

**UNCERTAINTY AND INNOVATION:
THE NEED FOR EFFECTIVE
REGULATIONS TO FOSTER
SUCCESSFUL INTEGRATION
OF PERSONAL AND
COMMERCIAL DRONES**

*Michael Calvo**

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* J.D., May 2016, Southwestern Law School.

I. INTRODUCTION

There are few technology platforms that match the versatility of drones. Farmers can utilize these devices to help steer water and pesticides to crops with precision, which in turn reduces expenditures and the environmental overexposure of chemicals.¹ Engineers, or even local emergency responders, can remotely examine structural problems of roads or bridges, map out pipelines and power lines, or even quickly search for and locate victims of natural disasters.² Unfortunately, the freedom to employ such devices for many of these tasks has not been granted, and individuals and businesses are waiting for key regulations to be passed that will give them some direction in how to utilize drone technology.

It was not so long ago that the word “drones” would invoke images of a top-secret unmanned military aircraft carrying out black-ops missions or some other controversial operations in the minds of ordinary citizens.³ Only in the past few years have these unmanned aircraft been able to break away from the stigma associated with their use and adapt a friendlier, non-militaristic public perception. Unmanned Aerial Vehicles, more popularly known as drones, have undoubtedly become a vital instrument on the battlefield of today’s wars.⁴ The explosion of drone technology is not only permanently changing military tactics and the landscape of war but is also currently influencing and shaping drone regulations regarding both commercial and individual applications across many countries.⁵ With advancements in drone technology, countries are scrambling to gain possession of a drone platform, either for military or non-military applications.⁶ As the number of drones increase and companies like Parrot successfully place non-military drones in the hands of everyday consumers, the issue of how to regulate this growing technology is be-

1. ASSOCIATED PRESS, *Everyday Drones Could Become Part of American Life*, SYRACUSE.COM (Mar. 30, 2013, 10:28 AM), http://www.syracuse.com/news/index.ssf/2013/03/risk_and_reward_at_the_dawn_of.html.

2. *Id.*

3. Marcelo Ballve, *Drones Will Become a Reality In Our Daily Lives*, BUS. INSIDER (Apr. 16, 2014, 2:35 PM), <http://www.businessinsider.com/drones-will-become-a-reality-in-our-daily-lives-2014-4>.

4. See Peter Bergen & Jennifer Rowland, *A Dangerous New World of Drones*, CNN (Oct. 8, 2012, 5:13 AM), <http://www.cnn.com/2012/10/01/opinion/bergen-world-of-drones/>.

5. See *id.* (providing how countries are rapidly adapting to advancing drone technologies, and recognizing issues that come from non-unified legal regulations on the international level).

6. *Id.*

coming more prevalent.⁷ Due to this rapid growth, it will not be long before private actors will operate drones in equal, if not greater, numbers than current government operations.⁸

Today, under a fragmented regulatory framework in the United States and Europe,⁹ the major concern with authorizing the use of drones in everyday life stems from a fear that a lack of oversight regarding the unregulated use of drones will lead to a devastating disaster affecting the privacy and safety of the public.¹⁰ The public fears that governmental organizations will be ill-equipped to protect their citizens from an invasion of privacy presented by the potentially high volume of drones in the air.¹¹ Therefore, drone technology requires a more unified and consistent approach than the current legislation that attempts to guide drone application, with an emphasis on safeguarding citizen's individual privacy, within the United States and the European Community, in order to foster the integration of civilian drone use for both commercial and individual purposes.

Part II of this article will help the reader develop an understanding of drone technology by discussing the developments of said technology, beginning with its inception as an instrument for military applications. This section will also examine how drone technology has evolved as drones have slowly crept into the United States' National Airspace in both a commercial and private capacity.

Part III of this article will first examine the FAA Modernization Reform Act of 2012 and its heavy-handed push for the Federal Aviation Administration to regulate drone technology. It will then examine the pitfalls of developing regulation around this technology and the major concerns individual citizens have regarding drone technology. Finally, it will look at the structure of current drone regulation and whether or not there are any safeguards in place to protect citi-

7. See Mark Corcoran, *Drone Wars: The Definition Dogfight*, AUSTL. BROAD. CORP. (Feb. 28, 2013, 5:32 PM), <http://www.abc.net.au/news/2013-03-01/drone-wars-the-definition-dogfight/4546598>.

8. WELLS C. BENNETT, BROOKINGS INST., CIVILIAN DRONES, PRIVACY, AND THE FEDERAL-STATE BALANCE 3 (2014), http://www.brookings.edu/~media/Research/Files/Reports/2014/09/civilian-drones-privacy/civilian_drones_privacy_bennett_NEW.pdf?la=en.

9. See Patrick Benedict, *Commercial Drones a Serious Safety Concern?*, ABC15 ARIZONA (June 6, 2013, 10:36 PM), <http://www.abc15.com/news/local-news/investigations/commercial-drones-a-serious-safety-concern>; Gabriel Voisin, *Drones: Privacy Implications Across the EU*, BIRD & BIRD (July 15, 2013), <http://www.twobirds.com/en/news/articles/2013/global/drones-privacy-implications-across-the-eu>.

10. Benedict, *supra* note 9.

11. Chris Schlag, *The New Privacy Battle: How the Expanding Use of Drones Continues to Erode Our Concept of Privacy and Privacy Rights*, 13 PITT. J. TECH. L. & POL'Y 12 (2013).

zens from the potential dangers stemming from the use of this technology. Although implications of general safety are a key component in the Federal Aviation Administration's task in drone regulation,¹² Part III will only explore issues of privacy that arise from this technology's use.

