DRONE ON THE FARM: THE BENEFITS AND CONTROVERSIES SURROUNDING THE FUTURE OF UNMANNED AIRCRAFT SYSTEMS IN AGRICULTURE

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I. INTRODUCTION

Technology advances at an incredible pace. Electronics are at the fingertips of every man, woman, and child giving each individual the ability to connect with someone next door, in another state, and another country. In today's society, people also have access to an unlimited amount of information via the internet and social media sites. The increase in technology advancements and information availability have led to the development of unmanned aircraft systems (UAS) commonly known as drones.[1] These systems have the greatest use in the Department of Defense,[2] but agriculturalists are finding benefits associated with their use on farms. With the newfound benefits agriculturalists recognize, other groups also recognize the ability of drones to fly over the private property of others without permission. This Note strives to address the typical use of drones and their future in the agriculture industry, specifically on farms. Moreover, the Note will evaluate the benefits and harms of drones, controversies surrounding their use, and privacy implications.

A. Drones: The Definition and Types of Unmanned Aircraft Operations

An unmanned aircraft is defined as "an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft."[3] An unmanned aircraft system is understood to be one that includes proper communication hardware and the ability to control the aircraft to allow for safe operation in the national airspace.[4] The Federal Aviation Administration (FAA) defines an unmanned aircraft as "a device that is used, or is intended to be used, for flight in the air with no onboard pilot."[5] Essentially, it is an aircraft that does not require a pilot and can be as large as a commercial jet or smaller than remote-operated toy plane[6] and range in weight from a few ounces to nearly thirteen tons.[7]

1. Drone is a common name for an unmanned aircraft system.

2. Unmanned Aircraft Operations in the National Airspace System, 72 Fed. Reg. 6689, 6689 (Feb. 13, 2007) (to be codified at 14 C.F.R. pt. 91).

3. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 331(8), 126 Stat. 11, 72.

4. *Id*. § 331(9).

5. Unmanned Aircraft Operations in the National Airspace System, 72 Fed. Reg. at 6689.

6. Press Release, FED. AVIATION ADMIN., Fact Sheet – Unmanned Aircraft Systems (UAS) (Feb. 15, 2015) http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=18297.

Since 1990, the FAA lists drone use in endeavors such as firefighting, search and rescue, law enforcement, border patrol, and military missions.[8] Because drones are by their very nature flying machines, the FAA must take the national airspace into consideration when making rules and regulations.[9] The administration has made safety a top priority as it works to address airspace issues and integrate drones into the national airspace.[10]

Drone flight operations have been divided into four types of unmanned aircraft systems to effectively address safety and efficiently control airspace: Public UAS, Civil UAS, Model Aircraft, and Small UAS for Non-recreational Purposes.

1. Public UAS

A public UAS is defined in the FAA Modernization and Reform Act of 2012 (FRMA) as "an unmanned aircraft system that meets the qualifications and conditions required for operation of a public aircraft."[11] This definition corresponds to the United States Code stating that a public aircraft is generally an aircraft used only by a government or a political subdivision of the government.[12] There are times when an aircraft does not qualify as a public UAS under the statute. If the aircraft in question is being used for a commercial purpose or to transport someone that is not a crewmember or a qualified non-crewmember, then the aircraft cannot be considered a public operation.[13] When a public aircraft is not meeting the requisite statutory criteria for a public operation, the operation must meet all civil aircraft requirements under title 14 of the Code of Federal Regulations.[14]

2. Civil UAS

A civil UAS is best defined as an unmanned aircraft that is not used for government operations.[15] There are two ways to obtain authority to fly a civil

7. Unmanned Aircraft Operations in the National Airspace System, 72 Fed. Reg. at 6689.

8. Press Release, FED. AVIATION ADMIN., *supra* note 6.

9. *See id*.

10. *Id*.

11. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 331(4), 126 Stat. 11, 72.

12. 49 U.S.C.S. § 40102(a)(41) (LexisNexis 2014).

13. *Id*. § 40125(b); *see id*. § 40125(a)(3) (definition of a qualified non-crewmember).

14. *Id*. § 40102(a)(41)(E).

15. *Civil Operations (Non-Governmental)*, FED. AVIATION ADMIN., http://www.faa.gov/uas/civil_operations/ (last modified Mar. 17, 2015) [hereinafter *Civil Op-*

UAS in the national airspace. The FMRA Section 333 Exemption, or a Special Airworthiness Certificate granted by the FAA will allow for civil aircraft operation.[16]

3. Model Aircraft

This type of aircraft is a UAS defined as being (1) capable of sustained flight; (2) flown within the sight of the person operating the aircraft; and (3) flown only for hobby or recreational purposes.[17] Recreational purposes involve activities solely for one's own personal benefit. Any act or result of a flight that is for compensation or to be sold is not recreational.[18] Model aircraft should also not weigh in excess of fifty-five pounds unless otherwise certified.[19] The small size also allows this type of flying machine to be considered a small UAS.[20]

4. Small UAS for Non-Recreational Purposes

Under a new proposed rule from the FAA, a small UAS stays consistent with the FRMA definition of a small UAS.[21] The system is simply defined as an unmanned aircraft weighing less than fifty-five pounds.[22] These aircraft systems have been incorporated for non-recreational purposes into the national airspace through airworthiness certificates, exemptions, and certificates of waiver or authorization (COA), but the proposed rule, when finalized, would allow a small UAS to be integrated into the airspace without these approval mechanisms.[23] This opens up the door for a greater range of uses for small unmanned aircraft.

B. Historical Drone Use and Their Introduction Into Agriculture

Drone technology was developed initially for military missions and combat.[24] The flight of drones started in World War I, but these aircrafts were primi-

erations].

16. *Id*.

17. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 336(c), 126 Stat. 11, 77-78.

18. *Model Aircraft Operations*, FED. AVIATION ADMIN., http://www.faa.gov/uas/model_aircraft / (last modified Mar. 4, 2015).

19. FAA Modernization and Reform Act of 2012, § 336(a)(3).

20. *Id*. § 331(6).

21. *See* Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. 9544, 9545 (Feb. 23, 2015) (to be codified at 14 C.F.R. pt. 107).

22. *Id*.

23. *Id*.

24. *See generally* Lexi Krock, *Time Line of UAVs*, NOVA, http://www.pbs.org/wgbh/nova/spiesfly/uavs.html (last updated Nov. 2002).

tive and did not see combat.[25] In the early 1930s the UK developed the first "returnable and reusable" drone.[26] In 1944, Germany used drones beyond the combat training setting with the V-1.[27] The V-1 was not involved in direct combat, but instead it was used against British civilians.[28] In the 1960s, during the Vietnam War, drones transitioned into uses that met the needs for stealth and surveillance.[29] The 1990s brought drones that were used for other purposes such as wildfire management and environmental research, rather than strictly military uses.[30]

Today's drones are used for tasks such as border patrol, disaster relief, law enforcement, and the original use of military missions and training.[31] The development of this technology has led to the growth of drone use to also include agriculture in a growing list of applicable uses. The increase in agricultural drone use can be contributed to precision agriculture.[32] This type of agriculture uses advanced technology to assist farmers with being more efficient by cutting costs while still increasing yields and production.[33] Many people recognize the benefits of using drones in agriculture and equate it to "'a simple economic equation.'"[34] The simple equation is a drone plus cents on the dollar to result in aerial images and fast access to data for the farmer.[35] Aerial photos and data collection from drones are important to farm owners, and achieving production goals at a cheaper cost is the ideal choice.[36] The ease of flying over land for image and da-

25. *Id*.

26. *1930s, DH.82B Queen Bee (UK)*, NOVA, http://www.pbs.org/wgbh/nova/spiesfly/uavs_05.html (last visited Jan. 19, 2016).

