
WHO'S PROTECTING WHOM? AN ANALYSIS OF THE NEWEST FEDERAL
AVIATION ADMINISTRATION'S UNMANNED AERIAL VEHICLE
REGULATIONS AND RESTRICTIONS AND THEIR HINDRANCE TO
TECHNOLOGICAL ADVANCEMENT

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I. Introduction

The first Unmanned Aerial Vehicles (“UAVs”) that existed were bulky and loud with little known uses outside of militant ones.¹ While the military mostly used UAVs as aerial missiles, they soon grew in popularity amongst the few hobbyists who could afford them.² Initial uses of UAVs ranging from surveillance purposes to reconnaissance missions prevented widespread public acceptance and absorption in this automotive technology.³ Until recent years, the

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¹ See Andrew M. Anderson, *Look, Up in the Sky!: Regulating Drone Use to Protect Our Safety and Privacy*, 88 TEMP. L. REV. ONLINE 48, 50 (detailing the initial uses of drones for military purposes); see also Kashyap Vyas, *A Brief History of Drones the Remote Controlled Unmanned Aerial Vehicles (UAVs)*, INTERESTING ENGINEERING (Jan. 2, 2018), archived at <https://perma.cc/Y9LC-XUFS> (summarizing the history of UAVs).

² See Anderson, *supra* note 1, at 51 (reiterating some of the original uses of drones).

³ See Timothy M. Ravich, *Grounding Innovation: How Ex-Ante Prohibitions and Ex-Post Allowances Impede Commercial Drone Use*, 2018 COLUM. BUS. L. REV. 495, 497 (stipulating initial militant uses of drones and the effect there was on perception and consequent acceptance of the technology). The author examines the fluctuations in the public perception of drones from when their only uses were found in the military to when the technology became more widely available for civil and commercial uses. *Id.* at 498.

technology for automated flights was only used in large aircrafts and difficult to mass-produce.⁴

The more notorious name for a UAV is a drone, which are now as common as snow in Alaska.⁵ The term “drone” originated from a comparison of the aircrafts to worker bees in 1935, but today is generally interchangeable with the term UAV.⁶ Most people are surprised by the historical timeline of UAVs, which dates as far back as the early 1800s when drones were first used by military leaders seeking to spy on or attack enemies from a distance.⁷ Drone technology made a significant advancement in 1982 when Israeliforces

⁴ See Anderson, *supra* note 1, at 51 (establishing how the technology for automated flights advanced and became easier to mass-produce). The online community called DIY Drones enabled people to start sharing the code and designs used in autonomous aircrafts. *Id.* With the advancement of technology, “a number of private companies have arisen that are devoted to manufacturing UAVs and the hardware required to fly them.” *Id.*

⁵ See Kelsey D. Atherton, *The FAA Says There Will Be 7 Million Drones Flying Over American by 2020*, POPULAR SCIENCE (Mar. 24, 2016), archived at <https://perma.cc/5JUX-W3G2> (discussing the popularity of drones in 2016). See also Craig Smith, *25 Interesting Drone Statistics and Facts (2019) By the Numbers*, DMR (Oct. 13, 2018), archived at <https://perma.cc/H3V2-272C> (illustrating specific drone statistics as of June 2019). According to drone projections, the estimated number of drones that will be flying the United States by 2020 is seven million. *Id.* See also Amelia Traynor, *Why Does Alaska Get So Much Snow?*, SNOW BRAINS (Nov. 23, 2018), archived at <https://perma.cc/2PYV-TYUB> (reiterating the amount of snow Alaska regularly gets and potential reasons why). “Alaska gets a ton of snow. Possibly the most snow on Earth.” *Id.*; see also *Average Annual Snowfall in Alaska*, CURRENT RESULTS (2018), archived at <https://perma.cc/X9HT-VY7E> (describing the average annual snowfall in Alaska).

⁶ See Anderson, *supra* note 1, at 50 (giving a more detailed history of drones and the origin of the term drone).

⁷ See Anderson, *supra* note 1, at 49 (outlining the expanding use of drones, starting from being used for militant purposes). The use of drones “arose from military leaders’ desires to spy on or attack enemies from a distance without risking human lives.” *Id.*; see also *The History of Drones (Drone History Timeline From 1849 To 2018)*, DRONETHUSIAST (Nov. 25, 2018) [hereinafter *The History of Drones*], archived at <https://perma.cc/QL4Z-NZMQ> (giving a basic historical timeline of the history of militant and commercial drones). The first recorded usage of drones was documented in 1893 “when Austrian soldiers attacked the city of Venice with unmanned balloons filled with explosives.” *Id.* Today, military drones are typically used for combat surveillance and tactical reconnaissance. *Id.*

used them in battle with the Syrian Air Force and incited an international interest in drones.⁸

As awareness in drones grows and technology advances, use amongst consumers continues to develop beyond militant weaponry.⁹ Drones are now used by many entities for a multitude of reasons, including bolstering recreational use amongst hobbyists and commercial use by companies and government agencies, such as the National Aeronautics and Space Administration (“NASA”) and the National Oceanic and Atmospheric Administration (“NOAA”).¹⁰ There are seemingly endless possibilities and opportunities that arise from drone technology.¹¹ Companies, such as Amazon, are advertising a service called “Prime Air” in which drones can carry deliveries to customers in thirty minutes or less.¹² To further finding new commercial drone uses, a formal organization was established in 2011 called the Professional Society of Drone Journalists.¹³ The focus of the society is “developing small drones and exploring best practices

⁸ See Vyas, *supra* note 1; see also *The History of Drones*, *supra* note 7 (illustrating when the capabilities of drone technology were realized).

⁹ See Jennifer Urban, *What Is the Eye in the Sky Actually Looking at and Who is Controlling It? An International Comparative Analysis on How to Fill the Cybersecurity and Privacy Gaps to Strengthen Existing U.S. Drone Laws*, 70 FED. COMM. L. J. 1, 3 (May 7, 2017) (advancing how the uses of drones have grown beyond what society believes drones are typically used for). Most people who have a considerably basic understanding of drones believe that the uses do not extend beyond military purposes or for recreational use by people involved in the technology industry. *Id.* See also *The History of Drones*, *supra* note 7 (reiterating the history of when drones began being used for non-military purposes). It is proposed that non-military uses for drones began in 2006 by government agencies and corporations. *Id.* “As unmanned aerial vehicle technology improved in the military sector, those same technological improvements could be used in the private sector.” *Id.*

¹⁰ See Elizabeth Howell, *What Is A Drone?*, SPACE.COM (Oct. 3, 2018), *archived at* <https://perma.cc/6AYF-BWMP> (describing the different types of drones that are most common and their uses). Drones are still used for military purposes, but the use of drones has now expanded in options “allowing ordinary people to fly these small planes for all sorts of purposes – photography, recreation and in some cases, surveillance.” *Id.* “Drones can also be used for applications such as distributing fertilizers to farmers’ fields or keeping an eye on remote pipelines.” *Id.*

¹¹ See *id.* (describing different ways drones may be used).

¹² See *id.* (outlining an example of a potential future service that drones may be used for).

¹³ See Anderson, *supra* note 1, at 52 (introducing an organization whose purpose is to expand drone technology knowledge and use among different industries).

for their use in investigative, weather, sports, and other types of reporting.”¹⁴

Akin to most technological advancements, the mass production of drone technology brought about negative and positive uses of different varieties.¹⁵ An instance of misappropriation of the drone technology is its use in smuggling drugs over international borders and aid in the overall transportation of such illegal drugs.¹⁶ Nevertheless, one of the more promising uses for drones is the potential for their increased role in emergency situations.¹⁷ As of May 13th, 2018, at least sixty-five people had been saved by drones and another nineteen people were found or helped by drones in situations that posed great risk to their health and safety.¹⁸ Search and rescue missions, disaster relief efforts, medical aid, and countless other emergency situations are areas that drone technology can and should continue to be used for public aid.¹⁹

¹⁴ See Anderson, *supra* note 1, at 52 (providing examples of burgeoning commercial drone uses). Various universities also started implementing drone journalism programs which sought to teach students how drones can be used for reporting purposes. *Id.* The uses for drones grew exponentially after the technology became more affordable. *Id.* at 51. “Some individuals use the drones for tracking wildlife, mapping crops, and surveying terrain for 3-D modeling or even search and rescue purposes.” *Id.* at 52.

¹⁵ See Dianna Labrien, *6 Harmful Ways People Are Using Drones*, TECH.CO (July 14, 2016), archived at <https://perma.cc/V8QQ-59TU> (detailing ways that drones can be used positively and harmfully). The text sets forth a number of negative implications of drone use, including illegal and invasive interferences. *Id.*

¹⁶ See *id.* (providing an example of a drone being used to smuggle drugs close to the US/Mexican border). “Another drone was caught with 28 pounds of heroin when trying to pass over the border close to San Diego in April last year.” *Id.*

¹⁷ See Howell, *supra* note 10 (recalling how government agencies applied drone operations for safety reasons). “One example was the Hurricane and Severe Storm Sentinel (HS3), which was a five-year test program using unmanned surveillance aircraft called Global Hawks.” *Id.*

¹⁸ See Malek Murison, *DJI: Drones Rescued More Than 65 People in the Last Year*, DRONE LIFE (Apr. 30, 2018), archived at <https://perma.cc/5WN2-K5E8> (describing the DJI recent report on how drone technology aided in health and safety matters). “The focus is on how improved drone technology and increased use by first responders and emergency services have combined with advancing aviation regulations over the past twelve months.” *Id.*

¹⁹ See *id.* (discussing how drone operations can impact emergency efforts).

The developments in commercial drone technology and application spark trepidation by some who believe there will be greater harm than good.²⁰ Irresponsible drone users are to blame for this apprehension because they have exploited drone technology in harmful ways leading to mistrust in allowing drone usage to continually expand.²¹ By allowing commercial drones the opportunity to “fly freely,” people’s privacy, security and potentially lives are put at risk.²² Accordingly, the biggest challenge in setting limitations on drone operations is deciding who should be in charge of setting forth standard regulations and restrictions involving drone usage to ensure protection of people’s interests.²³ The question is whether regulations should be decided by state legislation, federal legislation, or if it is under the Federal Aviation Administration’s (“FAA”) jurisdiction.²⁴

This Note analyzes the limitations on commercial drone use and specifically how regulations deter drone technology from being a valuable contribution to society. Part II provides a brief history of UAV, specifically the legal issues surrounding the regulation of drone operations by the FAA. Part III examines the regulation of commercial drones and how they relate to drone technological and operational advancements. Part IV analyzes the inherent uses of drone technology

²⁰ See Lane Page, *Drone Trespass and the Line Separating the National Airspace and Private Property*, 86 GEO. WASH. L. REV. 1152, 1154–55 (2018) (illustrating how problematic increased commercial drone-use flying in the national airspace could be).