Part IV will then examine the current fragmentation of drone regulation in Europe and assess the reasons behind the more successful integration of drone technology in European citizens' everyday lives. It will then look at safeguards currently in place across the European community and the privacy implications that this technology brings with it.

Finally, Part V will conclude by providing an overall impression about the state of current drone regulation and the integration of this technology in civilian life, and whether we will witness it for ourselves in the near future.

II. FROM THE MILITARY TO CIVILIAN APPLICATION, WHAT MODERN DRONES ARE TODAY

A. *Drones in the Military*

To appreciate the expansion of drone technology and how future laws will need to address this innovative and advanced instrument, a historical look at the evolution of drones is necessary. With much of the technology society enjoys for personal use already having been derived from military applications,¹³ the drone is no different. Decades before anyone associated the words "predator" and "reaper" to the unmanned aircrafts of today's battlefield, and before the first manned civilian airplane flight took place in 1903,¹⁴ the most primitive versions of unmanned aircraft technology had been seen on the battlegrounds of at least two wars.¹⁵ The roles of these primitive drones at this time were used for both combat and for surveillance missions.¹⁶ As World War I raged across Europe, the United States produced the first unmanned aircraft systems, and the success of these test flights

12. *FAA Head: Safety, Privacy Concerns Abound in Regulating Drones*, NPR (May 5, 2014, 3:01 PM), <http://www.npr.org/sections/alltechconsidered/2014/05/05/309746615/faa-head-safety-privacy-concerns-abound-in-regulating-drones>.

13. Les Shu, *GPS, Drones, Microwaves and Other Everyday Technologies Born on the Battlefield*, DIGITAL TRENDS (May 26, 2014), <http://www.digitaltrends.com/cool-tech/modern-civilian-tech-made-possible-wartime-research-development/>.

14. Lexi Krock, *Spies That Fly – Time Line of UAVs*, PUB. BROAD. SERV., <http://www.pbs.org/wgbh/nova/spiesfly/uavs.html> (last visited Sept. 20, 2015).

15. *Id.*

16. *Id.*

solidified military interest in unmanned aircraft.¹⁷ Two decades later, drone technology took a sharp turn toward greater improvements made in the 1930s, in response to the devastating loss of life in close combat missions during World War I.¹⁸ The drones created during this era were initially simple “pilotless, radio controlled military target towing aircraft.”¹⁹ However, it would not be long before drones transcended their simplistic roles.

Today’s military drones have drastically improved in sophistication, and with that, their deadlines,²⁰ prompting the need for their role and definition to be changed.²¹ Technological advancement of Unmanned Aerial Vehicles (UAVs/drones) have allowed these devices to take on specific roles, either in reconnaissance, surveillance, or direct combat engagements during times of war.²² Currently, there are estimated numbers of seventeen types of drone platforms being utilized in the U.S. Military, each with different capabilities.²³ These drone platforms range from the notorious (MQ-1A/B Predator) to the stealthy (A 160T Hummingbird).²⁴

But what gives drones their technological capabilities? The answer to this question lies within a drone’s Unmanned Aircraft System (UAS).²⁵ A drone’s UAS comprises the drone’s entire system, including its aircraft, the digital network that it connects to, and the personnel on the ground, manning the drone.²⁶ Coupled with advances in navigation, communication, materials, and other technologies within the past ten to fifteen years, the growing sophistication of these systems has had a substantial impact on their performance potential.²⁷

B. Drones in Civilian Life

Today, drones are no longer solely military tools, and their use has now expanded into the civilian world.²⁸ Drones can be found in a

17. *Id.*

18. *Id.*

19. Corcoran, *supra* note 7.

20. See JEREMIAH GERTLER, CONG. RESEARCH SERV., R42136, U.S. UNMANNED AERIAL SYSTEMS 1 (2012).

21. Corcoran, *supra* note 7.

22. GERTLER, *supra* note 20, at 3.

23. *Id.* at 7-8.

24. *Id.* at 8.

25. RICHARD M. THOMPSON II, CONG. RESEARCH SERV., R42701, DRONES IN DOMESTIC SURVEILLANCE OPERATIONS: FOURTH AMENDMENT IMPLICATIONS AND LEGISLATIVE RESPONSES 1 (2013).

26. *Id.*

27. GERTLER, *supra* note 20, at 6.

28. Voisin, *supra* note 9.

number of civilian sectors such as journalism, scientific research, agriculture, and surveillance.²⁹ Because of how they are designed, their variations in size, and their almost limitless capabilities,³⁰ drone technology has virtually presented this generation with a twenty-first century new-age equivalent of the Swiss-Army Knife.