27. *1940s V-1 (Germany)*, NOVA, http://www.pbs.org/wgbh/nova/spiesfly/uavs_07.html (last visited Jan. 4, 2016).

28. *Id*.

29. Krock, *supra* note 24.

30. *1990s to Today, Firebird 2001 (Israel)*, NOVA, http://www.pbs.org/wgbh/nova/spiesfly/uavs_15.html (last visited Jan. 19, 2016); *1990s to Today, Pathfinder (USA)*, NOVA, http://www.pbs.org/wgbh/nova/spiesfly/uavs_16.html (last visited Jan. 19, 2016); *see* Krock, *supra* note 24.

31. Press Release, FED. AVIATION ADMIN., *supra* note 6.

32. Chad Garland, *Drones May Provide Big Lift to Agriculture When FAA Allows Their Use*, L.A. TIMES, Sept. 13, 2014, http://www.latimes.com/business/la-fi-drones-agriculture-20140913-story.html#page=1.

33. *Id*.

34. Miranda Green, *Unmanned Drones May Have Their Greatest Impact on Agriculture*, THE DAILY BEAST (Mar. 26, 2013, 4:45 AM), http://www.thedailybeast.com/articles/2013/03/26/unmanned-drones-may-have-their-greatest-impact-on-agriculture.html.

35. *Id*.

36. *See id*.

ta collection is complimentary to the large size of most farms.[37] While using drones on farms is not a common occurrence at this time, the demand for drones and the advantages these systems provide are growing.[38]

II. PARTIES INTERESTED IN DRONE USE FOR AGRICULTURAL PURPOSES

A. Governmental Drone Use

1. Advantages of Government Use of Drones in Agriculture

Drones that are utilized by a government are regulated as a public UAS.[39] Governments are currently capitalizing on drone use in areas of law enforcement.[40] But what are the advantages of a government using drones in agricultural production? Drones assist in making farming more efficient by equipping the farmer with precise data regarding the amount of a chemical needed on a field for pest management or to promote crop growth.[41] Proper application of such nutrients and chemicals can assist states in achieving conservation standards related to land and water quality.[42] Research at Kansas State University has shown that drones can assist in locating harmful algae that infringes on lakes and ponds in the state.[43] Another study evaluated environmental and genetic interactions regarding plants and the impact these interactions imposed on the vegetation.[44] The fewer negative impacts that farming has on conservation within a state should result in less state funding being spent to retain or restore a certain standard of environmental quality. Moreover, accurate detection of problems will lead to more efficient solutions regarding environmental issues.

Alabama Governor Robert Brantley established the Alabama Drone Task Force in August 2014 to analyze current laws and help address the future of

37. *See* Christopher Doering, *Growing Use of Drones Holds Promise of Ag Transformation*, ARGUS LEADER (Mar. 3, 2014, 12:25 AM), http://www.argusleader.com/story/news/2014/03/29/growing-use-drones-poised-transform-agriculture/7073585/ [hereinafter Doering, *Growing Use of Drones Holds Promise*].

38. *Id*.

39. 49 U.S.C.S. § 40102(a)(41) (LexisNexis 2014).

40. *See* Press Release, FED. AVIATION ADMIN., *supra* note 6.

41. Doering, *Growing Use of Drones Holds Promise*, *supra* note 37.

42. *See id*.

43. *Economic Impact of Drones in Agriculture*, FARMS.COM (Dec. 3, 2013), http://www.farms.com/news/economic-impact-of-drones-in-ag-in-kansas-70261.aspx; *see generally* DEON VAN DER MERWE & KEVIN P. PRICE, USING SMALL UNMANNED AIRCRAFT SYSTEMS FOR HIGH SPATIAL AND TEMPORAL RESOLUTION CHARACTERIZATIONS OF HARMFUL ALGAL BLOOMS 8-17 (2013).

44. *Economic Impact of Drones in Agriculture*, *supra* note 43.

drones in agriculture, conservation, and law enforcement.[45] The task force was expected to submit a management plan to the Governor by January 15, 2015.[46] However, the task force simply addressed a letter to the Governor in January recommending the state's department of transportation become the lead agency for drones and that the task force should be permitted to continue to study the issue.[47] Alabamians expect the impact on agriculture to be significant in areas of irrigation, soil management, plant health, and animal care.[48] Not only is Alabama's agriculture industry projected to benefit, but the state's economy and job numbers are expected to improve as well.[49]

North Carolina was commended by the Alabama Drone Task Force regarding legislation they have passed within their state.[50] The Tar Heel State has contemplated establishing its own drone board to monitor a state-funded drone program.[51] The departments of Transportation, Environment and Natural Resources, Agriculture, and Public Safety promote the integration of drone use in North Carolina government programs.[52] As of now, state and local governments are prohibited from purchasing drones until July 1, 2015 due to budgetary reasons.[53] Despite this, the Chief Information Officer in North Carolina has granted N.C. State University's Transportation Center permission to test drones at three different locations within the state.[54]

Virginia could potentially see a $342 million increase in the state's economy in the next ten years because of drone technology.[55] Virginia has been select-

45. Press Release, Office of Ala. Governor Robert J. Bentley, Governor Establishes Alabama Drone Task Force, (Aug. 22, 2014), http://governor.alabama.gov/newsroom/2014/08/governor-bentley-establishes-alabama-drone-task-force/.

46. *Id*.

47. Brian Lyman, *Alabama Drone Task Force's Recommendations Limited*, MONTGOMERY ADVERTISER, Jan. 25, 2015, http://www.montgomeryadvertiser.com/story/news/local/alabama/2015/01/26/alabama-drone-task-forces-recommendations-limited/22335069/.

48. *See* Cliff Sims, *Are Drones Poised to Have a Huge Impact on Alabama's Economy?*, YELLOWHAMMER NEWS, Aug. 25, 2014, http://yellowhammernews.com/statepolitics/drones-huge-impact-alabama/.

49. *See id*.

50. Lyman, *supra* note 47.

51. Patrick Gannon, *N.C. Sees a Future in Drones for State Government Use*, CHARLOTTE OBSERVER, Mar. 22, 2014, http://www.charlotteobserver.com/news/local/article9106034.html.

52. *See id*.

53. *Id*.

54. *Id*.

55. David Stegon, *Virginia Could See 342 Million From Drones*, STATESCOOP.COM (Oct. 16, 2014, 5:52 PM), http://statescoop.com/virginia-see-342-million-drones/.

ed by the FAA as one of the six test sites for drones across the country, which acts as an incentive for Virginia to increase and improve its drone technology developments.[56] Virginia Tech and Virginia Polytechnic Institute received certificates of authorization (COA) that allow the universities to fly an assortment of operations to test drone advancements and ensure safe operational equipment.[57] Because the state of Virginia partnered with New Jersey and Maryland in its application to be chosen as a test site, drone operations can be flown in those states also as long as they acquire a COA.[58]

From an agricultural perspective, inspections of animal feeding operations for regulatory compliance, and other regulatory reviews requiring farm visits, could potentially be conducted from the air. While completely eliminating an in-person, on-farm inspection is not ideal because one would not expect the same level of in-depth inspection from the air compared to ground inspections, a greater number of inspections could be initiated more efficiently and cost effectively via the use of drones and aerial imagery. Most state governments are focusing on the economic benefits and job growth that drone use will bring into a state overall, rather than an individual industry. A news article anticipates that between the years 2015 and 2025 the UAS industry will produce $82.6 billion and more than 100,000 new jobs.[59] Such impressive improvements will promote the advancement of the entire state and will make this technology more enticing for state governments as a whole.