²¹ See Labrien, *supra* note 15 (outlining negative implications and uses of drones).

²² See Page, *supra* note 20, at 1159 (discussing trespass and privacy roles under the FAA’s 2016 rule). “The rule does not address privacy or trespass at all, which are two of the largest concerns that the American public has with drones.” *Id.* See Urban, *supra* note 9, at 11 (deliberating how cybersecurity is also at risk by increased commercial drone use). “According to researchers at the National Research Foundation of Korea, drones are highly susceptible to cybersecurity issues because they have a ‘highly exposed technical system due to the unique configuration such as open state of the sensors at all times, wireless network, serially safety structure, etc.’” *Id.* See also Anderson, *supra* note 1, at 55–56 (giving examples of how increased commercial drone use can pose a threat to public safety and other aircrafts by inexperienced or reckless users).

²³ See Page, *supra* note 20, at 1163 (reiterating how there is ambiguity behind who regulates property rights). “Because it is unclear how far airspace property rights extend, low-altitude airspace—the airspace where drones will be flying—is currently a ‘property rights no-man’s land.’” *Id.* See also Anderson, *supra* note 1, at 63 (questioning whether it is truly the FAA that is able to regulate commercial drone use).

²⁴ See Anderson, *supra* note 1, at 61–65 (stressing how authority over drone regulation has been muddled in the past).

in all facets of the commercial industry, identifying specific inadequacies in the current regulations and how they pose a hindrance to developing commercial drone application. This Note aims to show regulating commercial drones is a necessity for privacy and safety purposes, but the practices in place are not an ideal model for promoting future drone technology and innovation. Improvements to the current regulations, to protect both society and technological advancement of drones are discussed in Part V.

II. History of UAVs

Drone usage was originally utilized by the military, and through the years has transgressed to usage by governmental agencies, corporations, and private individuals for recreational purposes.²⁵ Starting in 2006, the FAA began to grant commercial drone permits and essentially initiated the flourishing in non-militant drone usage.²⁶ The rapid increase in the number of commercial drone permits granted by the FAA was substantial and showed no sign of slowing down.²⁷ However, the influx of commercial drone permits

²⁵ See *The History of Drones*, *supra* note 7 (detailing the beginning uses of non-military drones). “Government agencies for disaster relief, border surveillance and wildfire fighting, while corporations began using drones to inspect pipelines and spray pesticides on farms.” *Id.* See also Urban, *supra* note 9, at 3 (describing specific purposes drones have served in history).

UAVs are being used for many different purposes ranging from the National Aeronautics and Space Administration's (“NASA’s”) use of a drone to collect data and monitor Hurricane Matthew, to construction companies’ use of drones to map out and supervise large construction projects in order to cut their labor time from months down to minutes.

Urban, *supra* note 9, at 3.

²⁶ See *The History of Drones*, *supra* note 7 (describing one of the factors that played a part in the expansion of recreational drone use).

²⁷ See *id.* (setting forth the number of commercial drone permits that the FAA has granted in years past). “In 2015, the FAA issued 1000 drone permits, a number which more than tripled to 3100 permits in 2016 and which has continued to grow in the time since.” *Id.* See also Ajoke Oyegunle, *Drones in the Homeland: A Potential Privacy Obstruction Under the Fourth Amendment and the Common Law Trespass Doctrine*, 21 COMMLAW CONSPECTUS 365, 367–68 (2013) (predicting the number of drones that will be operating in the future). “As many as 30,000 drones are expected to operate in U.S. airspace by 2030.” *Id.* at 367–68. See also Page, *supra* note 20, at 1154 (describing the effects FAA rules could have on an increase

brings with it a growing number of concerns for citizens, such as fears over aerial trespassing and the challenge of how to protect privacy rights.²⁸

A. Boggs v. Merideth

The latest dignitary legal issue to arise from increased drone usage occurred on July 26, 2015 in the case of *Boggs v. Merideth*.²⁹ Defendant Merideth used a shotgun to shoot down the drone Plaintiff Boggs was flying over Merideth's backyard.³⁰ Boggs made a trespass to chattels claim under Kentucky state law and asserted that Merideth did not own the airspace above his property because unmanned aircrafts are governed by federal law, so Boggs was operating in "navigable airspace" and Merideth, therefore had no right to shoot his drone down.³¹

in drone operators). In 2016, the FAA set forth a new small-drone rule allowing more drones to be used for recreational and commercial purposes. *Id.* at 1154–55. "Around 670,000 operators registered their drones in 2016, and the FAA expects operators to purchase around 7,000,000 drones, for both commercial and recreational use, by 2020." *Id.* at 1155.

²⁸ See Anderson, *supra* note 1, at 55 (affirming some of the concerns of citizens brought about by the increased drone usage). See Page, *supra* note 20, at 1152 (outlining issues the FAA's small drone rule will bring without specific regulations and definitions). "The limits on where aircraft can fly and where landowners' property rights extend are becoming murky and problematic." *Id.* See also Urban, *supra* note 9, at 3–4 (setting forth other concerns not related to privacy issues). Violation of privacy seems to be the forefront of concerns when discussing drone usage, but cybersecurity is also one that may be added to the list. *Id.* A study employed by a research team at the University of Texas at Austin revealed that "it is not very difficult for a drone to be hacked and the realization that many cybersecurity implications that could come from this." *Id.*

²⁹ See *Boggs v. Merideth*, No. 3:16-CV-00006-TBR, 2017 U.S. Dist. LEXIS 40302, at *1–2 (W.D. Ky. Mar. 21, 2017) (giving the legal facts of the case). Plaintiff, Boggs was flying his drone over defendant, Merideth's backyard in Bullitt County, Kentucky when Merideth shot the drone down with a shotgun. *Id.* See also Annie Sneed, *So Your Neighbor Got a Drone for Christmas*, SCIENTIFIC AMERICAN (Dec. 22, 2015), archived at <https://perma.cc/NEA9-YWEU> (detailing the events that took place in *Boggs v. Merideth*). "When the drone flew over his property, he blasted it down." *Id.* at 2. See also Andrew Blake, *Drone owner files federal lawsuit after neighbor downs craft with shotgun*, WASH. TIMES (Jan. 6, 2016), archived at <https://perma.cc/UK4X-K7CB> (describing the lawsuit that arose from the incident).

³⁰ See *Merideth*, 2017 U.S. Dist. LEXIS 40302, at *1 (providing an explanation of the events leading up to the case).

³¹ See Page, *supra* note 20, at 1154 (detailing the argument Boggs gave for why he was legally allowed to fly his drone over Merideth's property). Initially, the state

Boggs makes several arguments as to why the alleged federal question is substantial, including that a resolution of the issue will have an impact on federal aviation law, the FAA's ability to regulate air safety and navigation, and the developing body of law regarding the impact of unmanned aircrafts on privacy and property interests.³²

The Court dismissed the case for lack of subject matter jurisdiction and avowed that the FAA does have an interest in enforcing regulations to govern the federal airspace, but they have a very limited interest in applying them to Boggs's state law tort claim for trespass to chattels.³³

Prior to *Boggs v. Merideth*, the authoritative case discussing the regulation of UAV operations was decided in 1946 in *United States v. Causby*³⁴, indicating the deficiency of legislative precedent on this matter.³⁵ The respondents in *Causby* owned 2.8 acres of property near an airport in Greensboro, North Carolina used mainly to operate a chicken farm business.³⁶ The respondents argued that they were forced to shut down their chicken business because the various aircraft

district court ruled for Merideth claiming he had a right to shoot the drone down, but Boggs then filed a complaint with the federal district court arguing against that judgment. *Id.* at 1153–54. Boggs contended that “the state court's ruling conflicted with the exclusive jurisdiction of the Federal Aviation Administration (“FAA”) over the navigable airspace, which should result in federal law preempting Kentucky law.” *Id.* at 1154. *See also Merideth*, 2017 U.S. Dist. LEXIS 40302, at *2 (asserting Boggs' defense against Merideth and stipulations that the federal government regulates unmanned aerial vehicle usage).

³² *See Merideth*, 2017 U.S. Dist. LEXIS 40302, at *10 (quoting the arguments Boggs makes).

³³ *See id.* at *11–24 (maintaining the court's reasoning behind dismissing Boggs' case and the argument that the FAA controls UAV operations).

³⁴ *See United States v. Causby*, 328 U.S. 256, 258 (1946) (indicating that this is a first impression case). This case involved plaintiff, Causby's complaint that 150 of his chickens died because the army's aircrafts flew so low over his land it caused his chickens to become terrified and fly into the wall of their coop. *Id.* at 259. *See also Sneed*, *supra* note 29 (describing the facts and holding of the case at bar).

³⁵ *See Urban*, *supra* note 9, at 5 (referencing and describing *United States v. Causby*). *See also Sneed*, *supra* note 29 (illustrating why airspace has not been a major legal issue until recently). “Until recently, people have had little reason to care what happens in the air above their property: there hasn't been enough going on at low altitudes for them to notice.” *Id.*

³⁶ *See Causby*, 328 U.S. at 258–59 (detailing the background of the case).

operators caused such a disruption to their farm that as many as six to ten chickens were killed in a day, and 150 chickens overall died from being so startled by the aircraft noise.³⁷ The dialogue on the outcome paled in comparison to the importance of what the case represented overall.³⁸ *Causby* was the first case to address the probable influx of legal issues that were likely to arise following the insurgence of commercial drone.³⁹

B. Small Unmanned Aircraft Regulations

As a response to *Boggs v. Merideth*, many citizens postulated concerns over how privacy and property rights would be protected.⁴⁰ The FAA appeared to acknowledge these concerns in 2016 when a new set of rules for small-drones, Part 107–Small Unmanned Aircraft Systems (“Part 107”) was passed.⁴¹ As a response, regarded Part 107 as established guidelines meant to protect individuals’ right to privacy and other interests.⁴² Instead of minimizing concerns however, the rules opened the floodgates for every individual seeking commercial

³⁷ See *id.* at 259 (recalling the arguments respondents used in the case).