Because these aircrafts are intended to operate without a pilot, either through a platform system or a remote computer system, the functionality of these machines are endless. Even though drones were primarily developed for military purposes, technological advancements coupled with an availability of economically priced-parts have allowed drones to make their way into civilian life.³¹

The seemingly limitless potential for this technology has captured the interest of several large companies; two of the most notable are Amazon and Google.³² In December 2013, Amazon announced “Prime Air,” which is currently a developmental airborne delivery system designed to deliver orders to customers who live within a ten mile radius of an Amazon warehouse.³³ Not wanting to be outdone by the electronic commerce giant, on August 28, 2014, Google also unveiled its delivery drone project, “Project Wing,” which is a part of Google’s advanced research arm, “Google X.”³⁴ Google’s main purpose in the utilization of drone technology is to “open up entirely new approaches to moving goods-including options that are cheaper, faster, less wasteful and more environmentally sensitive than what’s possible today.”³⁵ But, the appeal may be less humanitarian and more monetarily based. According to projected estimates, the potential growth for the drone industry is staggering.³⁶ The estimated total domestic economic impact, released by the Association for Unmanned Vehicle Systems International, projects the drone industry to reach more than “\$82.1 billion between 2015 and 2025 – creating more than 100,000 high-paying jobs,” so long as regulation is completed by cur-

29. *Id.*

30. Jennifer Lynch, *Are Drones Watching You?*, ELECTRONIC FRONTIER FOUND. (Jan. 10, 2012), <https://www.eff.org/deeplinks/2012/01/drones-are-watching-you>.

31. BENNETT, *supra* note 8, at 3; Schlag, *supra* note 11, at 2.

32. *Winging it: Google Announces Its Own Delivery Drones Project*, THE ECONOMIST (Aug. 29, 2014), <http://www.economist.com/news/business-and-finance/21614424-google-announces-its-own-delivery-drones-project-winging-it>.

33. *Id.*

34. *Id.*

35. Dominic Rushe, *Google Reveals Home Delivery Drone Program Project Wing*, THE GUARDIAN (Aug. 29, 2014, 10:18 AM), <http://www.theguardian.com/technology/2014/aug/29/google-joins-amazon-in-testing-home-delivery-drones>.

36. See Clay Dillow, *What Is the Drone Industry Really Worth?*, FORTUNE (Mar. 12, 2013, 6:09 PM), <http://fortune.com/2013/03/12/what-is-the-drone-industry-really-worth/>.

rent deadlines.³⁷ With the potential growth of this new industry, coupled with the environmental impact on the reduction of waste and other factors,³⁸ it is clear why companies are not wasting any time preparing for their chance to capitalize on this technology.

Not only has the appeal of drone technology sparked the interest of business giants, but it has also found its way into the hands of everyday individuals who utilize the technology for recreational uses. Companies like Parrot, a French developer of hands-free communication and infotainment systems, has extended its expertise to make civil drone use possible.³⁹ Parrot has not divulged any of its recent sales figures for the sale of its civilian drones, but to provide a sense of the popularity of drones amongst private users, it is estimated that over 500,000 of Parrot's AR model drones have already been sold worldwide since 2010.⁴⁰ The application for individual users revolves around the simplistic enjoyment of flying, just like flying a model aircraft (e.g. a radio-controlled helicopter or plane).⁴¹ Given how popular owning a personalized drone is already becoming, it does not seem like the demand for drones will be diminishing anytime soon.

III. THE UNITED STATES' CURRENT REGULATION

Currently, there are mixed sentiments about the federal government's involvement in drone regulation and about what the government should particularly be accountable for. For instance, some advocate for the federal government to be predominantly accountable for regulating drones, non-governmental actors, and privacy.⁴² In contrast, there are others who feel that states should play a much larger role in governance.⁴³ The latter is essentially a blended approach, where a state will take over the responsibility for regulating drone use within its respective airspace, leaving the federal government to play

37. *Id.*

38. See NAT'L OCEANIC & ATMOSPHERIC ADMIN., UNMANNED AIRCRAFT SYSTEMS PROGRAM (2015), http://uas.noaa.gov/library/info-sheets/NOAA_UAS_Program20150808.pdf; Jason Jay, *How Tech Can Stop the Looming Food Crisis*, FORTUNE (May 1, 2015 5:00 AM), <http://fortune.com/2015/05/01/how-tech-can-stop-the-looming-food-crisis/>.

39. *About Parrot*, PARROT, <http://www.parrot.com/usa/aboutparrot/corporate-overview/> (last visited Aug. 31, 2015).

40. Corcoran, *supra* note 7.

41. See Devin Coldewey, *Drone Regulations Won't Stall Decades-Old Model Aircraft Clubs*, NBC NEWS (Feb. 21, 2015, 8:36 AM), <http://www.nbcnews.com/tech/tech-news/drone-regulations-wont-stall-decades-old-model-aircraft-clubs-n307866>.

42. BENNETT, *supra* note 8, at 2-3.

43. *Id.* at 2.

the role of monitor and support for a state's regulation, if need be.⁴⁴ Whatever the approach may be, it appears that the most contentious issue surrounding the introduction and integration of drones into the U.S. National Airspace is the threat that this technology will be used to spy on American citizens.⁴⁵ The fear stems from the ease and capability of a drone's operator to equip the device with high-powered cameras, infrared sensors, facial recognition technology, license plate readers, and a whole myriad of other Hollywoodesque attachments.⁴⁶ It should come to no surprise that there are tensions arising between security and privacy interests, but as drone technology and surveillance technology become more advanced over time, the already palpable tensions will inevitably draw to a close, as many have already suggested.⁴⁷