2. Disadvantages of Government Use of Drones in Agriculture

Privacy invasion is the largest fear expressed by the general public when discussing the government's use of drones. Private land ownership is fundamental to farmers and ranchers and should be a priority in drone policy considerations.[60] Organizations like the American Civil Liberties Union assert that "drones should not be used without permission when it comes to the government," and most private citizens would likely agree.[61] The American Farm Bureau also maintains the stance that federal agencies should not be able to use drones for regulatory enforcement, litigation, or compilation of data without the

56. *Id*.

57. Jake Williams, *Inside the FAA's Newest Drone Test Site*, FEDSCOOP.COM (Aug. 15, 2014, 4:32 AM), http://fedscoop.com/inside-faas-newest-drone-test-site/.

58. *Id*.

59. Green, *supra* note 34.

60. *See* Robert Holly, *States Restrict Drone Use Because of Privacy Concerns*, INVESTIGATE MIDWEST (March 21, 2014), http://investigatemidwest.org/2014/03/21/states-restrict-drone-use-because-of-privacy-concerns/.

61. *Id*.

landowner's knowledge and permission.[62]

Supreme Court Justice Sonia Sotomayor has even voiced her concerns regarding American's privacy rights.[63] Justice Sotomayor spoke to an assembly at Oklahoma City University School of Law and noted that she is "particularly troubled by the potential for commercial and government drones to compromise personal privacy."[64] She went on to say that citizens should be interested in becoming involved in the privacy debate because of the changes occurring in technology.[65] By being involved in the discussion, citizens will be more informed and will be able to voice approvals and concerns surrounding drone technology and privacy decisions.

President Obama issued a Presidential Memorandum on February 15, 2015 to address "privacy, civil rights, and civil liberties" surrounding the use of drones.[66] The memorandum was directed towards the heads of executive departments and agencies.[67] The President asserted that when information was collected by UAS technology, such information must be handled in accordance to the Constitution, federal law, and other applicable regulations and policies such as the Privacy Act of 1974.[68] President Obama also declared agencies shall review policies and procedures relating to information collected by drone operations before the release of new technology, and at a minimum, this review should be completed every three years.[69] Three requirements are required to be adopted into agency policies and procedures:

(i) *Collection and Use*. Agencies shall only collect information using UAS, or use UAS-collected information, to the extent that such collection or use is consistent with and relevant to an authorized purpose.

(ii) *Retention*. Information collected using UAS that may contain [personally identifiable information] shall not be retained for more than 180 days unless retention of the information is determined to be necessary to an authorized mission of the retaining agency, is maintained in a system of records covered by the

62. *See Data Privacy*, Am. Farm Bureau Fed'n (Aug. 2015), http://www.fb.org/issues/docs/dataprivacy15.pdf.

63. *See* Jacob Gershman, *Sotomayor: Americans Should Be Alarmed by Spread of Drones*, WALL STREET J., Sept. 12, 2014, http://blogs.wsj.com/law/2014/09/12/justice-sotomayor-americans-should-be-alarmed-by-spread-of-drones/.

64. *Id*.

65. *Id*.

66. Presidential Documents, Promoting Economic Competitiveness While Safeguarding Privacy, Civil Rights, and Civil Liberties in Domestic Use of Unmanned Aircraft Systems, 80 Fed. Reg. 9355, 9355 (Feb. 20, 2015).

67. *Id*.

68. *Id*.

69. *Id*. at 9355-56.

Privacy Act, or is required to be retained for a longer period by any other applicable law or regulation.

(iii) *Dissemination*. UAS-collected information that is not maintained in a system of records covered by the Privacy Act shall not be disseminated outside of the agency unless dissemination is required by law, or fulfills an authorized purpose and complies with agency requirements.[70]

Such measures will help ensure citizen information is managed appropriately and privacy rights are held in high regard.[71]

Monetary constraints can have a negative impact on government use.[72] State governments operate, most often, on tight budgets and drone prices have a very wide range of cost. One article estimates costs from several hundred dollars to greater than $15,000.[73] Other sources set top drone prices at $160,000, but this high end is for a military-style drone.[74] Missouri is not overly enthusiastic about the aerial mapping aspect of drone use, and does not foresee the state's department of transportation embracing this technology in the future.[75] A Missouri Department of Transportation (MoDOT) Assistant Engineer said it is cheaper for Missouri to bid out the mapping projects to private industry rather than purchase its own drone or fleet.[76] Conversely, a digital media manger remarked that the use of a drone can "get [the job] done faster, and it would save a lot of taxpayer dollars."[77] The MoDOT estimates an aerial mapping project of a five mile piece of interstate will cost $115,000 for a private company to conduct without the use of drones.[78] North Carolina estimates that initial costs for a drone program could reach $850,000.[79] This number does not include operation, maintenance, and

70. *Id*. at 9356.

71. *See id*.

72. *See* Gannon, *supra* note 51 (noting the budget and funding will affect the Governor's decision in establishing a state drone program and board to oversee the program).

73. Creighton Hayes, *Could Government Agencies Benefit from Drones?*, KOMU.COM (Sept. 11, 2014, 6:28 PM), http://www.komu.com/news/could-government-agencies-benefit-from-drones-/.

74. Christopher Doering, *Growing Use of Drones Poised to Transform Agriculture*, USA TODAY (Mar. 23, 2014, 7:18 AM), http://www.usatoday.com/story/money/business/2014/03/23/drones-agriculture-growth/6665561/ [hereinafter Doering, *Growing Use of Drones*].

75. Hayes, *supra* note 73.

76. *Id*.

77. *Id*. (quoting Adam Weber, a digital media manager with The Evoke Group in Columbia, MO).

78. *Id*.

79. Gannon, *supra* note 51 (initial costs include purchasing aircraft, equipment, and hiring pilots and staff).

storage.[80] Yearly costs for a drone program could add up to approximately $565,000 in aircraft operation, management, and data storage.[81]

B. Drone Use for Commercial Purposes

1. Advantages of Using Drones in a Commercial Setting

Agriculture is predicted to benefit significantly from the commercialization of drone use. The commercial industry is where the greatest economic benefits for agriculture are expected to be found.[82] Iowa is projected to create 1,200 new jobs and experience a $950 million impact in the economy over the next ten years from drones.[83] Some companies are already set up to provide data collection from surveying to farmers as well as sell drones and drone equipment to farm owners and operators.[84]

The American Farm Bureau notes data collection in a fast, farm-wide manner, as the largest advantage of private drone use.[85] Notably from the standpoint of "real-time information gained at a micro-level unit" this is a significant improvement in data collection compared to past technology used to gain similar data.[86] This advanced data collection will serve to better assist with farm management practices related to crop production and livestock management.[87] Ultimately, it should allow for increased production, more efficient management, and lower input costs for chemicals applied to fields.[88]

The FAA, in February 2015, released a proposed rule for small UAS that allows them to fly in the national airspace for commercial operations provided the aircraft and operator meet certain requirements.[89] The rule specifically lists aerial photography and precision agriculture as potential small UAS markets,[90] and lists crop monitoring and inspection along with aerial photography and wild-

80. *See id*.

81. *Id*. (when combining yearly data storage and management with aircraft operation and maintenance).

82. Doering, *Growing Use of Drones*, *supra* note 74 ("[Eighty percent] of the commercial market for drones will eventually be for agricultural uses").

83. *Id*.

84. Doering, *Growing Use of Drones Holds Promise*, *supra* note 37.

85. *Data Privacy*, *supra* note 62.

86. *Id*.

87. Doering, *Growing Use of Drones Holds Promise*, *supra* note 37.

88. *See generally id*.

89. *See* Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. 9544, 9546-47 (Feb. 23, 2015) (to be codified at 14 C.F.R. pt. 107).