³⁸ See Sneed, *supra* note 29 (quantifying the importance of the case).

³⁹ See *id.* (recognizing what *Boggs v. Merideth* demonstrates regarding clarity on airspace rights). “Until the federal government or federal courts clarify the boundaries of airspace property rights and FAA jurisdiction, questions like those presented in *Boggs v. Merideth* will remain unanswered.” See also Page, *supra* note 20, at 1154.

⁴⁰ See Linda Chiem, *FAA Oks Small Drones But Leaves Big Questions Hovering*, LAW360 (June 21, 2016), archived at <https://perma.cc/VFT5-VB35> (detailing a likely intention behind the FAA’s new small-drone rules). “[T]he Federal Aviation Regulations, lays out a sweeping set of regulations attempting to balance public safety concerns with the industry’s desire to deploy drones more quickly.” *Id.*

⁴¹ See *id.* (describing the new set of small-drone rules the FAA passed). See generally David J. Williams, *UAS in the USA: A History of Drone Regulations*, NYC AVIATION (Dec. 24, 2018), archived at <https://perma.cc/GH6E-V7JZ> (giving an overview of the history of drone regulation). See also Les Dorr, *Fact Sheet - Small Unmanned Aircraft Regulations (Part 107)*, FED. AVIATION ADMIN. (July 23, 2018), archived at <https://perma.cc/95CE-GK25> (describing the rules set forth in Part 107 of the FAA’s rules for UAS operations). See also Andrea O’Sullivan, *The Good and the Bad of FAA Reauthorization: Drone Policy*, MERCATUS CENTER (Nov. 6, 2018), archived at <https://perma.cc/2PQR-PHLV> (opining the pros and cons of the Reauthorization Act and how they will affect drone usage).

⁴² See Williams, *supra* note 41 (reiterating intentions behind Part 107 and how it works as a regulatory framework for flight operations). Drone users were given informational packets detailing the guidelines set forth in Part 107 with each purchase of a newer model drone. *Id.*

drone permits.⁴³ People who regularly fly drones, like commercial users and hobbyists, gave a lot of praise to the FAA for these new rules as they allowed easier access to permits.⁴⁴

Prior to the passing of the new regulations, there were only three options given to those who sought to operate a commercial drone.⁴⁵ To pilot a commercial drone, an individual was required to:

- (1) apply for and obtain an exemption from the supervision and registration requirements of the Federal Aviation Act...;
- (2) obtain an airworthiness certificate and operate the aircraft by a pilot pursuant to an operating certificate; or
- (3) obtain a Certificate of Waiver or Authorization from the FAA and operate the UASs [Unmanned Aircraft System] pursuant to the terms of such Certificate of Waiver of Authorization.⁴⁶

The steps set forth above for operating commercial drones either stalled or precluded several users because they could not meet the

⁴³ See Page, *supra* note 20, at 1158 (setting forth how the new rule will likely lead to drastic changes in drone operating). Prior to the rule going into effect in August 2016, commercial drone use was not permitted without users applying for specific authorization. *Id.* at 1156. Due to the procedure required to acquire a commercial drone permit, the number of commercially operated drones was very limited. *Id.* at 1157. See also Chiem, *supra* note 40 (giving an overview of the FAA's new small-drone rule). "With the rule, the FAA is opening up the skies for certain small drones weighing 55 pounds or less for commercial purposes by establishing flexible procedures for certified operators to handle the flying of drones, provided they pass a test and are vetted by the Transportation Security Administration." *Id.*

⁴⁴ See Chiem, *supra* note 40 (outlining specific parties who welcomed the FAA's new rule); see also Page, *supra* note 20, at 1158 (describing the many new uses for drones that would be allowed after the change in the FAA's drone regulations). Since the FAA made commercial drone permits easier to access, the number of uses for drones became endless and excited those who saw the potential. *Id.* "The Association for Unmanned Vehicle Systems International estimated that the drone industry could create 100,000 jobs and add \$82 billion to the U.S. economy over the next decade." *Id.* at 1158–59.

⁴⁵ See Urban, *supra* note 9, at 9 (detailing the required procedures to partake in commercial UAS operations).

⁴⁶ See *id.* (listing the three ways to pilot an unmanned aerial system).

standards.⁴⁷ After the new rules went into effect on August 29th, 2016, commercial entities were able to operate a drone without having to individually petition for an exemption.⁴⁸ So long as commercial drone users met the requirements set forth in the new rule, they were allowed to legally operate in the National Airspace System without a waiver.⁴⁹

Even though the new rule allowed for easier access to operating permits, they still did not include explicit restrictions and regulations regarding operating drones by commercial entities.⁵⁰ As a response, drone users stipulated the rules did not adequately set forth basic and necessary regulations or rulemaking in other important drone operation areas that needed to be deliberated, including rules that protect people's privacy interests.⁵¹ The new rules were said to lack the restrictive language or boundaries that may appease the minds of citizens concerned about their privacy rights and want to be protected from trespassing drones.⁵² Many sources agree that the FAA's 2016

⁴⁷ See Page, *supra* note 20, at 1157 (indicating how prior to the small-drone rule users had to jump through various hoops just to operate a drone commercially).

⁴⁸ See *id.* (discussing the effect of the new small-drone rule and applying for a permit to operate). The standards prior to the new small-drone rule made it that much more difficult for drone operators looking to use drones for commercial purposes. *Id.* Once the new rules were passed and the application for permits lessened, people had the ability to be innovative and creative with how they might use a drone in their commercial operations. *Id.*

⁴⁹ See *id.* (setting forth the new ways in which commercial entities could be granted approval by the FAA).

⁵⁰ See *id.* at 1157–58 (setting forth a description of some of the requirements enacted in the new rule). Some of the requirements described in the new rule include “a fifty-five-pound weight limit, operation only within the visual line of sight of the remote pilot, operation only during daylight or civil twilight, operation only within class G airspace without Air Traffic Control permission, no operations above people who are not directly participating in the operation.” *Id.* at 1157. “The new rule does place some important, if burdensome, restrictions on drone use, but overall it will make it much easier for commercial drones to fly in the national airspace.” *Id.* at 1158.

⁵¹ See Chiem, *supra* note 40 (proscribing that even though the new small-drone rules were applauded by some users, there were still gaps in the restrictions that should have also been addressed).

⁵² See *id.* (asserting how the rules do not address concerns over problem areas with commercial drone usage). The FAA contended that stricter regulations regarding areas such as privacy protections and manufacturing specifications were “beyond the scope of its small-drone rulemaking authority and are likely to be tackled in upcoming legislation to reauthorize the FAA or through the promulgation of future additional rules.” *Id.* See also Page, *supra* note 20, at 1152 (stipulating the implications unregulated drone usage will bring). “This conflict will result in drone trespass remaining unregulated, leaving landowners and drone operators without any clear answer as to who is allowed to be where.” *Id.*

small-drone rule incited more questions than answers regarding regulation and privacy protection.⁵³

C. The Federal Aviation Administration's Authority

The FAA's 2016 small-drone rule set forth minimal and ambiguous suggestions for regulations addressing privacy guidelines.⁵⁴ In one of the few times privacy issues were addressed by the FAA, they plainly stated, "[t]he FAA is acting to address privacy considerations by providing all drone users with recommended privacy guidelines as part of the UAS registration process and through the FAA's B4UFLY mobile app."⁵⁵ However, the FAA continually specifies they will not enforce regulations over matters they believed to be outside their realm of responsibility.⁵⁶ For example, the FAA did not enforce a strict standard for manufacturing specifications because they maintain that any issues relating to the condition of drones should be regulated by the drone operators themselves.⁵⁷ The FAA flagrantly also opposed taking responsibility for enforcing legislation related to privacy or trespass matters, insisting the states have that authority.⁵⁸

⁵³ See Page, *supra* note 20, at 1159 (highlighting that the FAA's 2016 rule does not regulate privacy nor trespass concerns).

⁵⁴ See Chiem, *supra* note 40 (describing how the FAA addressed privacy considerations by providing privacy guidelines and information on educating commercial drone pilots).

⁵⁵ See *id.* (illustrating one way the FAA tried to address privacy concerns after announcing the new drone regulations). "The FAA is building on the privacy "best practices" the National Telecommunications and Information Administration published last month in anticipation of the small-drone rule." *Id.*

⁵⁶ See *id.* (signaling different areas that the FAA believes they should not be responsible for regulating).

⁵⁷ See *id.* (stipulating how it is the drone operator's responsibility to ensure the drones are safe to fly). "[T]he FAA is not requiring small UAS to comply with current agency airworthiness standards or aircraft certification. Instead, the remote pilot will simply have to perform a preflight visual and operational check of the small UAS to ensure that safety-pertinent systems are functioning properly." *Id.* By asserting this, the FAA is suggesting that they should not be involved in regulation matters where there are parties that are more properly equipped with the information and knowledge to address these issues. *Id.* In other words, the FAA is stating that it is the drone operator's problem to practice safe drone operations. *Id.*

⁵⁸ See *id.* (discussing how the FAA believes state and local trespass laws are better suited to address the concerns of the American public). See also Page, *supra* note 20, at 1159 (addressing potential issues for federal preemption of drone laws). "In

There has been no jurisdictional clarity regarding who determines airspace property rights and today there still are none in existence.⁵⁹ Typically, it is state laws, not federal, that determine property rights.⁶⁰ There have been states that attempted to address the regulation of commercial drone uses.⁶¹ In Wisconsin, a statute was enacted to restrict any law enforcement agencies from using drones “to gather evidence or other information in a criminal investigation from or at a place or location where an individual has a reasonable expectation of privacy.”⁶² The town of Holyoke, Massachusetts enacted into the Code of Ordinances a section regulating drones to protect landowners and the city’s privacy and property interests.⁶³ The code also specifically references drones being used for recreational purposes only are not subject to regulation by the FAA, indicating the free range those drone users have in operating drones without codes.⁶⁴

its 2016 rulemaking pursuant to the FMRA, the FAA expressed its belief that it is not responsible for enforcing laws related to privacy or trespass and that this area should be left for the states.” *Id.*

⁵⁹ See Page, *supra* note 20, at 1154 (demonstrating how *Boggs v. Merideth* raises many questions regarding airspace property rights and aerial trespassing). “Until the federal government or federal courts clarify the boundaries of airspace property rights and FAA jurisdiction, questions like those presented in *Boggs v. Merideth* will remain unanswered.” *Id.* See also Sneed, *supra* note 29 (giving examples of how state and local governments started making their own aerial trespassing rules).