A. *The FAA Modernization and Reform Act of 2012 and the Federal Aviation Administration*

In 2012, in an effort to accelerate the introduction of drones into the U.S. airspace, and to curb the pressures to do so by the Unmanned Aircraft industry, Congress passed the FAA Modernization and Reform Act of 2012 (FMRA).⁴⁸ What Congress has done with the passage of FMRA is to place a significant amount of pressure on the Federal Aviation Administration (FAA), the governmental organization that is charged with the regulation of civil aviation and safety in the United States, to come up with an effective and satisfactory drone regulation by the end of 2015.⁴⁹ In the upcoming months, the FAA's role is to devise a plan that successfully integrates drones into the National Airspace by tackling the two sets of requirements set forth in the FMRA.⁵⁰

The first requirement of FMRA mandates that by August 14, 2014, the FAA must issue a final rule solely regarding the integration of "small unmanned aircraft systems" into the United States' National Airspace.⁵¹ Within this timeline, the FAA must also research and de-

44. *Id.*

45. ALISSA M. DOLAN & RICHARD M. THOMPSON II, CONG. RESEARCH SERV., R42940, INTEGRATION OF DRONES INTO DOMESTIC AIRSPACE: SELECTED LEGAL ISSUES 12 (2013).

46. *See* Lynch, *supra* note 30.

47. THOMPSON, *supra* note 25, at 1.

48. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 332(a), 126 Stat. 11 (2012).

49. DOLAN & THOMPSON, *supra* note 45, at 23.

50. *Id.*

51. § 332(b)(1).

velop a comprehensive plan to safely accelerate the integration of civil unmanned aircraft systems into the National Airspace System⁵² and to give notice of its findings.⁵³ Secondly, the FAA must publish its final rule by December 14, 2015.⁵⁴ Unfortunately, the FAA has not been able to meet the first two deadlines for several reasons, including unresolved privacy issues.⁵⁵ A recent audit report by the Office of Inspector General, which examined the concerns with the progress of integrating drones into the national airspace, identifies key areas where the FAA is experiencing the most difficulties in reigning in this monumental task, causing significant delays for the FAA to meet its deadlines.⁵⁶ First, the report notes that there are significant technological, regulatory, and management barriers that currently exist to safely integrate drones into the National Airspace.⁵⁷ Second, the FAA has not been able to reach a consensus on standards of technology that would enable drones to detect and avoid other aircraft and ensure reliable data links between ground stations and the unmanned aircraft that is controlled.⁵⁸ Third, the FAA has not established a framework for drone integration and is not effectively collecting and analyzing drone safety data for risks.⁵⁹ As a result of these delays, the “‘integration of unmanned systems will likely slip from the mandated deadline until 2017 or even later.’”⁶⁰

There are a myriad of issues hampering the FAA’s completion of the objectives that FMRA has assigned to it. While companies and individual users wait for the FAA’s answers to the complexities of devising regulation that will resolve the issues plaguing this technology, the questions now become, how is the use of drones currently governed, and can any existing regulations bring some semblance of adequate protection?

52. § 332(a)(1).

53. § 332(a)(4).

54. § 332(b)(2).

55. Memorandum from Matthew E. Hampton, Assistant Inspector Gen. for Aviation Adm’r, to FAA on FAA Faces Significant Barriers to Safely Integrate Unmanned Aircraft Systems Into Federal Aviation Administration (June 26, 2014) (on file with author).

56. *Id.* at 1-2.

57. *Id.* at 2.

58. *Id.*

59. *Id.*

60. Brian Fung, *The FAA Won’t Make Up Its Mind on Drone Rules Until 2017 – At The Earliest*, WASH. POST (Dec. 10, 2014), <http://www.washingtonpost.com/blogs/the-switch/wp/2014/12/10/the-faa-wont-make-up-its-mind-on-drone-rules-until-2017-at-the-earliest/>.

B. The Federal Aviation Administration's Current Stance on Drones as Commercial Instruments and for Individual Use

As of today, the FAA has limited commercial drone use to a handful of circumstances since “there are no means to obtain authorization for commercial [drone] operations in the [National Airspace].”⁶¹ These exceptions only apply to companies that have acquired a Section 333 Exemption, which grants commercial use in low-risk, controlled environments, or that have been granted a Special Airworthiness Certificate (SAC) to be used for the sole purposes of conducting: (1) research and development, (2) market surveys, and (3) crew training.⁶² Unfortunately, beside these exceptions, there is currently no other way for businesses to get the FAA’s permission to begin utilizing drone technology for commercial applications.

On the other hand, the private use of drones is relatively unrestricted under the FAA’s current regulations. In accordance with FMRA’s guidelines, the FAA has provided individual users with specific rules regarding a drone’s private use.⁶³ First, the aircraft must be used strictly for hobby or recreational use.⁶⁴ Second, the aircraft must be operated in accordance with a “community-based” set of safety guidelines.⁶⁵ Third, the aircraft cannot exceed 55 pounds.⁶⁶ Fourth, the aircraft must be operated in a manner that does not interfere with and gives way to manned aircraft.⁶⁷ Fifth, if the aircraft is flown within five miles of an airport, the operator of the device must notify air traffic control.⁶⁸ Lastly, the aircraft must be flown within a visual line of sight of the person operating it.⁶⁹ After examining these particular rules, what becomes clear is how sparse the current regulation and rules governing individual use are. For one, the rule mandating that the aircraft be operated in accordance with a “community-based” set of guidelines is vague, at best. The FAA does not even specify what constitutes “community-based” guidelines, which could ultimately leave

61. *National Unmanned Aircraft Systems Project Office Frequently Asked Questions*, U.S. GEOLOGICAL SURVEY, <http://rmgsc.cr.usgs.gov/uas/faqs.shtml> (last updated Mar. 13, 2015).