90. *Id*. at 9578.

life evaluations as operations that may be conducted.[91] The FAA also estimated that the initial cost to become a small UAS operator and satisfy owner fees is approximately $214, with each recurrent year costing $164.[92] A commercial vehicle license for less than $300 is considered to be inexpensive and will not result in much of a negative impact on business owners.[93] However, the FAA has not been able to determine how many entities will benefit from this rule because market development cannot be predicted.[94]

Previously, the FAA would have to grant commercial flight authorizations to companies, such as AeroVironment, so the company could legally operate the aircraft.[95] AeroVironment is a drone manufacturer that is partnered with BP and has used a drone to survey BP pipelines, roads, and equipment in Alaska.[96] One of the expected benefits of the proposed rule is to allow for "an opportunity to substitute small UAS operations for some higher risk manned flights, such as inspecting towers, bridges, or other structures."[97] Surveying pipelines in Alaska could likely be encompassed within this opportunity.

2. Disadvantages of Drones Used for Commercial Purposes

Current FAA regulations do not allow the use of drones for commercial purposes unless a permit is obtained from the FAA because the only rule in existence that would allow for such operations is currently still in the proposal stage although the comment period for the rule ended on April 24, 2015. As a result, the agricultural improvements and economic advantages of using drones for commercial purposes are still speculative.

Safety is the reason that the FAA has not issued any regulations prior to February 2015 for commercial drone use that would not require the FAA to grant an exemption or airworthiness certificate.[98] One of the FAA's main goals is to protect the U.S. airspace and protect those on the ground in case of drone malfunctions or crashes.[99] Because drones cannot see, there is fear of collisions in the

91. *Id*. at 9545.

92. *Id*. at 9580.

93. *See id*.

94. *Id*.

95. Bart Jansen, *FAA Approves First Commercial Drone Over Land*, U.S.A. TODAY (June 10, 2014, 12:30 PM), http://www.usatoday.com/story/money/business/2014/06/10/faa-drones-bp-oil-pipeline-aerovironment-north-shore/10264197/.

96. *Id*. (at the largest oil fields in the U.S.).

97. Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. at 9547.

98. Press Release, FED. AVIATION ADMIN., *supra* note 6; *see* Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. at 9548.

99. *See* Scott Mayerowitz, *Drone Revolution Draws Near, but Big Obstacles Remain*,

national airspace with other aircraft.[100] This fact is noted in the new proposed small UAS rule.[101] The rule recognizes two safety concerns: (1) whether the person operating the drone will be able to see and avoid manned aircraft, and (2) the possibility of a failure in communication between the operator of the small UAS and the small UAS itself.[102] A drone falling from the sky has been compared to "'a four-or five-pound brick coming out of the sky.'"[103] However, the larger the drone, the more significant the "brick" if an impact with someone or something occurs. From a larger perspective, a drone is still much smaller in size than a manned aircraft and would cause less damage in a crash situation.[104]

Privacy issues cause some hesitation with commercial use just as they do with government use of drones. Ryan Calo, a law professor at the University of Washington School of Law, has noted that surveillance has progressed much faster than privacy law.[105] He notes that people cannot see what is wrong with privacy laws, but they can imagine what such surveillance would be like.[106] This indicates that commercial entities will need to be extra cautious of privacy laws because the area of privacy law can, and likely will, change drastically in the coming years.

The biggest issue associated with data collection is tied to "property rights and 'who owns and controls the data.'"[107] The American Farm Bureau Federation worries that companies may sell or use collected data in marketing schemes, despite assurances to keep the information private.[108] Moreover, a continued rise in opposition to conventional farming practices creates a greater risk for farmers should any private farm data be released.[109] Consequently, proper protection of data collected from drone use is of high importance to farmers and farm organizations.

YAHOO (Jan. 7, 2015), https://www.yahoo.com/tech/s/drone-revolution-draws-near-big-obstacles-remain-061858867.html.

100. *See id*.

101. *See* Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. at 9548-49.

102. *Id*.

103. Mayerowitz, *supra* note 99 (quoting Maryanna Saenko, Lux Research analyst).

104. Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. at 9548.

105. Daisy Carrington & Jenny Soffel, *Fifteen Ways Drones Will Change Your Life*, CNN (Nov. 18, 2013, 5:23 AM), http://www.cnn.com/2013/11/03/business/meet-your-friendly-neighborhood-drones/.

106. *Id*.

107. *Data Privacy*, *supra* note 62.

108. *Id*.

109. *See id*.

C. Drones Used by the Private Citizen

1. Advantages of Private Citizens Using Drones

Private citizens, such as modern farmers, can benefit greatly from using drones on their farms. The aerial systems can be used for monitoring livestock, crop production, and to check fences and water supply.[110] Crops are currently monitored by satellites and walking the fields, which is time consuming, and even more time is consumed by waiting long periods to get satellite data results returned.[111] Overseeing crop management via a drone can allow for faster data access and detection of problem areas in a field.[112] A drone can "cover six to seven times more area than a tractor in the same amount of time," and gather more information during that flight.[113] Not to mention, large scale livestock producers can employ drones to check on the health of livestock and their location to assist injured or lost animals more quickly.[114]

Better monitoring control can go beyond live plants and animals and assist with ensuring fences are in proper repair and water supplies are adequate.[115] Producers could potentially use water-landing drones to measure water quality.[116] This information can help better manage nutrient runoff to ensure the best water quality near their farm.[117] The South Dakota Farm Bureau Executive Director predicts more than one third of farmers in South Dakota will be using drones in their operations by 2017.[118]

Drone uses in precision agriculture settings allow producers to use the exact amounts of pesticides, fertilizer or other crop applications that are in need on their land.[119] This will not only permit farmers to save money by not over apply-

110. Doering, *Growing Use of Drones Holds Promise*, *supra* note 37.

111. *Id*.

112. *See id*.

113. Andy Stevenson, *Drones and the Potential for Precision Agriculture*, ALLTECH, http://www.alltech.com/blog/posts/drones-and-potential-precision-agriculture (last visited Jan. 19, 2016).

114. *Drones Have 'Unlimited Potential' in Ag, Goehring Says*, GRAND FORKS HERALD, Dec. 30, 2013, http://www.grandforksherald.com/content/drones-have-unlimited-potential-ag-goehring-says.

115. Doering, *Growing Use of Drones Holds Promise*, *supra* note 37.

116. Mary Claire Jalonick, *Unmanned Drones to Help Farmers*, HERALD SUN, Feb. 4, 2015, http://www.heraldsun.com.au/business/breaking-news/unmanned-drones-to-help-farmers/story-fni0xqe4-1227207670297?nk=dffce60acbd80287d66954b0e2c59e4d.

117. Doering, *Growing Use of Drones Holds Promise*, *supra* note 37.

118. *Id*.

119. *Id*.

ing, but the environment will benefit as well.[120] Applying the precise amount of chemicals needed for best crop utilization will result in reduced runoff into nearby rivers and streams.[121] Most farm use of drones could be classified as commercial use since the drones will be used for the business purposes of farm management, with the intent of earning a profit.[122] Consequently, a farmer will need to obtain the proper commercial flight permit and exemptions.[123]

2. Disadvantages of Private Citizens Using Drones

As with drone use in other areas, safety is still a large concern and an important issue.[124] There is still the possibility of a drone malfunctioning or an operator error occurring and causing harm to bystanders.[125] The see and avoid concerns are still relevant for private citizen use because these aircraft, like commercial operation aircraft, are unable to detect and avoid manned aircraft.[126] While physical harm is an issue that requires consideration, private property rights are another aspect that requires significant attention.

The animal rights group PETA has been documented searching for drones to use in surveillance for monitoring hunters and flying over "factory farms" and "'other venues where animals routinely suffer and die.'"[127] Even people outside of these groups and organizations acting as casual hobbyists can still use a drone to make videos and take photos to post on internet sites such as YouTube or other social media sites.[128] Moreover, as drones continue to become more economical for the everyday citizen, a greater amount of drones will be purchased and found in the air.[129]

Supreme Court Justice Sotomayor called surveillance technology frighten-

120. *Id*.