⁶⁰ See Sneed, *supra* note 29 (substantiating the claim the FAA makes that airspace is something that state governments typically regulate).

⁶¹ See Page, *supra* note 20, at 1155 (conferring how there have been some states who passed rules addressing drone trespass over landowner’s property). “Some common issues these laws address include the definition of ‘drone,’ how the government and law enforcement can use drones, how operators can use them for hunting and surveillance, and where they can fly.” *Id.* at 1165.

⁶² See WIS. STAT. ANN. § 175.55 (West 2020) (focusing the legislation on the use of drones by law enforcement so as to protect individuals’ privacy rights).

⁶³ See HOLYOKE, MASS. CODE § 54-22 (2020) (stressing the increase of drone usage for recreation and business purposes). A few of the operational limitations for drones used in hobby or for recreational purposes listed are that drones shall not:

operate over any persons or groups of persons not directly participating in the operation, not under a covered structure, and not inside a covered stationary vehicle, not operate except in daylight-only or civil twilight... operate over any property owned by the city, including the Holyoke water works and Holyoke gas & electric, unless prior written consent has been obtained from the city, Holyoke water works or Holyoke gas & electric.

Id.

⁶⁴ See *id.* (citing that the FAA currently does not regulate model aircrafts that are being used for recreational purposes only).

Correspondingly, there are a several states who have set forth legislation intended to prevent drones from impeding upon others privacy or property interests.⁶⁵

Paradoxically, the FAA also asserted they are in control of the airspace and their authority generally overrules state or local laws.⁶⁶ Any challenges made to state laws over drone regulations likely face federal preemption issues because of the FAA's exclusive jurisdiction over navigable airspace.⁶⁷ The FAA states that they carry the authoritative weight to decide airspace rights, but they illogically do not want the burden of actually proposing restrictions or regulations that touch upon those concerns.⁶⁸

⁶⁵ See *Current Unmanned Aircraft State Law Landscape*, NCSL (Sept. 10, 2018) [hereinafter *Current Law*], archived at <https://perma.cc/28TB-HEWH> (citing numerous states that have enacted any type of drone regulatory statutes or legislation). "At least 38 states considered legislation related to UAS in the 2017 legislative session . . . Alaska SCR 4 continues the Task Force on UAS and specifies additional membership and duties of the task force." *Id.* See also *Master List of Drone Laws (Organized by State & Country)*, UAV COACH (Mar. 19, 2019) [hereinafter *Master List*], archived at <https://perma.cc/P2X6-9PYY> (offering a non-exhaustive list of drone law links by state).

⁶⁶ See Sneed, *supra* note 29 (stipulating the FAA's sentiments on who controls airspace). The FAA released information on their views of state and local drone regulations setting forth that "[a] navigable airspace free from inconsistent state and local restrictions is essential to the maintenance of a safe-and sound air transportation system." *Id.* But see Henry H. Perritt, Jr. & Albert J. Plawinski, *One Centimeter Over my Back Yard: Where does Federal Preemption of State Drone Regulation Start?*, 17 N.C. J. L. & TECH. 307, 326 (2015) (stipulating that the Commerce Clause leads to more ambiguity in who has control over airspace and drone regulation).

The Commerce Clause prohibits states from interfering with interstate commerce, while also limiting the scope of federal power. Because drones operate in interstate commerce, the federal government may regulate their use under the authority of the Commerce Clause. Therefore, the clause draws a rough dividing line between what drone regulatory powers lie within federal authority and what lie within state authority.

Id.

⁶⁷ See Page, *supra* note 20, at 1170 (reiterating how any state laws enacted on drone regulation will likely be preempted by the FAA's authority).

⁶⁸ See *id.* at 1170–71 (outlining the FAA's stipulation that property and trespass issues are beyond the reach of their new drone rules and yet will be subject to their authoritative preemption).

Due to various legal ambiguities, the FAA holds the most authority over navigable airspace.⁶⁹ Per the Supremacy Clause, it is probable the FAA has the authority to overrule any state or municipal drone legislation.⁷⁰ The other side of this view suggests the FAA is seeking exclusive jurisdiction for regulating drone operations.⁷¹ The FAA suggested the states decide limitations for drones presumably knowing how often those limitations will be preempted by their federal law; all but ensuring the authority over drone regulation resides with the FAA.⁷² “The legal ambiguity surrounding airspace property rights and the FAA’s authority over the navigable airspace have already impacted state attempts to regulate these areas.”⁷³

To regulate drones effectively, the FAA believes there must be uniform restrictions on airspace.⁷⁴ Specifically, the FAA has stated

⁶⁹ See *id.* at 1172 (exemplifying ways in which the FAA has shown the authority they have surrounding state regulations on drones). The ambiguities regarding property rights and what exclusive control the FAA has over navigable airspace lead most states to assume that the FAA has the authority to preempt any state’s regulations. *Id.*

⁷⁰ See Perritt, Jr. & Plawinski, *supra* note 66, at 329 (citing the authority of the Supremacy Clause in allowing the FAA to nullify any state law that may conflict with federal law). Aviation safety laws, for example, are generally always preempted by Federal law due to the need for uniform and rigid safety standards so as to ensure each aircraft is operating safely at all times. *Id.* at 331–33.

⁷¹ See Page, *supra* note 20, at 1172 (establishing that without having clear distinction between federal and state jurisdictions, the FAA will be able to preempt most state’s drone regulations).

[W]ithout a clear line between federal and state jurisdictions, the FAA could see any restriction as an operational ban - for example, restriction on flight altitudes, flight paths, or the navigable airspace - or as a regulation of aircraft safety. The FAA has already said it could preempt these types of restrictions because they intrude on its exclusive jurisdiction.

Id. See also Perritt, Jr. & Plawinski, *supra* note 66, at 332 (indicating areas in which the FAA has stipulated they will generally always be allowed to preempt state law). “In early 2014, the FAA said: ‘[A] state law or regulation that prohibits or limits the operation of an aircraft, sets standards for airworthiness, or establishes pilot requirements generally would be preempted.’” *Id.*

⁷² See Page, *supra* note 20, at 1172 (demonstrating cases in which state drone regulations will likely be preempted by federal law). The FAA suggested that “states consult with the FAA before creating laws relating to drone restrictions on flight altitude, flight paths, operational bans, and any regulations on the navigable airspace because of the high probability that federal laws will preempt them.” *Id.* at 1170.

⁷³ See *id.* at 1172 (detailing steps different states have taken in drone regulation).

⁷⁴ See *id.* (determining what the FAA believes will be most effective in regulating aerial trespass). “The FAA has already stated that a federal court will ‘strictly

“states cannot place regulations on flight altitude, flight paths, or the navigable airspace.”⁷⁵ Restrictions on statutory regulations has caused states to either reject or modify their own regulations because they fear the laws may face future preemption problems.⁷⁶ In theory, even though the FAA articulates states may pass trespass and privacy regulations, they will have many issues doing so because the FAA’s jurisdiction is seemingly overarching.⁷⁷

III. Facts

As discussed previously, the legislative history on drone regulation is limited and ambiguous.⁷⁸ Prior to a rule passed in 2016, the FAA restricted any commercial drone use without gaining express authorization through an exemption process.⁷⁹ The exemption process was enacted in 2012 when Congress passed the FAA Modernization and Reform Act to enable the FAA’s overall regulation of drones.⁸⁰ The next notable rules enacted to regulate commercial drone use were passed in 2016 by the FAA which resulted in commercial users not having to individually petition for an exemption to operate.⁸¹ Since

scrutinize state and local regulation of overflight,’ but regulating overflight and placing restrictions on the airspace will be necessary to regulate drone trespass effectively.” *Id.* at 1170.

⁷⁵ See *id.* at 1170 (listing specific restrictions that the FAA has said are state regulations regarding drone operation that should be avoided).

⁷⁶ See *id.* at 1172 (discussing state’s reactions to the FAA’s authority over state regulatory law).

The FAA has already said it could preempt these types of restrictions because they intrude on its exclusive jurisdiction. Therefore, even though the FAA claims that states can regulate trespass issues, it is likely that they will not be able to do so effectively, resulting in a gap in necessary drone regulations.

Id.

⁷⁷ See *id.* (setting forth how the FAA has exclusive jurisdiction to preempt any type of state drone regulations).

⁷⁸ See Page, *supra* note 20, at 1156 (reiterating the ambiguity and lack of jurisdictional precedent in drone regulation).

⁷⁹ See *id.* (discussing the original regulations by the FAA).

⁸⁰ See *id.* at 1157 (highlighting the first process of allowing commercial drone use).

⁸¹ See Page, *supra* note 20, at 1157 (summarizing the rules passed by the FAA on August 29, 2016).

2016, there were no distinguished changes made to drone regulation by the FAA.⁸²

A. *The 2018 FAA Reauthorization Act*

On October 5th, 2018 President Trump signed the FAA Reauthorization Act of 2018 (“Reauthorization Act”), providing funding for the next five years and repealing Section 336.⁸³ Section 336 was generally used to challenge any drone users attempting to register their drones.⁸⁴ Essentially, the repeal of Section 336 proposes the FAA has the authoritative power to regulate model aircrafts, which includes recreational drones.⁸⁵ Accordingly, the Reauthorization Act will bring about many changes in the drone industry as a whole.⁸⁶ Other significant provisions included within the Reauthorization Act include an update of the FAA Comprehensive plan, unmanned aircraft test ranges, carriage of property by small unmanned aircraft systems

⁸² See *id.* at 1157–60 (detailing the effects the 2016 rules had on commercial drone use).

⁸³ See Haye Kesteloo, *H.R. 302, the FAA Reauthorization Act of 2018 passed by Senate today*, DRONEDJ (Oct. 3, 2018), archived at <https://perma.cc/YMH6-AHTE> (relaying information surrounding the FAA Reauthorization Act of 2018).

⁸⁴ See Miriam McNabb, *FAA Reauthorization Explained: Part 1, the Repeal of 336*, DRONE LIFE (Sept. 25, 2018), archived at <https://perma.cc/LB8A-BENN> (outlining the implications the FAA Reauthorization Act will have on drone registration, regulation and usage overall). The article outlines the largest areas of drone use that will be affected by what is proposed in the FAA Reauthorization Act and the implications the Act will have on the future of drone technology. *Id.*

⁸⁵ See *id.* (indicating the meaning behind the repeal of Section 336 in the Reauthorization Act and what that means for the regulation of drones).