62. *Civil Operations (Non-Governmental)*, FAA, http://www.faa.gov/uas/civil_operations/ (last updated Mar. 17, 2015, 10:42 AM).

63. *See What Can I Do With My Model Aircraft?*, FAA, http://www.faa.gov/uas/publications/model_aircraft_operators/ (last modified Aug. 12, 2014, 10:29 AM).

64. *Id.*

65. *Id.*

66. *Id.*

67. *Id.*

68. *Id.*

69. *Id.*

an individual drone user questioning whether he or she is operating the drone lawfully.

To further add to the problem, the violations that the FAA discovers are met with an inconsistent application of its rules.⁷⁰ For instance, on October 17, 2011, the FAA fined Raphael Pirker \$10,000 for operating a small drone in the proximity of the University of Virginia's campus, which had been recording videos and pictures, for which Pirker was compensated by the university for promotional purposes.⁷¹ However, on March 6, 2014, in an unpublished decision, the FAA's authority appeared to be hampered when an administrative judge for the National Transportation Safety Board (NTSB) found that there "was no enforceable FAA rule . . . applicable to the model aircraft or for classifying model aircraft as an UAS."⁷² The NTSB's finding ultimately made the FAA's ability to enforce its own penalties impossible.⁷³

Rulings like these create uncertainty in the power of the FAA, prompting some to argue that despite the significant need to ensure that the public's safety and privacy are protected, the FAA does not have the necessary authority to even address the privacy issue caused by the integration of drones.⁷⁴ The argument stems from what the FAA is actually authorized to do under FMRA. As it is known, the FAA is tasked with ensuring the safety and efficiency of air travel, but FMRA does not expressly give authority to the FAA to regulate privacy.⁷⁵ Another argument is that the FAA has not historically regulated privacy as it pertains to "persons or things on the ground" nor does it have the technical expertise to undertake such regulations.⁷⁶

To combat these arguments, one must look at section 332(a)(2)(1)⁷⁷ and section 332(a)(2)(A)(iii)⁷⁸ of FMRA. These sections plainly state that "the plan under paragraph (1) shall contain, [']at a minimum['] . . . establish[ed] standards and requirements for

70. See Marc Warren, *UAS Integration: A Call to Action*, 27 AIR & SPACE LAW., no. 2, 2014, at 1, 23.

71. *Huerta v. Pirker*, No. CP-217, 2014 N.S.T.B. WL 338863, at *1 (N.T.S.B. Mar. 6, 2014).

72. *Id.* at *5.

73. See Hank Perrit & Eliot O. Sprague, *Seeking Law Abiding Drones: What to Tell Clients that Want to Use Drones in Their Business*, 2014 A.B.A. SEC. BUS. L. TODAY. 1, http://www.movoaviation.com/images/business_law_today_drones-201410.authcheckdam.pdf.

74. DOLAN & THOMPSON, *supra* note 45, at 23-24.

75. *Id.* at 2, 19.

76. *Id.* at 24.

77. FAA Modernization and Reform Act of 2012, *supra* note 48, at § 332(a)(2)(1).

78. § 332(a)(2)(A)(iii).

the operator and pilot of a civil unmanned aircraft system . . .”⁷⁹ The interpretation of this particular section may seem to indicate that Congress, through FMRA, has broadly bestowed the FAA with the power to establish what the FAA deems necessary to carry out FMRA’s main objective, which is to “develop a comprehensive plan to safely accelerate the integration of civil unmanned systems into the national airspace.”⁸⁰ This intent is indicated by the language, “at a minimum.”⁸¹ Arguably, this language implies that the FAA can also expand the list of provisions in section 332 to establish standards and requirements regarding the protection of privacy. But whatever the case may be, it is another hurdle that the FAA must overcome.

C. *The Privacy Concerns*

With uncertainty revolving around the FAA’s power to deter drone users from operating drones in an unauthorized fashion, what legal safeguards are in place to protect the everyday citizen? It has been noted that “states have a loose [and] largely [unproven] framework in place for regulating nongovernmental, aerial surveillance.”⁸² When actually applying state legislative framework, things become muddled “because the Fourth Amendment’s prohibition against unreasonable searches and seizures applies only to the actions of government officials, surveillance by private actors, like the paparazzi, a commercial enterprise, or one’s neighbor is instead regulated by state and federal statutes and judicial decisions.”⁸³ Since January 2013, more than 30 states have introduced drone-related legislation in response to the growing concerns about citizens’ safety.⁸⁴ Certainly, the use of drone technology by the federal government, for purposes like domestic surveillance, triggers the implication of Fourth Amendment rights and other laws applicable to privacy.⁸⁵ However, citizens are not just concerned with government intrusion, but also the potential of intrusion by private sector users.⁸⁶ In the latter case, what assurances do citizens have about private actors who might use drones in a man-

79. § 332(a)(2)(1)-(A)(iii).

80. § 332(a)(1).

81. § 332(a)(2)(1).

82. BENNETT, *supra* note 8, at 12.

83. DOLAN & THOMPSON, *supra* note 45.

84. Joan Lowy, *Civilian Drones Come With Both Risk and Reward*, HUFFINGTON POST (Mar. 20, 2013, 8:51 AM), http://www.huffingtonpost.com/2013/03/30/civilian-drones_n_2984127.html.