121. *Id*.

122. *See id*.

123. *See* Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. 9544 (Feb. 23, 2015) (to be codified at 14 C.F.R. pt. 107).

124. Michael Berry & Nabiha Syed, *The Possible Perils of Private Drones*, WASHINGTON POST, Sept. 22, 2014, http://www.washingtonpost.com/news/volokh-conspiracy/wp/2014/09/22/the-possible-perils-of-private-drones/.

125. *Id*.

126. *See id*.

127. Lauren Russell, *PETA Eyes Drones to Watch Hunters, Farmers*, CNN (Apr. 12, 2013, 12:43 PM), http://www.cnn.com/2013/04/11/us/animal-rights-drones (quoting statement by PETA).

128. Joseph Serna, *As Hobby Drone Use Increases, So Do Concerns About Privacy, Security*, L.A. TIMES, June 21, 2014, http://www.latimes.com/local/la-me-drone-hobbyist-20140622-story.html.

129. *Id*.

ing and noted that Americans should be more concerned about their privacy regarding drone use.[130] One of Justice Sotomayor's statements shows her concern about private property protection:

> There are drones flying over the air randomly that are recording everything that's happening on what we consider our private property. That type of technology has to stimulate us to think about what is it that we cherish in privacy and how far we want to protect it and from whom. Because people think that it should be protected just against government intrusion, but I don't like the fact that someone I don't know. . . can pick up, if they're a private citizen, one of these drones and fly it over my property.[131]

Some states have enacted legislation to deal with the issue of privacy and drone operations by individuals.[132] These laws will be discussed later in the Note.

D. International Drone Use

Drones have already been introduced in several international countries where their benefits have been quickly recognized and put to work.[133] For example, Japan uses drone technology for ninety percent of crop spraying.[134] Like Japan, Australia has also been using drones since the 1980s.[135] Canada has an advantage over the United States in the drone industry because companies can export drones and associated technology without Canadian government approval.[136] Canadians also are not regulated as heavily as U.S. operators; the drone must only remain in the sight of the flight controller.[137] China is home to a global market leader in small-scale consumer drones.[138] However, this market leader, SZ DJI Technology Co., has noted problems with their drones as the drone model

130. Gershman, *supra* note 63.

131. *Id*.

132. Holly, *supra* note 60.

133. *See* Caleb Garling, *Drone, Drone on the Range*, MODERN FARMER (July 8, 2013), http://modernfarmer.com/2013/07/drones-drones-on-the-range/.

134. Stevenson, *supra* note 113.

135. Mark Koba, *Drone Gap? U.S. May Have One in Farming, Say Experts*, CNBC (Oct. 9, 2014, 11:52 AM), http://www.cnbc.com/id/102071305#.

136. David Common, *Drones Go Commercial, Take on Tasks from Industry to Farming*, CBC NEWS (May 30, 2014, 11:54 AM), http://www.cbc.ca/news/technology/drones-go-commercial-take-on-tasks-from-industry-to-farming-1.2657036.

137. *Id*.

138. Jack Nicas & Colum Murphy, *Who Builds the World's Most Popular Drones?*, THE WALL STREET JOURNAL, Nov. 10, 2014, http://www.wsj.com/articles/who-builds-the-worlds-most-popular-drones-1415645659.

will "go haywire and fly away, sometimes never to be seen again."[139] But the company accepts responsibility and recognizes there are areas for improvement.[140]

Drone use in France has had more success and a longer time to examine how civilian drone use can work best since its legislation was adopted in the spring of 2012.[141] In fact, an industrial data company CEO says that drone uses should not be blocked because civilians will fly them regardless, and authorization for flight actually allows for better control of in-flight drones.[142] France's regulations cover both recreational and commercial uses and the economic benefits can be seen in every industry.[143] The country has put the aerial systems to work on building or repairing roads, power lines, and other important infrastructure.[144] Recently, agriculture and other industries have started to experiment with drone use more in depth.[145] One farmer, Jean-Baptiste Bruggeman, has been using drone technology for several months on his 210 hectare farm to photograph fields with infrared, near infrared, and visible wavelengths.[146] Bruggeman has access to the collected data within forty-eight hours, along with instructions from agronomists at a Paris data company that analyzes his data.[147] The only step remaining to receive all the benefits of the data is to upload the information to his GPS-equipped tractor.[148] The tractor adjusts to the proper application specifications for each part of the field the tractor is covering at the time.[149]

Even with this success, France has still needed to address security issues.[150] Most recently, drones have been flying over French nuclear reactors and military stations.[151] These flight paths cause even greater concern in the wake of terrorist attacks in Paris, which occurred just weeks prior to the drone sightings over these

139. *Id*.

140. *Id*.

141. Joseph Bamat, *What France Can Teach Obama About Civilian Drones*, FRANCE24.COM, http://www.france24.com/en/20150129-france-civilian-drone-legislation-lessons-usa-obama/ (last updated Jan. 29, 2015).

142. *Id*.

143. *Id*.

144. *Id*.

145. *Id*.

146. *The Robot Overhead*, THE ECONOMIST (Dec. 6, 2014), http://www.economist.com/news/technology-quarterly/21635326-after-starting-their-career-armed-forces-drones-are-now-entering-civilian.

147. *Id*.

148. *Id*.

149. *Id*.

150. Bamat, *supra* note 141.

151. *Id*.

areas.[152] The French are receiving pressure from experts asking for professional certification for small drones to be easier, while certification for flying larger and heavier drones would be harder to obtain.[153] The main concern behind these suggestions and the encouragement for change is due largely to safety or difficulty of operation.[154] Regardless, France currently claims the largest number of drone owners in Europe, having approximately 1,600 companies with drone ownership.[155]

III. LEGAL ISSUES: THE LAWS AND REGULATIONS OF DRONE USE

A. Federal Aviation Administration Regulations

1. Public UAS Regulatory Requirements

A public entity that wishes to fly a UAS may apply for a Certificate of Waiver or Authorization (COA).[156] The application and review process by the FAA generally takes sixty business days.[157] The authorization is effective for a specific period of time which is generally up to two years.[158] The COA outlines specific areas where the drone may fly, the purpose for its flight, and provisions for operation to ensure the safety of others.[159] The purpose of the COA is to "ensure a level of safety equivalent to manned aircraft."[160] To achieve this, in addition to the COA and its limitations, the aircraft must be monitored by a person on the ground or by a manned aircraft in the air.[161]

The proposed rule does intend to offer flexibility regarding COA policies without eliminating the COA program for public aircraft operations.[162] By doing so, the proposed rule would allow the entity to forgo obtaining a COA from the FAA provided they met the requirements of the new proposed CFR part 107 and

152. *Id.*; *see also Charlie Hebdo Suspects Killed, Several Hostages Die at Paris Market*, FRANCE 24 (Jan. 9, 2015), http://www.france24.com/en/20150109-france24-liveblog-charlie-hebdo-shooting-terrorist-suspects-enters-third-day/ (Paris attack article).

153. Bamat, *supra* note 141.

154. *Id.*

155. *Id.*

156. *Public Operations (Governmental)*, FED. AVIATION ADMIN., http://www.faa.gov/uas/public_operations/ (last modified Aug. 25, 2015).

157. *Id.*

158. *Id.*

159. *Id.*

160. *Id.*

161. *Id.*

162. Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. 9544, 9554-55 (Feb. 23, 2015) (to be codified at 14 C.F.R. pt. 107).

state they are flying as a civil operation.[163] This decision is voluntary and gives the entity more freedom in their drone operations.[164]

2. Civil UAS Regulatory Requirements

The FMRA section 333 exemption or a special airworthiness certificate will allow for civil aircraft operation.[165] The aircraft is required to be registered with the FAA before applying for an airworthiness certificate.[166]

An airworthiness certificate can be classified as standard or special.[167] A standard certificate encompasses "normal, utility, acrobatic, commuter, or transport"[168] aircraft, as well as manned free balloons and special classes[169] of aircraft as determined by the FAA.[170] A special certificate is for "primary,[171] restricted,[172] limited,[173] light-sport,[174] and provisional"[175] aircraft[176] while also covering special flight permits[177] and experimental[178] aircraft.[179] A civil UAS is required to have a special airworthiness certification to fly in the national airspace

163. *Id*.

