats-inside-drone-industry/>

<sup>16</sup> Lowy, Joan. (2016). Associated Press. *FAA Writing Rules For Commercial Drone Flights Over People*. Retrieved from,

<http://www.bigstory.ap.org/article/6d7a9d50d16f490aa6abae32415cfaf1/faa-writing-rules-commercial-drone-flights-over-people>

in Techcrunch offered a “smart market” system a potential solution.

According to the article, this system relies on operating regulations and natural congestion to automatically regulate usage without imposing limits on quantity or flight path.<sup>17</sup> Functionally, this system operates similarly to electricity markets, by using “an auction that relies on mathematical optimization to resolve complex rules associated with allocating a resource.”<sup>18</sup>

In the allocation of electricity operated under a smart market, a software program takes into consideration demand requirements and then analyses bids submitted by energy suppliers to permit the necessary electricity to be supplied by the cheapest producer.<sup>19</sup> This ensures the grid isn’t overloaded and that no single player has a monopoly over service. The system also pushes for innovation, efficiency and competition. A similar mechanism in the drone sphere could use flight paths and times instead of prices to allocate airtime.

## The Future

It is impossible to predict where drone technology will lead us in the next couple of years. While encouraging innovation and creativity, regulators must also ensure that

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<sup>17</sup> Manheim, David. (2016). TechCrunch. *Regulating Drone Airspace Using Smart Markets*.

<http://techcrunch.com/2016/04/19/regulating-drone-airspace-using-smart-markets/>

<sup>18</sup> *Ib id.*

<sup>19</sup> *Ib.*

proper safety standards are in place to protect consumers, producers, the environment, and the general public. The upcoming regulations should reflect collaboration with all interested parties to ensure that out of the box ideas – like smart markets – are considered when putting a regulatory framework in place.

*The Alliance for Innovation and Infrastructure (Aii) consists of two non-profit organizations, The National Infrastructure Safety Foundation (NISF) a 501(c)(4), and the Public Institute for Facility Safety (PIFS) a 501(c)(3). The Foundation and the Institute focus on non-partisan policy issues and are governed by separate volunteer boards working in conjunction with the Alliance's own volunteer Advisory Council.*