85. DOLAN & THOMPSON, *supra* note 45, at 12.

86. *Id.*

ner that could very easily infringe upon a citizen's fundamental privacy rights?

The best way to describe the current legal landscape regarding drone use is that “[it] is a crazy quilt of regulations, policy pronouncements and state laws, with many significant pieces missing.”⁸⁷ The problem stems from the fact that explicit privacy jurisprudence has not always been available.⁸⁸ For protection, people had to turn to the legal theories of property law and trespass, which served as a “proxy” for the protection of individual privacy.⁸⁹ However, these legal theories have been regarded by some to be no longer viable and have been inadequately keeping up with a rapidly changing society and an even faster evolution of technology.⁹⁰ Today, explicit privacy laws exist in the realm of tort law. Under tort law, the right to privacy entails four distinct rights but the most applicable is the concept of intrusion upon seclusion.⁹¹ Thus, how does the tort concept of “intrusion upon seclusion” aid in the defense against unwanted drone surveillance by private parties? First, there are two elements that need to be satisfied.⁹² The first element is that a person must intentionally and physically intrude upon the solitude or seclusion of another, or of his private affairs.⁹³ Second, the intrusion must be highly offensive to a reasonable person.⁹⁴ To illustrate the applicability to drone operations, this tort claim would apply when a person is in a private environment, like her home, and her actions within that private environment are filmed or photographed by a drone. But unfortunately, an intrusion of one's privacy by a drone will not always perfectly match a scenario like the one presented above, prompting the question, are we adequately protected against the dangers of this technology?

D. *The Effects of an Uncertain Drone Regulation on Civil Operations*

As the FAA attempts to work out the kinks in drone regulation, companies like Amazon and Google have grown impatient, forcing

87. Michael Berry & Nabih Syed, *The FAA's Slow Move to Regulate Domestic Drones*, WASH. POST (Sept. 24, 2014), <http://www.washingtonpost.com/news/volokh-conspiracy/wp/2014/09/24/the-faas-slow-move-to-regulate-domestic-drones/>.

88. *Id.*

89. DOLAN & THOMPSON, *supra* note 45, at 12.

90. *Id.*

91. RESTATEMENT (SECOND) OF TORTS §§ 652B – 652E (1977).

92. *Id.* § 652B.

93. *Id.*

94. *Id.*

them to examine other avenues and venture into other countries to find more favorable legislative conditions in which to test this technology.⁹⁵ For instance, Google has taken advantage of Australia's lax regulations on the use of drones and has begun using its drone prototypes to deliver supplies to remote farms in Australia's Outback.⁹⁶ Delayed regulations of civilian drone use in the United States means that "the current regulatory void has left American entrepreneurs and others either sitting on the sidelines or operating in the absence of appropriate safety guidelines."⁹⁷ For this reason, companies are either going abroad or are choosing to take matters into their own hands by beginning to operate commercial drones without express legal authorization. As the pressure mounts on the FAA to come up with viable standards that will hopefully produce successful regulation, the reality of the matter still remains a mystery as to what will happen in coming months.

Currently, what is certain is that the FAA controls domestic licensing of drone operations and is ultimately responsible for determining where domestic drones can be used.⁹⁸ For the time being, the FAA only has regulations in place that define minimum safe operating altitudes for different kinds of "fixed-wing aircraft,"⁹⁹ and it has yet to provide definitive regulation to govern the application of civilian drone use.¹⁰⁰ Now, the legal community is simply trying to determine what pre-existing legal standards should be applied to this technology, as we await for the FAA's proposed "Drone Regulation." Despite the FAA's capability of actually overseeing drone technology from technical perspectives, the FAA is unfortunately ill-equipped to prevent inevitable invasion of privacy issues that are knocking at its door, due to

95. Troy A. Rule, *FAA Should Curb Its Regulatory Authority Over Commercial Drone Use*, L.A. TIMES (Nov. 19, 2014, 6:09 PM), <http://www.latimes.com/opinion/op-ed/la-oe-rule-drone-regulation-faa-20141120-story.html>.

96. *Winging it*, *supra* note 32.

97. Daniel Rothberg, *FAA Under Pressure as Clamor for Small Commercial Drones Grow*, L.A. TIMES (May 1, 2014, 3:00 AM), <http://www.latimes.com/nation/la-na-drones-faa-20140501-story.html#page=1>.

98. Joseph J. Vacek, *Big Brother Will Soon Be Watching-or Will He? Constitutional, Regulatory, and Operational Issues Surrounding the Use of Unmanned Aerial Vehicles in Law Enforcement*, 85 N.D. L. REV. 673, 674 (2009).

99. "Generally, outside of takeoff and landing, fixed-wing aircraft must be operated at an altitude that allows the aircraft to conduct an emergency landing without undue hazard to persons or property on the surface. In congested areas, the aircraft must operate at least 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft. The minimum safe operating altitude over non-congested areas is 500 feet above the surface." DOLAN & THOMPSON, *supra* note 45, at 2.

100. *Id.*

the high risk of domestic drone use.¹⁰¹ Unfortunately, in the U.S., the only guidance available to law makers for protecting the privacy of its citizens is the Fourth Amendment, the FAA Modernization and Reform Act of 2012, and vague references to common law privacy principles regulating the private sector. Even though the U.S. may appear to be unprepared at the moment to regulate this technology within its current legislative framework, drone technology is able to legally thrive in other countries.¹⁰² In fact, our European neighbors are much more successful at tackling the regulatory issues presented by drone technology.