164. *Id*.; *see also* FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 333, 126 Stat. 11, 75-76.

165. *See Civil Operations*, *supra* note 15.

166. 49 U.S.C.S. §§ 44102(a), 44103 (LexisNexis 2014) (aircraft registration and registration requirements).

167. 14 C.F.R. § 21.175 (2015).

168. *Id*. §§ 21.175(a), 21.184 (requirements and standards for the issuance of the standard airworthiness certificates for normal, utility, acrobatic, commuter, and transport aircraft; manned free balloons; and special classes of aircraft).

169. *See id*. §§ 21.17(b), § 21.183 (special class aircraft airworthiness and type certificates).

170. *Id*. § 21.175(a).

171. *See id*. §§ 21.24, 21.184 (issuance standards and requirements for primary category aircraft certificates).

172. *See id*. §§ 21.25, 21.185 (requirements and standards for issuance of restricted type category aircraft certificates).

173. *See id*. § 21.189 (requirements and standards for issuance of limited category aircraft certificates).

174. *See id*. § 21.190 (requirements and standards for issuance of light-sport category aircraft certificates).

175. *See id*. §§ 21.71-.85, 21. 211-.225 (provisional airworthiness certificates).

176. *Id*. §21.175.

177. *See id*. §§ 21.197, 21.199 (special flight permits generally and the requirements and standards for issuance of special flight permits).

178. *See id*. §§ 21.19, 21.193, 21.195 (experimental certificate purposes, experimental certificates generally, and any experimental certificates relating to aircraft for market surveys, sales demonstrations, and customer crew training).

179. *Id*. § 21.175(b).

unless an airworthiness certificate for the flight has been issued to the specific UAS in question.[180] Currently, the only types of special airworthiness certificates available for civil drone use are in the experimental and restricted categories.[181]

Agricultural practices can be found listed under the restricted category for special purpose operations.[182] A special purpose operation includes agricultural practices, conservation, aerial surveying, patrolling, weather control, aerial advertising, and other activities determined at the FAA's discretion.[183] The UAS cannot be used for commercial reasons or by a commercial entity at this time unless approved by the FAA.[184] The proposed rule for small UAS operations would allow for commercial flights provided the drone and operator meets the necessary requirements.[185] The proposed rule will be discussed later in this Note.

An audit in June 2014 conducted by the Office of the Inspector General found that the FAA was behind schedule in meeting requirements in the FMRA such as selecting test sites and developing various plans.[186] The FAA has achieved only nine of the seventeen UAS requirements in the FMRA, but deadlines for these were not met on time and they are not fully implemented yet, such as the proposed UAS rule that was expected in August 2014 but was not released until February 2015.[187]

3. Model Aircraft Regulatory Requirements

Operating standards were outlined in the early 1980s and operators are strongly encouraged to follow the Advisory Circular.[188] These standards include,

180. *Special Airworthiness Certification*, FED. AVIATION ADMIN., http://www.faa.gov/aircraft/air_cert/airworthiness_certification/sp_awcert/experiment/sac/ (last modified Sept. 12, 2014) [hereinafter *Special Airworthiness*].

181. OFFICE OF THE INSPECTOR GEN., U.S. DEP'T OF TRANSP., FAA FACES SIGNIFICANT BARRIERS TO SAFELY INTEGRATE UNMANNED AIRCRAFT SYSTEMS INTO THE NATIONAL AIRSPACE SYSTEM 3 (2014), *available at* https://www.oig.dot.gov/sites/default/files/FAA%20Oversight%20of%20Unmanned%20Aircraft%20Systems%5E6-26-14.pdf [hereinafter FAA FACES SIGNIFICANT BARRIERS] (currently there are: 300 active public-use authorizations, eighteen experimental special airworthiness certificates, and two restricted category airworthiness certificates for over 100 aircraft types).

182. 14 C.F.R. § 21.25.

183. *Id.* § 21.25(b).

184. *Special Airworthiness Certification*, *supra* note 180; *see* Jansen, *supra* note 95 (commercial flight to survey BP pipelines roads and equipment in Alaska has approval, and that is why it can be operational).

185. *See generally* Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. 9544, 9546 (Feb. 23, 2015) (to be codified at 14 C.F.R. pt. 107) (summary chart).

186. FAA FACES SIGNIFICANT BARRIERS, *supra* note 181.

187. *Id.*

188. FED. AVIATION ADMIN., ADVISORY CIRCULAR 91-57 (1981).

but are not limited to, flying the aircraft no higher than 400 feet, keeping away from highly populated areas, and avoiding manned aircraft.[189] Model aircraft may operate outside of FAA authority[190] provided the operator meets and follows specific parameters in the FMRA.[191]

The main factor classifying a UAS as a model aircraft is its use for hobby or recreation and nothing else.[192] Model aircraft systems are required to be less than fifty-five pounds, unless otherwise approved.[193] The small size adds to the concept that the aircraft will only be used for recreational purposes.

The FAA's proposed small UAS rule excludes model aircraft from operating under the new proposed rule if the aircraft meets all the standards in section 336 of the FMRA classifying it as model aircraft flown for hobby or recreational purposes.[194] This section is relatively straight forward and easy to comprehend except for one component that raises questions. Section 336(a)(2) states that model aircraft have to operate in accordance with community-based safety guidelines and within a national community-based organization.[195] A Senate Conference Committee Report defines a community based organization as a "membership based association that represents the aeromodeling community within the United States . . . ."[196] The Academy of Model Aeronautics is considered to be such organization and strives to promote the "advancement and safeguarding of modeling activities."[197] This seems to require a person operating a model aircraft to seek out safety guidelines for the community area they intend to fly in.

4. Small UAS Regulatory Requirements

The FAA released a proposed rule regarding the operation of small un-

189. *Id*.

190. *What Can I Do With My Model Aircraft?*, FED. AVIATION ADMIN., https://www.faa.gov/uas/publications/model_aircraft_operators/ (last modified Aug. 12, 2014).

191. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 336(c), 126 Stat. 11, 77-78.

192. *Id*. § 336(a)(1).

193. *Id*. § 336(a)(3).

194. Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. 9544, 9555 (Feb. 23, 2015) (to be codified at 14 C.F.R. pt. 107). *See generally* FAA Modernization and Reform Act of 2012, § 336.

195. FAA Modernization and Reform Act of 2012, § 336(a)(2).

196. JOINT EXPLANATORY STATEMENT OF THE COMMITTEE OF CONFERENCE, FAA MODERNIZATION AND REFORM ACT OF 2012, H. REP. NO 122-381, at 199-200 (2012), *available at* http://www.gpo.gov/fdsys/pkg/CRPT-112hrpt381/pdf/CRPT-112hrpt381.pdf.