⁸⁶ See Kesteloo, *supra* note 83 (discussing the expected changes to occur from the act being passed).

Going forward all drone pilots will be required to register their aircraft and take an aeronautical knowledge test. The act also includes new provisions for tracking and ID, privacy reporting, and enforcement. Also included is the “Preventing Emerging Threats Act”, as well as Unmanned Traffic Management (UTM) and drone integration into the National Airspace System (NAS).

Id. See also Lucia Bragg, *2018 FAA Reauthorization Act and Disaster Recovery Reform Act Becomes Law*, NAT’L CONF. OF ST. LEGISLATURES (Oct. 9, 2018), archived at <https://perma.cc/7YMN-8PD2> (outlining the framework of the Reauthorization Act of 2018 and how the proposed provisions will affect drone operations). See also James Poss, *The “Why’s” of the 2018 FAA Reauthorization Act*, INSIDE UNMANNED SYSTEMS (Jan. 7, 2019), archived at <https://perma.cc/AG6S-HBXP> (commenting on the major provisions of the Reauthorization Act and detailing how they might affect the operation of drones).

for compensation or hire, an exception for limited recreational operations of unmanned aircraft, and an assessment of aircraft registration for small unmanned aircraft.⁸⁷ Some limitations listed in the Reauthorization Act reference specific altitudes the unmanned aircraft could fly at, how they must always be operated within a line of sight, and details regarding the registration and marking of drones.⁸⁸ Part IV of this Note discusses generally the changes brought about by the Reauthorization Act.⁸⁹

The Reauthorization Act, while brand new, has already been met with an array of criticisms and praise.⁹⁰ There are several proposed improvements the Reauthorization Act is said to make for integrating unmanned aircraft systems into the commercial sphere.⁹¹ A few suggested improvements recommend the bill “[a]dvance low-altitude UAS traffic management systems and services, foster

⁸⁷ See Poss, *supra* note 86 (outlining specific noteworthy sections listed in the FAA Reauthorization Act of 2018).

⁸⁸ See Tom Nardi, *Will Drones and Planes Be Treated As Equals by FAA?*, HACKADAY (Oct. 8, 2018), *archived at* <https://perma.cc/9CE6-6GVT> (briefing the different restrictions that are included within the Reauthorization Act of 2018).

⁸⁹ See *infra* Part IV.

⁹⁰ See Nardi, *supra* note 88 (stipulating how the Reauthorization Act could have a negative impact on hobbyists use of drones and others alike). “With both the industry and the FAA both pushing lawmakers to revamp the rules governing small remote-controlled aircraft, things aren’t looking good for the hobbyists who operate them.” *Id.* See also Poss, *supra* note 86 (giving an overview of specific provisions of the Reauthorization act and opinions on how it will affect drone usage and advancement going forward). See also Pia Bergqvist, *Model Aircraft Group Condemns FAA Reauthorization Bill*, FLYINGMAG (Sept. 25, 2018), *archived at* <https://perma.cc/4UAH-3ZYA> (detailing the opinion the Academy of Model Aeronautics has on the latest provisions of the FAA Reauthorization Act of 2018). A few of the implications of the Act that the Academy of Model Aeronautics are not in agreement over are that model aircraft operations would be limited to 400 feet above ground level, heavier unmanned aircrafts would be restricted to certain flying locations and that repealing of Section 336 only applies to aircrafts that weigh 55 pounds or less so there would be no effect on a larger amount of other drone registrations. *Id.*

⁹¹ See Ashley Coker, *Congress drones on: FAA Reauthorization Act paves way for unmanned aircraft integration*, FREIGHT WAVES (Oct. 4, 2018), *archived at* <https://perma.cc/LY2P-HSZM> (providing a synopsis of how the Reauthorization Act could change FAA drone regulations). For example, the Reauthorization Act allows the FAA to create regulations for UAS deliveries which could “pave the way for drone delivery of consumer goods to become commonplace as technology continues to evolve and customer expectations continue to grow.” *Id.*

development of sense-and-avoid other technologies at UAS test ranges, and provide greater flexibility to FAA to approve advanced UAS operations.”⁹² Ultimately, the outlook of the Reauthorization Act appears to reinforce the authorization and control the FAA will have in regulating drone integration into the National Airspace System.⁹³

B. Commercial Drone Usage

Despite the nebulous governmental policy, the global drone industry is rapidly growing and has become an integral part of commercial business functions.⁹⁴ “From quick deliveries at rush hour to scanning an unreachable military base, drones are proving to be extremely beneficial in places where man cannot reach or is unable to perform in a timely and efficient manner.”⁹⁵ Due to their seemingly endless commercial uses, the market for commercial drones is estimated to grow at an annual growth rate of 19% between 2015 and 2020, versus growth on the military side increasing only 5% in that same time.⁹⁶ Coincidentally, the number of industries and businesses that want to get their hands on this drone technology for their own commercial use also continues to grow day by day.⁹⁷ Drones have the

⁹² See *id.* (listing ways the FAA Reauthorization Act could improve UAS technology in the United States).

⁹³ See *id.* (providing opinions from specific entities on how the Reauthorization Act will have a positive influence on drone integration and regulation).

⁹⁴ See Divya Joshi, *Exploring the latest drone technology for commercial, industrial and military drone uses*, BUSINESS INSIDER (July 13, 2017), archived at <https://perma.cc/7WNE-LS2K> (providing how drones have become regularly integrated in regular business activities); see also *THE DRONES REPORT: Market forecasts, regulatory barriers, top vendors, and leading commercial applications*, BUSINESS INSIDER (Apr. 28, 2016), archived at <https://perma.cc/NYL8-4V3U> (proscribing how the drone industry has been gaining steady momentum despite there not being a clear indication of what governmental policy there is for regulating the use).

⁹⁵ See Joshi, *supra* note 94 (summarizing examples of how drones are able to change the commercial industry and have already started doing so in specific industries).

⁹⁶ See Joshi, *supra* note 94 (proffering how the commercial drone market is predicted to more than double the military drone market). There are newer applications for drones now that aren’t restricted to military use and because of the newfound uses, the global commercial drone market is predicted to dramatically increase. *Id.* “Adoption of drone technology across industries leapt from the fad stage to the mega-trend stage fairly quickly as more and more businesses started to realize its potential, scope, and scale of global reach.” *Id.*

⁹⁷ See *id.* (describing how drones have become central figures to business operations and governmental organizations alike).

capacity to reach inaccessible areas without expending a great deal of manpower due to being controlled remotely, therefore industries can put in minimal amounts of effort, time, and money while gaining maximum returns they were previously not capable of.⁹⁸

Industries whose efficiency and success rates that are held back by certain functional complications have improved and even resolved in some instances using drone technology.⁹⁹ The uses that drone technology offer to countless industries is decreasing workload and production costs, resolving security issues, and improving accuracy.¹⁰⁰ Businesses have taken full advantage of this technology already to increase how their day to day operations function.¹⁰¹ The most talked about use for drone technology in businesses as of late has been the ability of drones to deliver goods, akin to what Jeff Bezos plans for Amazon Prime Air.¹⁰²

The influx of drone technology use lies not only with businesses, but has extended into, and caused a larger impact on, the agricultural and public safety industries.¹⁰³ Farming and agriculture

⁹⁸ See *id.* (detailing the driving forces behind industries like Military, Commercial, Personal, and Future Technology to adopt drone technology and lessen the amount of manpower needed to fuel those sectors).

⁹⁹ See *id.* (illustrating how drones have allowed industries to break through certain barriers that were previously prohibiting them from advancing). “They are still in the infancy stage in terms of mass adoption and usage, but drones have already broken through rigid traditional barriers in industries which otherwise seemed impenetrable by similar technological innovations.” *Id.*

¹⁰⁰ See *id.* (reiterating some positive influences drone technology has had on business operations).

¹⁰¹ See David Trounce, *Drones at Work: How Unmanned Aviation Is Helping Business*, BUSINESS.COM (Feb. 28, 2018), archived at <https://perma.cc/699Q-KVPV> (detailing examples of businesses, like Amazon and Facebook who are taking advantage of drone technology for their business use). Facebook has plans to use drones to deliver wireless internet connectivity to remote areas that are not able to access it and Amazon is planning to use drone technology to start delivering packages and goods. *Id.*

¹⁰² See Howell, *supra* note 10 (discussing the delivery service, Amazon Prime Air that is in the works currently for Amazon consumers).

¹⁰³ See Trevir Nath, *How Drones Are Changing the Business World*, INVESTOPEDIA (June 25, 2019), archived at <https://perma.cc/L9K3-RWT8> (recognizing the economic impact drones will likely have on industries other than business and commerce). “Due to the ability to cover large areas, drone use in agriculture is anticipated to effectively feed and hydrate plants while also limiting exposure to diseases.” *Id.*

can use drone technology in operations that may help farmers identify failing crops early, take inventory of crops, and also map and study farmland and irrigation systems.¹⁰⁴ Comparable to the agricultural and farming industry, architecture and construction have integrated drone technology into their everyday activities by using drones to capture images and footage of properties they would like to build upon and render 3D images of their proposed structures for potential and current clients.¹⁰⁵ Similarly, photography and filmmaking, education, marketing and media, environmental monitoring, and conservation and emergency services, along with countless other industries have all explored the use of drone technology for their industry's operations.¹⁰⁶

C. Emergency Service

Although it is intriguing to think about how drone technology may change society's day-to-day activities; looking at the larger scale, drones may be most impactful on the general well-being of society.¹⁰⁷ The capabilities that drone technology have may prove to be exceedingly valuable assets for situations involving public safety, medical aid, or emergency response services.¹⁰⁸ Safety matters in

¹⁰⁴ See Adam C. Uzialko, *10 Cool Commercial Drone Uses Coming to a Sky Near You*, BUSINESS NEWS DAILY (May 10, 2018), archived at <https://perma.cc/85FE-AERL> (offering examples of drone technology application for farming and agriculture). See also Trounce, *supra* note 101 (detailing other uses for drone technology in farming and agricultural research). Research students who study agricultural fields in regard to productivity of crops can use drone technology to conduct aerial surveys, use for crop fertilization, sewing, and pest and disease reduction over hiring expensive agriculture consultants. *Id.*

¹⁰⁵ See Uzialko, *supra* note 104 (introducing an example of drone technology implementation into the architecture and construction industries).