IV. INFLUENCE DRIVING CURRENT EUROPEAN STRATEGIES TO INCORPORATE DRONE TECHNOLOGY IN A CIVILIAN CAPACITY

Much like the United States, Europe intends to capitalize on the limitless potential for growth as the emergence of new technology propels the drone industry to new heights.¹⁰³ According to the European Commission, due to the maturation of civil drone technology, the drone industry is forecasted to create an estimated 150,000 European jobs, while also growing the industry's net worth from \$5.2 billion euros to 11.6 billion euros by 2023.¹⁰⁴ With the seemingly limitless potential for this industry's growth in Europe, pressures from Europe's drone industry is also making waves, pushing for the creation of clear legislation that will allow for the rapid integration of drones into Europe's National Airspace.¹⁰⁵

Following the U.S. Congress's push for the FAA to aggressively begin its accelerated plan towards streamlining drone regulation, the European community also called for the progression and integration of its own drone technology, commonly referred to as Remotely Piloted Aircraft Systems (RPAS) during the European Summit on December 19, 2013.¹⁰⁶ In response to this call to action, the European Commission, the executive body of the European Union responsible

101. Schlag, *supra* note 11, at 2.

102. *Id.*

103. European Comm'n Press Release IP/14/, The Comm'n, European Comm'n Calls for Tough Standards to Regulate Civil Drones (Apr. 8, 2014) [hereinafter Press Release].

104. *Communication from the Commission to the European Parliament and the Council, A New Era for Aviation: Opening the Aviation Market to the Civil Use of Remotely Piloted Aircraft Systems in a Safe and Sustainable Manner*, at 3-4, COM (2014) 207 final (Aug. 4, 2014) [hereinafter *Communication*].

105. *Id.* at 9.

106. *Id.* at 2.

for legislation and the implementation of decisions,¹⁰⁷ began devising ways to integrate the civilian use of drones while also responding to the European manufacturing and services industry's hope to remove "barriers to the introduction of [drones] in the European Single market."¹⁰⁸ Within the European Commission's "Communication on Civil Drones," the Commission conveyed its views, in April 2014, about "how to address RPAS operations in a European level policy framework which will enable the progressive development of the commercial [drone] market while safeguarding the public interest."¹⁰⁹ Similar to the FMRA, the Commission's Communication has issued a timeline and requirements to focus on constructing legislative standards that will uniformly apply to the European community.

First, the regulatory preconditions regarding the integration of drones in the European Airspace must be established by 2016.¹¹⁰ Second, the development of these proposed uniform standards must address strict European Union wide rules on safety authorization.¹¹¹ This means that the EU must provide an equivalent level of safety regarding the civilian use of drones as is afforded to manned aircraft.¹¹² Further, the new standards must also contain rigid controls on privacy and data protection.¹¹³ This is perhaps one of the biggest concerns in developing an effective regulatory scheme for drone technology. What the Commission hopes to accomplish with the standard is to have drone operations comply with applicable data protection rules, and ensure that data protection authorities monitor the collection and processing of such data.¹¹⁴ There must also be controls to ensure security of the airspace.¹¹⁵ Since drones can be operated in a potentially unlawful manner around "manned" aircraft, the European Aviation Safety Agency (EASA) must develop the necessary security requirements to mitigate risk so they can be enforced by national authorities.¹¹⁶ Additionally, there must be a clear framework for liability and insurance, as current standards are established mostly for manned

107. EUROPEAN UNION, *THE EUROPEAN UNION EXPLAINED: HOW THE EUROPEAN UNION WORKS* 5 (2013).

108. *Communication*, *supra* note 104, at 2.

109. *Id.*

110. *Id.* at 5.

111. Press Release, *supra* note 103.

112. *Id.*

113. *Id.*

114. *Id.*

115. *Id.*

116. *Id.*

aircraft.¹¹⁷ Lastly, the new standards of regulation must also focus on streamlining research and development and supporting new industries incorporating drone technology.¹¹⁸ With the European Commission laying out the strategy for its own drone regulations, the European community is awaiting more concrete regulation that will help guide the operation of drones in Europe's National Airspace. Unlike the United States, Europe's integration of drone technology appears to be progressing quite smoothly, especially when tackling the universal problem of privacy protection.¹¹⁹

A. *How Europe's Current Legal Frame Work is Facilitating Drone Regulation Regarding Privacy Protection*

In its November 2014 report, the European Commission released its final study, conducted by Trilateral Research & Consulting and Vrije Universiteit Brussel, which analyzed concerns about privacy protection associated with the use of drones in the European National Airspace and provided a thorough explanation of why current legislation is adequate for drone regulation.¹²⁰ The report comprehensively examined the legislative framework currently in place for the protection of European citizens from unlawful data collection and privacy intrusions.¹²¹ This report begs the question: how are European citizens protected?

First, Article 7¹²² and Article 8¹²³ of the Charter of Fundamental Rights of the European Union have been determined to provide adequate safeguards against drone applications in relation to privacy issues related to the use of aerial technologies for photography and surveillance.¹²⁴ Article 7 of the Charter specifically addresses the respect for private and family life.¹²⁵ This Article states that "everyone has the right to respect for his or her private family life, home and

117. *Communication*, *supra* note 104, at 8.

118. *Id.* at 6.