197. ASS'N FOR UNMANNED VEHICLE SYS. INT'L, KNOW BEFORE YOU FLY: UNMANNED FLIGHT SAFETY GUIDANCE (2014), *available at* http://knowbeforeyoufly.org/wp-content/uploads/2015/01/KBYF_Brochure.pdf.

manned aircraft systems on February 23, 2015.[198] The rule would add a new part to the CFR that would apply specifically to small UAS.[199] Current regulations pertaining to airworthiness provisions, airman certification provisions, and operating limitations would be replaced by the proposed rule.[200] There are still areas that part 107 would not apply to due to other laws and regulations such as air carrier operations, international operations, and foreign aircraft that are ineligible to be registered in the United States.[201]

The rule defines a small unmanned aircraft as weighing less than fifty-five pounds.[202] The small UAS under the rule will not have a pilot-in-command as other definitions of a UAS do.[203] Instead, the rule will create the positions of operator and visual observer to replace the pilot-in-command.[204] The operator is "a person who manipulates the flight controls of a small UAS" and is most similar to the pilot-in-command position.[205] The visual observer will act as an aid to the operator, if he/she wishes, and is defined "as a person who assists the small unmanned aircraft operator in seeing and avoiding other air traffic or objects . . . ."[206] Even though the operator may not be required to watch the drone at all times if a visual observer is assisting, the operator and observer must be able to reasonably communicate with each other regarding the drones location at all times.[207] Most importantly, the operator must be the one in control at all times,[208] but if the operator is aided by a visual observer, the operator is permitted to look away for lengths of time provided the visual observer maintains constant sight of the aircraft.[209] The drone must stay in a visual line of contact at all times to satisfy the see-and-avoid requirement and prevent any accidents from occurring.[210] For proper certification and licensing, the operator would still have to

198. Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. at 9544.

199. *Id*. at 9553.

200. *Id*.

201. *Id*. (rule "would not apply to (1) air carrier operations; (2) external load and towing operations; (3) international operations; (4) foreign-owned aircraft that are ineligible to be registered in the U.S.; (5) public aircraft; (6) certain model aircraft; and (7) moored balloons, kites, amateur rockets, and unmanned free balloons.").

202. *Id*. at 9556.

203. *Id*.

204. *Id*. at 9556, 9559.

205. *Id*. at 9558.

206. *Id*. at 9559.

207. *Id*.

208. *Id*.

209. *Id*.

210. 14 C.F.R. § 91.113(b) (2015).

obtain an airman certificate.[211] This is a statutory requirement even though the operator is not a pilot because he/she would still be considered a crew member under the law and is acting as a pilot would by controlling the aircraft.[212] The operator has other requirements that must be met as well. A minimum age of seventeen and a passing score on an aeronautical knowledge test is a way for the FAA to ensure the operator is mature and understands proper drone management.[213]

In terms of actual drone flight, the aircraft may only operate during the day and in Class G airspace, no higher than 500 feet, no faster than 100 mph, no operations in Class A airspace are allowed,[214] and it may only operate in Class B, C, D, and E airspace with permission from ATC.[215] Additionally, the operator is required to conduct a preflight inspection and proceed with the operation only if weather visibility is at least three miles from the operator's location.[216] The aircraft must also be registered in the same manner as all other aircraft used in flight.[217] Each of these proposals and requirements are crafted to keep the national airspace as safe as possible.

B. State Drone Laws

As drones have made their appearance known in various industries, states have taken notice. Some states have chosen to enact legislation to control drone use by protecting citizen's private property rights and regulating surveillance.[218] In 2013, there were forty-three states that considered drone issues at some time during their legislative session.[219] Of those forty-three states, nine had already enacted laws that will go into effect over the next couple of years.[220]

Most legislation in 2013 was focused primarily on law enforcement and requiring a probable cause warrant in order to collect information for court pro-

211. Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. at 9558.

212. *Id*.; 49 U.S.C.S. § 40102 (LexisNexis 2014).

213. Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. at 9546.

214. Class A airspace is 18,000 feet or above. *Id*.

215. *Id*.

216. *Id*.

217. *Id*.; 49 U.S.C.S. §§ 44101(a), 44103.

218. *See* Allie Bohm, *Status of Domestic Drone Legislation in the States*, AM. CIVIL LIBERTIES UNION (Feb. 15, 2013, 12:15 PM), https://www.aclu.org/blog/technology-and-liberty/status-domestic-drone-legislation-states [hereinafter Bohm, *Status of Domestic Drone*].

219. *Id*.

220. *Id*.

ceedings.[221] However, each state legislature had certain things they wanted to address specifically. Some bills banned using drones as a weapon or required reporting on by law enforcement agencies to understand exactly how drones work on the job; others required law enforcement to present reasons for needing a drone to local government before actual purchases could be made.[222] Rural, farm focused states such as Idaho, however, included "special protections from aerial surveillance for farmers and ranchers."[223]

Legislation differed noticeably from state to state as legislatures addressed private property rights.[224] Massachusetts[225] and Rhode Island[226] proposed bills that only allow identification of the target sought by the warrant and drone.[227] Any other information is prohibited from being sought out and any information obtained during other drone flights is inadmissible in court.[228] Rhode Island requires such incidental information to be deleted within a twenty-four hour period.[229] The Massachusetts[230] and North Dakota[231] bills focused on First Amendment protected actions and bars surveillance based on these activities.[232]

At the other end of the spectrum, the North Dakota bill would have allowed incidentally collected information from drone flights to be admissible in court.[233] An Arizona bill stated that only U.S. citizens will be protected from spying drones and any drone surveillance operation requires a warrant.[234] Montana's[235] law prohibits any private use of a drone to collect admissible evidence, and Texas focuses on prohibiting drone imagery.[236] Most states, including Texas, recognize

221. Allie Bohm, *Drone Legislation: What's Being Proposed in the States?*, AMERICAN CIVIL LIBERTIES UNION (Mar. 6, 2013, 3:15 PM), https://www.aclu.org/blog/technology-and-liberty-national-security/drone-legislation-whats-being-proposed-states [hereinafter Bohm, *Drone Legislation*].

222. *Id*.

223. *Id*.; *see also* IDAHO CODE ANN. § 21-213(2)(a)(ii) (2015).

224. Note that not all bills discussed are enacted in their respective states.

225. S.B. 1664, 188th Gen. Court (Mass. 2013).

226. H.B. 5780, 2013 Leg. Sess. (R.I. 2013).

227. Bohm, *Drone Legislation*, *supra* note 221.

228. *Id*.

229. H.B. 5780, 2013 Leg. Sess. (R.I. 2013); Bohm, *Drone Legislation*, *supra* note 221.

230. S.B. 1664, 188th Gen. Court (Mass. 2013).

231. H.B. 1373, 63rd Leg. Assemb., 2013 Sess. (N.D. 2013).

232. Bohm, *Drone Legislation*, *supra* note 221.

233. H.B. 1373, 63rd Leg. Assemb., 2013 Sess. (N.D. 2013); Bohm, *Drone Legislation*, *supra* note 221.

234. H.B. 2574, 51st Leg., 1st Reg. Sess. (Ariz. 2013); Bohm, *Drone Legislation*, *supra* note 221.

235. *See* MONT. CODE ANN. §46-5-109 (2015).

236. TEX. GOV'T CODE ANN. §§ 423.001-.004 (West 2015); Bohm, *Drone Legislation*, *su-*

"image" to include "sound waves, thermal, infrared, ultraviolet, visible light, or other electromagnetic waves, odor," or other factors surrounding real property or an individual.[237] By prohibiting such a broad field that includes photography, First Amendment issues may be raised.[238] Notably for Texas, the law fails to define surveillance which is where the First Amendment controversies may arise where news companies are concerned.[239] Other states have looked at prohibiting any evidence collection, prohibiting anyone to use a drone in domestic airspace without permission from the landowner, and have been very specific regarding when a drone may be used for court purposes or with a court order.[240]

In 2014, four new states enacted legislation bringing the total of states with active laws to thirteen.[241] Illinois updated its 2013 law to include "law enforcement access to information gathered by third-party drones."[242] Tennessee passed an additional law to include "private use of drones to document hunting and fishing."[243] The Volunteer state had originally passed a law in 2013 covering law enforcement drone use and policy.[244] Despite failure, or success, the bills in 2014 focused more on the information gathered incidentally from lawful drone use, and rights to that information, rather than primarily pinpointing law enforcement by requiring them to obtain a probable cause warrant before any investigations that may involve drones.[245] The American Civil Liberties Union contributes this change of emphasis to be a contributing factor in a slower drone legislation movement.[246]

C. Fourth Amendment Drone Activity

The Fourth Amendment, and the rights associated with it, begins with the

pra note 221.