¹⁰⁶ See *id.* (listing and discussing different industry applications that drone technology has); see also Trounce, *supra* note 101 (offering more examples and details of different industries looking to use drone technologies).

¹⁰⁷ See Uzialko, *supra* note 104 (describing how drones could be used for emergency response services); see also Vladimir Zivanovic, *6 Ways People are Using Drones to Improve Lives*, LIFE HACK (Nov. 28, 2018), archived at <https://perma.cc/8M2J-5VWS> (noting ways in which drone technology can improve lives in ways that could be life-saving).

¹⁰⁸ See Zivanovic, *supra* note 107 (reviewing examples of way drones could potentially save lives); see also Uzialko, *supra* note 104 (describing situations when drone technology can provide new opportunities for life-saving measures). "Using drones to get eyes on a difficult situation, or to deliver medical supplies to stranded victims, could enhance the ability of emergency response physicians to offer care in difficult situations." *Id.*

which drone technology can assist in are areas such as weather monitoring, search and rescue missions, disaster relief, and wildlife preservation.¹⁰⁹ Drones can be controlled remotely to reach isolated or dangerous areas, while keeping other humans out of harm's way.¹¹⁰

Drones offer the capability to complete typically dangerous, expensive or time-consuming jobs in a manner that can prove to be safer, cheaper and faster.¹¹¹ Search and rescue missions done by drones, for example, offer a dynamic way to search a larger area of ground.¹¹² Drones can “quickly locate missing persons (covering a 1km² area within 20 minutes), provide a valuable aerial perspective, which facilitates safe operations for both crews and members of the public, and can be used in the detection of “hot spots” through thermal imaging cameras.”¹¹³ Suitably, search and rescue may be the most effective use of lifesaving drones, but it is not the only invaluable use for this technology.¹¹⁴ Drones have already been used in a variety of lifesaving operations including missing persons, navigating small and large fires, assisting people involved in possible suicides, controlling crowd safety, bomb threats, fuel and/or chemical spillages, fishing vessels adrift, animal rescue, and light aircraft crashes.¹¹⁵

¹⁰⁹ See Zivanovic, *supra* note 107 (setting forth details of how drone technology can be used in life-saving scenarios).

¹¹⁰ See Joshi, *supra* note 94 (qualifying a drone's unique ability to easily reach areas humans cannot).

¹¹¹ See Zivanovic, *supra* note 107 (describing ways in which drones can be more efficient in certain emergency situations like search and rescue missions).

¹¹² See Zivanovic, *supra* note 107 (detailing how drones can improve search and rescue operations). In Canada there was an instance of a person who had been involved in a car crash and wandered away from the scene while disoriented and confused, and with the use of heat sensors that had been equipped to a drone the person was found in a timely manner and able to be saved. *Id.*

¹¹³ See Anna Jackman, *Drones For Emergency Services: Use and Value*, SKYTANGO (Nov. 5, 2017), archived at <https://perma.cc/3CB9-8KG5> (indicating how emergency services can safely deploy drone technology in situations such as search and rescue missions).

¹¹⁴ See *id.* (concluding that lifesaving drones will likely be the most effective for search and rescue operations).

¹¹⁵ See *id.* (outlining other areas in which drones could be lifesaving devices).

D. Drawbacks and Concerns

With all the appeal advancing drone technology brings, natural drawbacks accompany the advancements.¹¹⁶ The ubiquitous concerns expressed by society center around the legislation or lack thereof for increased drone use and consequent safety and privacy concerns.¹¹⁷ Society is seeking to be protected from aerial trespassing and infringement upon Fourth Amendment rights to privacy.¹¹⁸ “Drones can collect data and images without drawing attention, leading many Americans to fear their Fourth Amendment rights of privacy may be in jeopardy if government entities were to use drones to monitor the public.”¹¹⁹ What are thought to be the greatest strengths in drones—their ability to be controlled remotely and their small sizes—are exactly the attributes that allow them to impede on a person’s privacy rights.¹²⁰

The onslaught of concerns led to strict regulations seemingly haphazardly thrown together and floundering amongst legislatures to determine who decides how drones must be operated.¹²¹

¹¹⁶ See Labrien, *supra* note 15 (discussing negative implications of increased commercial drone usage).

¹¹⁷ See *The Pros and Cons of Unmanned Aerial Vehicles (UAVs)*, OHIO UNIVERSITY (Jan. 16, 2019) [hereinafter *The Pros and Cons of UAVs*], archived at <https://perma.cc/459C-8VV9> (giving a general overview of major pros and cons to UAV usage); see also Anthea Mitchell, *Should America Be Worried About Police Drones?*, THE CHEAT SHEET (Sept. 13, 2018), archived at <https://perma.cc/AS7A-6NMC> (discussing generally the implications and impact drones could have on society and specifically regarding police drones). “The need to regulate and limit police and federal power, and the need to make safety considerations for equipment use have become hot topics surrounding UAV technology.” *Id.*

¹¹⁸ See *The Pros and Cons of UAVs*, *supra* note 117 (outlining concerns society has in the uncertainty in legislation and protection of privacy rights).

¹¹⁹ See *id.* (generalizing how drones have the potential to impede on society’s right to privacy).

¹²⁰ See Dan Gmelin, *Benefits And Risks of Using Drones: What Businesses Should Know*, ARGO GROUP (Jan. 16, 2019), archived at <https://perma.cc/7S4V-CBWC> (reiterating top concerns of drone usage including the new hazards and exposures that may exist); see also *The future of drones depends on regulation, not just technology*, THE ECONOMIST (June 10, 2017), archived at <https://perma.cc/WQT6-ZBFA> (contending how drone technology will advance only if engineers and regulators are able to work together to maximize the usage of commercial drones).

¹²¹ See Gmelin, *supra* note 120 (explaining how the insurance industry and legislation have addressed some of the concerns). “Flight regulations have been established, including prohibiting drones from flying higher than 400 feet. They must remain at least five miles away from airports.” *Id.*

Unfortunately, the creation of regulations and restrictions that properly limits the usage of drones proved problematic and inconclusive.¹²² An incident recently occurred at the UK's Gatwick airport on December 20, 2018, when the airport was forced to close for almost an entire day because there were reports of at least fifty drones flying over and near the airport's runways.¹²³ The Gatwick occurrence led to backlash and questions over whether current regulations are effective or if harsher restrictions should be enacted.¹²⁴ Questions remain over what regulations should be in place for drone users and precisely how restrictive they should be.¹²⁵

IV. Analysis

The regulation and restriction of commercial drone usage by the FAA are a hindrance to the technological advancement and efficient use of drones in the commercial realms.¹²⁶ The decision to monitor drone usage is sensible, but the actions taken to do so have

¹²² See David Cardinal, *Drone Safety After Gatwick: More Regulations May Not Work*, EXTREME TECH (Dec. 21, 2018), archived at <https://perma.cc/F4DS-AA6Q> (discussing how some of the FAA drone regulations have not been effective at controlling drone operations).

¹²³ See *id.* (describing the incident that occurred at Gatwick airport in which it was forced to close due to drone usage).

¹²⁴ See *id.* (contending the regulations in place right now for drone users were not effective in preventing the issue that happened at the Gatwick airport). "However, as with regulating in general, simply making up rules doesn't necessarily solve the problems." *Id.*

¹²⁵ See Ryan Hilton & James Shaw, Jr., *The Federal Aviation Authority Reauthorization Act of 2018 and Its Effect on Drones*, JDSUPRA (Jan. 15, 2019), archived at <https://perma.cc/3HQJ-2R2H> (analyzing the most recent FAA drone regulations set into place on October 5, 2018); see also Ryan Whitwam, *FAA Considering Loosening Drone Regulations*, EXTREME TECH (Jan. 15, 2019), archived at <https://perma.cc/4G5V-3N2W> (reiterating the FAA's struggles and apprehension over the current drone use restrictions and proposing a new set of rules).

¹²⁶ See *The future of drones depends on regulation, not just technology*, *supra* note 120 (contending how the future of drone technology is promising but will depend on the regulations that are set in place for their operation). "Drones make the extraordinary power of digital technologies physically incarnate. But because they operate in the physical rather than the virtual world, exploiting the many opportunities they offer will depend just as much on sensible regulation as on technological progress." *Id.*

been, in part, chaotic.¹²⁷ With no unanimous conclusions as to who should govern airspace property rights, the current regulations tend to be either futile and stringent or facile and ineffective.¹²⁸ If society wants to maximize economic and social welfare potential, drone regulation needs to focus less on the protection of privacy interests and more on capitalizing the pragmatic uses of drones.¹²⁹

A. *Successful Drone Regulations*

The importance of drone regulation in our modern day need not be dismissed, and there are areas in which legislators and the FAA have been astute in regulating commercial drone use.¹³⁰ With the advancement of technology into modern day lives, there will always be implications and disadvantages that accompany it.¹³¹ The

¹²⁷ See Urban, *supra* note 9, at 5 (outlining the lack of precedent on deciding who owns airspace). Regarding the case *United States v. Causby*, which was decided in 1946, “[a]lthough this case is relatively on point, it is outdated. It is unlikely the justices in 1946 could have imagined the holding’s implications on drones decades later.” *Id.* “The United States’ airspace is the busiest in the entire world; yet, the government has not provided adequate solutions on how to handle drones and its operations within US airspace.” *Id.* at 7. See also Anderson, *supra* note 1, at 61 (citing different regulations the FAA set forth that were not viewed as being effective nor strict). Speaking of the Advisory Circular the FAA issued in 1981, “[n]otably, these were voluntary requests rather than formal rules. For years, these voluntary guidelines remained the FAA’s only stance governing the use of small unmanned aircraft, until the early stages of private drone use in 2005.” *Id.*

¹²⁸ See Sneed, *supra* note 29 (reiterating some of the confusion regarding whether the FAA is in charge of drone regulation or if it is state and local governments that should be deciding). The article points to different regulations some state and towns have already passed in regard to drone regulation, such as the city of Saint Bonifacius in Minnesota and California. *Id.* Sneed also goes on to imply that if the FAA were to block some of the restrictions that were established by local state or town authorities, there “would probably [be] push back, especially because state law—not federal—determines property rights.” *Id.*

¹²⁹ See *The future of drones depends on regulation, not just technology*, *supra* note 120 (condemning current air-safety rules that are being enforced for not being logical).

¹³⁰ See Urban, *supra* note 9, at 4 (explaining different problems new drone technology creates including violating air space, cybersecurity, and privacy issues).