119. Loek Essers, *European Drone Companies Should Address Privacy Issues, Lawyer Says*, PC WORLD (Apr. 12, 2012, 4:40 AM), http://www.pcworld.com/article/253640/european_drone_companies_should_address_privacy_issues_lawyer_says.html.

120. See RACHEL L. FINN, DAVID WRIGHT, LAURA JACQUES & PAUL DE HERT, *STUDY ON PRIVACY, DATA PROTECTION AND ETHICAL RISKS IN CIVIL REMOTELY PILOTED AIRCRAFT SYS. OPERATIONS* (2014).

121. *Id.*

122. Charter of Fundamental Rights of the European Union art. 7, Oct. 26, 2012, 2012 O.J. (C 326) 391 [hereinafter Charter].

123. *Id.* art. 8.

124. Charter, *supra* note 122, at 391.

125. *Id.* art. 7.

communications.”¹²⁶ Article 8 of the Charter relates to the protection of personal data, stating, “(1) Everyone has the right to the protection of personal data concerning him or her. (2) Such data must be processed fairly for specified purposes and on the basis of the consent of the person concerned or some other legitimate basis laid down by law.”¹²⁷ At first glance, the Charter does not appear to be any more comprehensive in its protection of a person’s privacy than the common law tort of intrusion upon seclusion. But the key to Europe’s regulatory success is owed to a combination of factors, such as the legal framework that is already found in many European Union states, such as the United Kingdom, France, Germany, Italy, Sweden, Denmark, and Belgium, since these nations allow drone missions.¹²⁸

These member states are important for the U.S. to examine because of how uniformly they have all adopted and legislated for the adherence to the EU Data Protection Directive and e-Privacy Directive.¹²⁹ First, these countries adopted two types of relevant legislation, which appears to be helpful. The first set of legislation “encompasses the right to privacy, the data protection law and the privacy law governing the telecommunication and network service sector.”¹³⁰ The second set of legislation that these countries adopted are laws “related to surveillance, including [Closed Circuit Television] systems regulations and surveillance regulations in the law enforcement sector.”¹³¹ Because the general applications of these laws are considered to be “data-neutral,” there is a reduced risk of their general application to drones becoming outdated, which also prevents the “fundamental rights” of the European public from being negatively impacted by the vastly expanding technology of drones.¹³²

Presently, European residents are better protected under the “law from privacy intrusions by unmanned aircraft than people on U.S. soil.”¹³³ The reason behind this is a “baseline privacy law that the

126. *Id.*

127. *Id.* art. 8; *see also* Data Protection Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of Such Data, 1995 O.J. (L 281) 31 (EC) (a key component in EU’s privacy laws, which regulates what happens when personal data is collected, processed, or stored and provides for protection of individuals with regard to the processing of personal data and on the free movement of such data).

128. *See* FINN ET AL., *supra* note 120, at 53.

129. *Id.* at 122.

130. *Id.*

131. *Id.*

132. *Id.* at 128.

133. Essers, *supra* note 119.

U.S. lacks,”¹³⁴ coupled with the autonomy that European countries may exercise regarding the protection of their citizens’ privacy rights.¹³⁵ Unlike the United States, which has not yet authorized the commercial use of drones beyond those that fit the exemptions above,¹³⁶ it appears that the European community has been more receptive (perhaps due to a stronger framework of privacy laws) to the integration of drones in civilian life.¹³⁷ Even though the current state of Europe’s drone regulation has not been perfected, Europe’s current legal framework governing drones is still years ahead of the United States’ regulations. Because of this pre-existing framework, regulation to help foster a better atmosphere for commercial and individual consumer use of drone technology is arguably made easier in Europe.

V. CONCLUSION

Ultimately, the United States could learn from Europe’s examples of implementing data neutral legislation to prevent regulation from becoming obsolete in the face of rapidly developing drone technology. As discussed above, the United States has ineffectively collected and analyzed drone safety for data risks, which is something that the European Commission specifically mandated. This has caused major delays in providing the current drone industry and individual users with any semblance of viable guidelines. Even though the FAA is feeling the pressure to churn out new regulations, it may be wiser for the FAA to take as much time as it needs in order to get drone regulation “right,” even if it is at the cost of the U.S. drone industry’s economic and technological development.

With the introduction of drones into American airspace, a number of legal and policy question will be raised, with the focal point surrounding the level of privacy citizens should expect in an age when technology facilitates the acquisition of personal information.¹³⁸ In the end, drones will be changing the way we view the world, as “[h]igh-rise buildings, security fences or even the walls of a building are [no longer] barriers to increasingly common drone technology.”¹³⁹ While companies and individual consumers continue to explore, refine, and

134. *Id.*

135. See Voisin, *supra* note 9.

136. Conor Dougherty, *Drone Developers Considers Obstacles That Cannot Be Flown Around*, N.Y. TIMES, Sept. 1, 2014, at B5.

137. *Communication*, *supra* note 104, at 2.

138. THOMPSON, *supra* note 25, at 21.

139. Lowy, *supra* note 84.

exploit the benefits of drone technology for everyday use, the need for regulation that successfully protects the privacy of the public is increasingly necessary. If this can be accomplished, then surely, a future where drones are an integral part of societal function, may not be as distant as some may think. But in the meantime, as one commentator remarked, “in the absence of regulation, it’s the Wild West,”¹⁴⁰ and anything can happen.

140. Maria L. La Ganga, *Washington State Goes In Circles Over Drone Regulation*, L.A. TIMES, July 1, 2014, at A6.