237. TENN. CODE ANN. § 39-13-901(1) (2015); TEX. GOV'T CODE ANN. § 423.001.

238. *See* U.S. CONST. amend. I.; TENN. CODE ANN. § 39-13-901(1); TEX. GOV'T CODE ANN. § 423.001.

239. TEX. GOV'T CODE ANN. § 423.001; *see* U.S. CONST. amend. I.

240. Bohm, *Drone Legislation*, *supra* note 221.

241. Allie Bohm, *Status of 2014 Domestic Drone Legislation in the States*, AMERICAN CIVIL LIBERTIES UNION (Apr. 22, 2014 10:30 AM), https://www.aclu.org/blog/technology-and-liberty/status-2014-domestic-drone-legislation-states [hereinafter Bohm, *Status of 2014 Domestic Drone*].

242. *Id.*; 725 ILL. COMP. STAT. ANN. 167/40 (West 2015).

243. Bohm, *Status of 2014 Domestic Drone*, *supra* note 241; *see* TENN. CODE ANN. §§ 70-4-301 – 303.

244. Bohm, *Status of 2014 Domestic Drone*, *supra* note 241. *See generally* S.B. 796, 180th Gen. Assemb., 1st Reg. Sess. (Tenn. 2013).

245. Bohm, *Status of 2014 Domestic Drone*, *supra* note 241.

246. *Id.*

statement that people have a "reasonable expectation of privacy" as described by Justice Harlan in his concurrence to *Katz v. United States*.[247] Justice Harlan laid out a two part test: (1) "a person ha[s] exhibited an actual (subjective) expectation of privacy" and (2) "that the expectation be one that society is prepared to recognize as 'reasonable.'"[248] Applying this analysis to the home, to curtilage, and to open fields is but one step in the direction of understanding Fourth Amendment drone surveillance impact on agriculture and what is generally accepted as reasonable for privacy purposes.[249]

1. The Home

The Court has said that the basic Fourth Amendment principle is that "private residences are places in which the individual normally expects privacy free of governmental intrusion not authorized by a warrant, and that expectation is plainly one that society is prepared to recognize as justifiable."[250] Methods to learn about the interior of a home that cannot be discovered by examining the outside, is considered an unconstitutional search.[251] In 2001, the Court decided in *Kyllo v. United States* that the use of advanced technologies, not in the possession of the general public, to inform the people of what is inside a house, is unconstitutional.[252] However, the dissent notes that the majority's new rule "apparently dissipates as soon as the relevant technology is 'in general public use.'"[253] This decision could have certain implications if and/or when drones become a common, general use item because of the Court's decision to make gathered information unconstitutional if the technology used is *not available to the general public*.[254] The court does not address technology that is general public use because in *Kyllo* thermal imaging is not "routine."[255] Drone use to see inside the home has much more implications in regard to law enforcement than drone use for agriculture. However, understanding protections provided to the home sets the stage for understanding the protections, or lack thereof, of the area surrounding the home.

247. Katz v. United States, 389 U.S. 347, 360 (1967).

248. *Id*. at 361.

249. *See* U.S. CONST. amend. IV.

250. United States v. Karo, 468 U.S. 705, 714 (1984).

251. *Id*. at 715.

252. Kyllo v. United States, 533 U.S. 27, 34 (2001).

253. *Id*. at 47.

254. Taly Matiteyahu, *Drone Regulations and Fourth Amendment Rights: The Interaction of State Drone Statutes and the Reasonable Expectation of Privacy*, 48 Colum. J.L. & Soc. Probs. 265, 274 (2015).

255. Kyllo, 533 U.S. at 39 n.6.

2. Curtilage

Curtilage is "considered part of the home itself for Fourth Amendment purposes"[256] as it "is the area to which extends the intimate activity associated with the 'sanctity of a man's home and the privacies of life.'"[257] This area is considered protected because an average person reasonably expects to experience privacy in the space immediately surrounding the home.[258] But, how far does this immediate area around a house extend? Moreover, it is an outdoor space, and the question arises of whether open areas can be protected. In *California v. Ciraolo*, the Court found that police in navigable airspace on a routine flight operation do not have to have a warrant to "search" your curtilage; as such it is not a violation of the Fourth Amendment.[259] The Court goes on to state that with technology advancements and routine flights "it is unreasonable . . . to expect . . . plants were constitutionally protected from being observed with the naked eye from an altitude of [one-thousand] feet."[260] Moving forward, if drones regularly operate in navigable airspace and in compliance with altitude laws, curtilage surveillance may become more popular and not violate Fourth Amendment protections.[261] Will this mean that barns or large gardens near homes will be subject to expectation that surveillance is okay in the future? The opinions of the public may also shift if drone surveillance becomes more common; society may adapt and curtilage surveillance will become more acceptable and reasonable.[262] Even with a shift of public opinion, it is still unlikely that homeowners happily allow surveillance near the area around their home.

3. Open Fields

As an agriculturalist, open fields are something of great importance for crop and livestock production. Just as important is the knowledge that "the special protection accorded by the Fourth Amendment to the people in their 'persons, houses, papers, and effects,' is not extended to the open fields."[263] The Court in *Oliver v. United States* found that even with 'No Trespassing' signs, activities conducted out-of-doors and in an open area are subject to the open fields

256. Oliver v. United States, 466 U.S. 170, 180 (1984).

257. *Id.*; Boyd v. United States, 116 U.S. 616, 630 (1886)).

258. *Oliver*, 466 U.S. at 180.

259. Cal. v. Ciraolo, 476 U.S. 207, 215 (1986).

260. *Id.*; *see also* Katz v. United States, 389 U.S. 347, 351 (1967) (stating that "[w]hat a person knowing exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection").

261. Matiteyahu, *supra* note 254, at 278.

262. *Id.*

263. U.S. CONST. amend. IV; Hester v. United States, 265 U.S. 57, 59 (1924).

rule with no Fourth Amendment protection.[264] From an agricultural perspective, the Court specifically lays out that "[t]here is no societal interest in protecting the privacy of those activities, such as the cultivation of crops, [which] occur in open fields."[265]

In another case, the Court held that authority granted to the Environmental Protection Agency by Congress,[266] in combination with open fields, allowed the EPA to take aerial photos while flying above Dow Chemical's industrial plant complex.[267] Moreover, the Court determined that the complex was an open field because the area cannot be covered up to dispel observation from the air, despite signification measures to prevent ground level observations.[268] As UAS technology develops, will concentrated animal feeding operations be seeing EPA inspect facilities with drones like those in *Dow Chemical*? Questions such as this will have to be answered over time.

IV. CONCLUSION

Drone technology is becoming increasing popular for a variety of reasons. Agriculture has risen to the forefront as a contender for seeing prominent success in the industry by incorporating drone technology into farming practices. Because the technology is so new, it will take time to see exactly how advanced drones can become and the extent that they can be used in production settings. Developing along with drone technology are the rules released by the FAA, state laws, and court decisions. These legal authorities will play a very large and significant part in the future of unmanned aircraft systems. Regardless of what the future holds in these areas and equipment improvement, it is likely that drones will certainly make an impact on agriculture in a progressive market setting.

264. Oliver v. United States, 466 U.S. 170, 173-74, 183-84 (1984).
265. *Id*. at 179.
266. Dow Chem. Co. v. United States, 476 U.S. 227, 233 (1986).
267. *Id*. at 239.
268. *Id*. at 237-38.