¹³¹ See Urban, *supra* note 9, at 4 (detailing the different concerns brought about by drone technology).

This paper will argue that it is imperative for regulations on UAVs to address cybersecurity and privacy issues in order to remain on the forefront of technology within the aviation industry. Although it may seem like it is more

expansion of commercial drones and discovery of innovative uses for them within different economic and social-welfare facets have been unprecedented.¹³² However, the safety of people, protection of privacy and clear legislation have all been put in question from this progression of drone technology and the integration they have had into our daily social and business affairs.¹³³

The FAA and local government legislators have not been turning a blind eye to the negative repercussions increased drone use might elicit.¹³⁴ Part 107 of the FAA rules for small unmanned aircraft

important to establish basic laws on UAS usage, legislators need to work proactively, rather than retroactively, to prevent detrimental cybersecurity and invasions of privacy from occurring.

Id. at 5. See also Anderson, *supra* note 1, at 48 (citing to different considerations the FAA and state legislatures need to consider when drafting rules and statutes for drone regulation). “Advancing technology has created many modern threats to corporate security, including computer viruses capable of stealing private user data, and highly sophisticated means for carrying out proprietary information theft.” *Id.*

¹³² See Anderson, *supra* note 1, at 53 (outlining how corporations have begun to experiment with the rapidly advancing drone technology to improve their operations). An example discussed in the text is how real estate agent are able to show “prospective homebuyers aerial views of neighborhoods and videoing the routes that the homebuyers’ children could walk to school or parks.” *Id.* “Google also recently began experimenting with using drones to provide wireless Internet service in remote parts of the world.” *Id.* See also Zivanovic, *supra* note 107 (citing the numerous ways drone technologies are improving lives). The article outlines different positive impacts UAVs have already had on the world, including weather monitoring, search-and-rescue missions, wildlife preservation, home maintenance, agriculture, and delivery and marketing. *Id.*

¹³³ See *The Pros and Cons of UAVs*, *supra* note 117 (stressing examples of how drone technology made society fear for their safety and privacy). See also Page, *supra* note 20, at 1164 (reaffirming conflicts that have arisen from drone usage, including those that involve property owners and trespass of property).

Conflicts that have already arisen between drones and property owners include drones flying over sporting events, through fireworks displays, and over private property. Additionally, there have been multiple conflicts, like the one between Boggs and Merideth, in which a property owner has tried to shoot a drone out of the sky.

Id.

¹³⁴ See Page, *supra* note 20, at 1156–59 (giving a brief overview of the history of drone regulations). See also Urban, *supra* note 9, at 7 (illustrating how in 2012, Congress enacted a rule requiring the FAA to establish UAS regulations).

operations, other than model aircrafts, include various rules for the betterment of drone usage overall and protection of people.¹³⁵ In fact, “[t]he FAA’s part 107 rules, providing for certification of commercial drone operators, are generally seen as a model by other countries.”¹³⁶ Some rules listed in Part 107 that improved drone operations were the operating requirements, including avoiding other manned aircrafts and not operating in a careless or reckless manner.¹³⁷ Also, those flying drones under part 107 must register their drone and obtain a remote pilot certificate with a small UAS rating.¹³⁸ The remote pilot certificate must be obtained in one of two ways:

- (1) You may pass an initial aeronautical knowledge test at an FAA-approved knowledge testing center.
- (2) If you already have a Part 61 pilot certificate, you must have completed a flight review in the previous 24 months and you must take a small UAS online training course provided by the FAA.¹³⁹

¹³⁵ See Williams, *supra* note 41 (detailing how Part 107 gave regulatory framework for regulating drone operations). “Soon after, Part 107 – Small Unmanned Aircraft Systems, established the regulatory framework for certifying remote pilots and regulating their flight operations. Commercial UAS operators also now had a legal foundation to conduct their new line of work, and when in compliance of Part 107, free from FAA prosecution.” *Id.* See also *The future of drones depends on regulation, not just technology*, *supra* note 120 (describing different effects Part 107 has had on overall drone operation).

These rules, a decade in the making, allow operators with a remote-pilot certificate (obtained by passing a test costing \$150) to fly a drone for commercial purposes during the day, within line of sight, in uncontrolled airspace, and without flying over people who are not involved in operating the drone. Other countries have since followed America’s lead, and some are already going further: France and Switzerland allow some operation beyond visual line of sight, says Mr McNeal, and from 2018 Japan will permit it for delivery drones.

Id.

¹³⁶ See also *The future of drones depends on regulation, not just technology*, *supra* note 120 (comparing how Part 107 has incited other countries to follow the United States’ lead in regulations of drone and other devices).

¹³⁷ See Dorr, *supra* note 41 (articulating the different rules listed in Part 107 of the FAA regulation for small unmanned aircraft operations).

¹³⁸ See Dorr, *supra* note 41 (describing the process of registration and application for a pilot certification those wanting to fly drones under Part 107 must comply to).

¹³⁹ See *id.* (explaining in detail the two ways one may obtain a pilot certification under Part 107). See also Williams, *supra* note 41 (describing in further detail some

Part 107 also outlines that an operating drone must be available to the FAA for inspection or testing upon request and provide any important or associated records.¹⁴⁰ Lastly, one of the more astute rules that Part 107 enacted was that the FAA can issue waivers for certain requirements, provided that operators can show drone use is conducted safely and meet some additional safety requirements.¹⁴¹ Allowance of waivers offers the ability to test new regulations and restrictions on drone use before they are actually formalized, which will open up more doors to drone operations.¹⁴²

of the rules listed in Part 107, including the requirement of obtaining a remote pilot license). “Pilots interested in becoming certified remote pilots will find the study materials and the exam rather easy; the regulations in Part 107 mostly mimic, and are often more simplistic than those in Part 43 (airworthiness/maintenance), Part 61 (pilot certification), and Part 91 (general operating rules).” *Id.*

¹⁴⁰ See also Williams, *supra* note 41 (deferring to the other requirements set forth by Part 107). By mandating inspections and pilot licenses, it is evident that the FAA was looking to help ensure that drones were operated in a safe manner. *Id.*

The FAA then worked with drone manufactures to provide the consumers with an informational packet that would be included with the sale of each new model, as well as a website that had the correct and most up to date information. With the new informational packets and media coverage of substantial fines for errant drone operators, the number of near collisions with aircraft subsided.

Id.

¹⁴¹ See Dorr, *supra* note 41 (acknowledging the other waivers and airspace authorizations Part 107 enacted into the rules). See also *The future of drones depends on regulation, not just technology*, *supra* note 120 (highlighting an example of an additional requirement one may have to meet to be allowed a special waiver from the FAA).

¹⁴² See *The future of drones depends on regulation, not just technology*, *supra* note 120 (stipulating a way in which the allowance of waivers will likely have a positive impact on future drone regulations). The article illustrates that the allowance of waivers will be beneficial to the future of drone regulation because when there are operators who want to fly their drone in a manner that isn't specifically allowed by Part 107 of the rules, they may approach the FAA and ask for special allowance. *Id.* In turn, approaching the FAA allows these special exceptions to be observed to see if a rule prohibiting the activity is truly necessary. *Id.* “Drone companies can already go beyond part 107 by obtaining special waivers from the FAA, provided they can show that the proposed operation can be conducted safely and meet some additional requirements. This offers a way to test new regulations before they are [formalized].” *Id.*

The Reauthorization Act of 2018 also included several “pro-innovation aviation reforms” which improved drone usage conditions.¹⁴³ Specifically, the Reauthorization Act directed the FAA to adopt more of a risk-based approach rather than an approach centered around deterrence and complete avoidance of certain drone uses.¹⁴⁴ “Striking the right balance between the FAA’s safety mission and a permissionless innovation approach to drone policy is challenging, but the FAA Reauthorization is a good first step.”¹⁴⁵ Other positive rules established in the Reauthorization Act were provisions that “may expedite the FAA’s review and lifting of drone restrictions,” allowing more capable operators to fly their drones in different conditions.¹⁴⁶

One of the bigger issues the Reauthorization Act addresses is the focus on safety of the people.¹⁴⁷ Section 364, for example, focuses on Counter-UAS (“C-UAS”) System Review of Interagency Coordination Processes.¹⁴⁸ The purpose of this provision is to report

¹⁴³ See O’Sullivan, *supra* note 41 (outlining one of the better changes that has been brought on by the Reauthorization Act).

¹⁴⁴ See *id.* (describing how the former approach was not a risk-based approach to drone policy). O’Sullivan goes on to describe the former approach as “largely knee-jerk and unscientific” meaning the FAA’s culture was akin to being zero-tolerance and overly strict. *Id.*

¹⁴⁵ See O’Sullivan, *supra* note 41 (maintaining that the sway from being zero-tolerance to risk-based is an overall positive one for the FAA). For example, “[T]he NAS report takes issue with the FAA’s process of issuing waivers that are required in order to operate drones in ways restricted by FAA rules.” *Id.*

¹⁴⁶ See *id.* (outlining how the Reauthorization Act begins to sway the FAA from being too conservative in their allowance of waivers of restrictions). “Before granting a waiver, the FAA asked operators to show they were prepared to handle any hypothetical dangerous scenario, putting applicants in the awkward position of having to show definitively that experimental technologies could not fail.” *Id.*

¹⁴⁷ See *id.* (elucidating how the Reauthorization Act takes a first step towards helping to protect from rogue drones).

In a welcome move, FAA Reauthorization takes the first step toward granting federal, state, and local aviation authorities and law enforcement officials the authority they currently lack to counter drones that may threaten large events, national monuments, or critical infrastructure. Congress also asks the FAA to come up with a plan to improve coordination among the federal authorities that create drone rules and the state and local law enforcement officials who are in better position to catch violators.

Id.

¹⁴⁸ See Poss, *supra* note 86 (giving an overview of Section 364 of the Reauthorization Act including the issues, winners and losers of the provision).

on what standards will be implemented to protect from rogue drones threatening people and/or their property.¹⁴⁹ Another similar provision is Section 366, which deals with a Strategy for Responding to Public Safety Threats and Enforcement Utility of Unmanned Aircraft Systems.¹⁵⁰ This provision states that the FAA has one year from when the Reauthorization Act was implemented to develop a plan that will guide state and local authorities regarding how they should respond to any public safety threats posed by drones.¹⁵¹ Section 366 also stipulates the FAA provide guidance to state and local authorities regarding the utilization of drones to enhance the effectiveness of first responders.¹⁵² Section 366 essentially bridges the gap between the FAA and local and state authorities by instituting the use of drones to aid in the authorities' duties, specifically regarding the protection of the areas within their jurisdiction from any threatening behaviors.¹⁵³

B. Where the FAA Regulations Still Fall Short

The implementation of the Reauthorization Act of 2018, while successful in some areas, left many grey areas regarding the use and

¹⁴⁹ See *id.* (describing how Congress is becoming more serious about acknowledging C-UAS systems and the threats they pose to society). C-UAS, or rogue drones, pose a real threat to the country and unless there are established guidelines as to how to avoid their interference, they could cause serious harm. *Id.*

¹⁵⁰ See *id.* (stating another provision that focuses on increased safety and the overall social-welfare of society).

¹⁵¹ See *id.* (providing insights as to what this provision is actually saying and how it will actually positively impact society).

¹⁵² See *id.* (commenting on another positive impact Section 366 of the Reauthorization Act will have for drone users and the public). By enforcing the FAA to propose guidelines to local and state authorities the many uses drones have for protection of the public and aid to first responders is a large step to seeing them used more often in situations that will be able to save lives. *Id.*

¹⁵³ See Bragg, *supra* note 86 (highlighting what Section 366 will require of the FAA to implement a comprehensive strategy for the state and local governments). The purpose of Section 366 and the FAA's strategic, comprehensive plan is to "provide guidance for local law enforcement agencies and first responders with respect to how to identify and respond to public safety, threats posed by UAS and how to identify and take advantage of opportunities to use UAS to enhance the effectiveness of local law enforcement agencies and first responders." *Id.* See also Poss, *supra* note 86 (indicating that the FAA and state and local authorities need to work together to protect against any harmful activities).

progression of drone technology.¹⁵⁴ The National Academies of Sciences (“NAS”) issued a review criticizing the FAA for being too restrictive and asserts that “the FAA’s conservative approach to drone innovation is holding back important progress that ‘could improve safety of manned aircraft operations’ and ‘spur economic growth and development through innovative applications of this emerging technology.’”¹⁵⁵ Loosening restrictions allow the endless applications for drones to be capitalized to their fullest extent with no hindrances that arise from needing to follow obstructive regulations that have no clear purpose.¹⁵⁶ Accordingly, drone users unambiguously stipulate that users should be allowed to operate their drones in various conditions, like at night or in publicly populated areas.¹⁵⁷

Several parties, specifically the FAA, believe that simply enacting the all-or-nothing rules for drone users, akin to the one preventing drones from being operated at night, is effective and practical.¹⁵⁸ Drone regulations should not be so cut and dry or black and white; they will be more effective if they were tailored to allow the drone users that are responsible and mindful to operate their drones under any conditions with no special permits or licenses.¹⁵⁹ With currently 1.3 million registered drone aircrafts in the United States, “the number of incidents reported to the FAA is small.”¹⁶⁰ One of the questionable aspects of the current regulations on drone operations is the lack of restrictions for drones “in flight.”¹⁶¹ There are many restrictions against taking off, landing, and operating drones from

¹⁵⁴ See O’Sullivan, *supra* note 41 (discussing how the Reauthorization Act still did not solve a lot of problems in regard to regulating drone use).

¹⁵⁵ See *id.* (explaining why the FAA regulations are inhibiting the advancement of drone technology).

¹⁵⁶ See Whitwam, *supra* note 125 (reiterating if restrictions were loosened commercial drones could be more useful in the US).

¹⁵⁷ See *id.* (indicating two restrictions that should be lifted). Previously, the FAA required waivers for nighttime operations. *Id.* “With 1,233 waivers granted through 2017, the FAA has not gotten any reports of nighttime accidents. The one additional requirement here is that drones operating at night need to have an ‘anti-collision’ light that is visible from three miles away.” *Id.*

¹⁵⁸ See Cardinal, *supra* note 122 (outlining the black and white rules that the FAA have implemented).

¹⁵⁹ See *id.* (justifying why simply making rules is not the best procedure for regulating drone usage).

¹⁶⁰ See Whitwam, *supra* note 125 (establishing how few incidents have been reported to the FAA over inappropriate drone use).

¹⁶¹ See Cardinal, *supra* note 122 (demonstrating how the FAA only will govern drones while in flight versus drones that are launching or landing on property).

specific properties, but there are no restrictions against flying over properties.¹⁶² To illustrate, it is illegal to launch or land a drone on any U.S. National Park property.¹⁶³ However, so long as the operator is not partaking in any unsafe activity, drones may fly over National Parks.¹⁶⁴ The regulation, in this instance, should allow drones to launch and land on this type of property simply because it is an unwarranted hassle to differentiate between landing and taking off on properties versus flying over them.¹⁶⁵ Those familiar with operations of drones will acknowledge there is typically no extra harm that may occur during the take-off or landing on a property versus during the actual flight over the property.¹⁶⁶

Another seemingly ineffective drone restriction, is that operators may not fly drones at night.¹⁶⁷ Currently, the FAA requires pilots to obtain distinct waivers to operate drones at night.¹⁶⁸ Of course, drone operations at night are more dangerous than during the day

¹⁶² See *id.* (characterizing the type of regulations that are employed by the FAA for drones in flight). “The FAA governs drones while in flight. That’s an important point, as that means in most cases property owners can restrict you from taking off, landing, or operating a drone from their land. But they can’t restrict you from flying over their land unless they have gotten the FAA involved, or you are violating some other regulation.” *Id.*

¹⁶³ See *id.* (affirming one example of how the FAA employs the launching and landing restriction).

¹⁶⁴ See *id.* (describing the regulation against drones being launched or landing on US National Parks). A contrasting regulation to the one that allows drones to fly over US National Parks is that drones are not allowed to fly near an airport due to the FAA’s airspace regulations unless the operators have obtained appropriate clearances or waivers to such restriction. *Id.*

¹⁶⁵ See Whitwam, *supra* note 125 (analyzing that the FAA should consider loosening their drone restrictions and regulations so as to allow commercial drone usage to prosper). See also Sneed, *supra* note 29 (reiterating how troublesome restrictions from flying drones over property has caused problems for drone users). “State and local laws that ban drones from flying over property also create problems for everyone else who wants to use them, like realtors who want to take aerial photos or journalists who need to cover breaking news from the air or activists capturing a protest on video.” *Id.*

¹⁶⁶ See *id.* (constituting that there have been far fewer reports of drone incidents that was previously estimated).

¹⁶⁷ See *id.* (recalling the regulation that prohibits drones from being operated at night).

¹⁶⁸ See *id.* (describing how only a certain number of drone operators are allowed to fly at night).

simply because visibility is limited, so there should be extra precautions at night with or without specific regulations.¹⁶⁹ This regulation is unnecessary because it creates one extra step to be taken by operators for simple flight routines.¹⁷⁰ “With 1,233 waivers granted through 2017, the FAA has not gotten any reports of nighttime accidents. The one additional requirement here is that drones operating at night need to have an “anti-collision” light that is visible from three miles away.”¹⁷¹ One suggestion is to make it mandatory for drones to have a visible, evening light, eradicating the need for the waiver and allowing a slew of various uses for drones to be used to the benefit of the public would become available.¹⁷² To illustrate, if drones could operate at night without having to navigate through extraneous and ambiguous protocols, allows the possibility for wildlife conservation efforts to gather more footage of endangered or near-extinct species and their nighttime behaviors or patterns.¹⁷³

Another change that the FAA would benefit from enacting is allowing licensed operators to fly drones over populated areas.¹⁷⁴ Of course, these drones would be registered and have to meet other requirements to ensure the safety of the public, but, if allowed, many doors would be opened for commercial entities to capitalize on drones and drone technology.¹⁷⁵ Amazon, for example, could employ the proposed “Prime Air” service discussed previously in this text, enabling faster and more efficient shipping services to their

¹⁶⁹ See *id.* (indicating the regulation of nighttime drone operations).

¹⁷⁰ See *id.* (establishing how nighttime accidents are not common and need not be restricted so heavily).

¹⁷¹ See *id.* (illustrating that the statistics for nighttime collisions is not high). See also *The future of drones depends on regulation, not just technology*, *supra* note 120 (indicating the process involved when the FAA allows a waiver to pilots wanting to operate their drones during the night against the restriction).

¹⁷² See Whitwam, *supra* note 125 (justifying that loosening drone regulations would make drones more useful).

¹⁷³ See Zivanovic, *supra* note 107 (highlighting an important use drone technology would have, specifically in wildlife preservation).

¹⁷⁴ See Whitwam, *supra* note 125 (indicating the caveats and potential importance of the FAA allowing drones to fly over certain populated areas).

¹⁷⁵ See *The future of drones depends on regulation, not just technology*, *supra* note 120 (reiterating the different procedures that must be put in place for drones to be allowed to fly over densely populated areas). “To operate drones beyond visual line of sight and in large numbers, particularly in densely populated areas, will take not just extra rules but the establishment of new traffic-management systems, akin to air-traffic-control systems, to prevent drones crashing into each other or veering off course.” *Id.*

customers.¹⁷⁶ “Drones make the extraordinary power of digital technologies physically incarnate. But because they operate in the physical rather than the virtual world, exploiting the many opportunities they offer will depend just as much on sensible regulation as on technological progress.”¹⁷⁷

V. Conclusion

It is important to protect fundamental rights, including but not limited to, a person's right to privacy, but the current path that drone regulation is travelling down will hinder constructive advancements in drone technology. The lack of communication between the FAA and state and local officials regarding drone regulation has led to ambiguity and confusion amongst society. The current regulations and questions over what entity has the authority to oversee them have too many discrepancies to be contributing to the protection of people's fundamental rights in an efficient and resourceful manner.

Drone technology is advancing rapidly and enabling more commercial uses amongst many types of business functions. However, the guidelines and regulations set in place for commercial drone use provide superfluous boundaries doing little to justly protect the interests of society. With explicit guidelines, businesses looking to use drones for industrious reasons will have fewer burdens. Ultimately, to advance drone use in commercial and emergency settings, the officials in charge of regulating overall drone operations ought to properly research the advancing technology and focus less on protecting society's rights in a deterrent manner.

¹⁷⁶ See Howell, *supra* note 10 (considering a use for drones within the Amazon company).

¹⁷⁷ See *The future of drones depends on regulation, not just technology*, *supra* note 120 (justifying how many opportunities there are for commercial drones if FAA regulations and restrictions are honed and loosened).