2015

State Labs of Federalism and Law Enforcement 'Drone' Use

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> It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country. This Court has the power to prevent an experiment. We may strike down the statute which embodies it on the ground that, in our opinion, the measure is arbitrary, capricious, or unreasonable.[1]

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1. *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting).

I. Introduction

By early 2015, fourteen U.S. states had enacted laws that circumscribe law enforcement use of unmanned aerial systems (UAS), otherwise known as drones.[2] The legislation runs the gamut of permissive to restrictive and even utilizes different terms for the same object of regulation, UAS.[3] These laws are the

2. *See* NAT'L CONFERENCE OF STATE LEGISLATURES, ROBOCOPS: FROM PHONES TO DRONES 1 (2014), http://www.ncsl.org/documents/cj/RobocopsHandout.pdf (listing Alaska, Florida, Idaho, Illinois, Indiana, Iowa, Louisiana, Montana, North Carolina, Oregon, Tennessee, Texas, Utah, and Wisconsin). In California, law enforcement use UAS and in 2011 the Governor vetoed a bill which would have required a warrant for any use except in cases of environmental emergencies. *See* Phil Willon & Melanie Mason, *Governor Vetoes Bill That Would Have Limited Police Use of Drones*, L.A. TIMES (Sept. 28, 2014), http://www.latimes.com/local/political/la-me-ln-governor-vetoes-bill-to-limit-police-use-of-drones-20140928-story.html (last visited June 1, 2015) (explaining the Governor's motivation for rejecting the bill and the reactions to his veto) (on file with the Washington and Lee Law Review). And in the summer of 2015, state laws regulating law enforcement UAS use went into effect first in Virginia and then North Dakota. *See* Andrea Noble, *Drones Cleared for Takeoff in Virginia, But Law Enforcement Agencies Aren't Ready*, USA TODAY (June 30, 2015), http://www.washingtontimes.com/news/2015/jun/30/drones-cleared-for-takeoff-in-virginia-but-law-enf/?page=all (last visited Aug. 30, 2015) [hereinafter *Virginia*] (describing the June 30, 2015 end of Virginia's moratorium on law enforcement UAS use, beginning July 1, Virginia law enforcement may utilize UAS pursuant to the terms of a warrant or in case of specified emergency conditions including search and rescue and disaster assistance) (on file with the Washington and Lee Law Review); Jeff Ward-Bailey, *North Dakota Becomes First State to Legalize Weaponized Police Drones*, CHRISTIAN SCI. MONITOR (Aug. 27, 2015) http://www.csmonitor.com/Technology/2015/0827/North-Dakota-becomes-first-state-to-legalize-weaponized-police-drones (last visited Aug. 30, 2015) [hereinafter *North Dakota*] (discussing North Dakota's law regulating law enforcement UAS use, which took effect August 1, 2015 and authorizes use subject to a warrant or in accordance with exceptions to warrant requirements) (on file with the Washington and Lee Law Review). This Article was substantively completed prior to when the Virginia and North Dakota laws took effect.

3. *See* NAT'L CONFERENCE OF STATE LEGISLATURES, *supra* note 2, at 1

confused and, at times, even contradictory, extension of societal views, perhaps most succinctly exemplified in early 2013.

In February 2013, the Federal Aviation Administration (FAA) released a list of eighty-one entities that had applied for a license to operate UAS within the United States.[4] The list included some thirty-six colleges and universities, a Native American tribal agency, and state and federal governmental entities, notably a number of police and sheriff's offices.[5]

In March 2013, a social experiment proved anecdotally revealing on what the public then thought (and perhaps still thinks) about UAS.[6] The designer labeled the exercise "Let's Check the Google Autofill."[7] She typed "drones are" in the Google search engine and then screen captured the results.[8] Google displayed the most common searches that began with "Drones are."[9] The results in order of the frequency of the search term, were that drones are: "good," "bad," "illegal," "effective," "the future," "coming," "unethical," "inaccurate," and finally, "scary."[10]

Those results convey mixed, but tending towards negative, views of UAS. And presumably for some, possibly many, the term is inextricably linked to the military UAS operating from the United States and firing missiles in other countries against suspected terrorists.[11] This varied and situational attitude towards

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(explaining the different types of regulations passed by states with regards to UAS).

4. *See 2011–2012 FAA List of Drone License Applicants*, ELECTRONIC FRONTIER FOUND., https://www.eff.org/document/2012-faa-list-drone-applicants (last visited June 1, 2015) (collecting the entities that had applied for drone license applications) (on file with the Washington and Lee Law Review).

5. *See id.* (listing Cornell University, Barona Band of Mission Indians Risk Management Office, the U.S. Department of State, and more than a dozen local law enforcement agencies among the drone license applicants).

6. *See* Caitlin Fitz Gerald, *Drones Two Ways*, DRAWNWARD.COM (Mar. 22, 2013), http://drawnward.com/2013/03/22/drones-two-ways/ (last visited June 6, 2015) (describing the investigation into the results of Google searches concerning drones) (on file with the Washington and Lee Law Review).

7. *Id.*

8. *Id.*

9. *Id.*

10. *Id.*

11. *See* Karen DeYoung, *Debate is Renewed on Control of Lethal Drone Operations*, WASH. POST (May 5, 2015), http://www.washingtonpost.comworld/national-security/debate-is-renewed-on-control-of-lethal-drone-operations

UAS was also reflected in a March 2013 Gallup poll in which 65% of the respondents thought the U.S. government should utilize armed UAS against a suspected terrorist in another country, but only 25% approved of that same use when the same suspected terrorist was in the United States.[12]

Yet it is abundantly clear that UAS are coming to the United States, though they likely will not be armed, at least with the ability to deliver lethal force.[13] Frankly, they are not only already here—they have been here. Between 2007 and early 2013, the FAA issued over 1,400 permits to domestic UAS operators.[14] By 2018,

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/2015/05/05/f096629c-f28c-11e4-bcc4-e8141e5eb0c9_story.html (last visited June 2, 2015) (relating the recent history of military drone use, and reporting that the United States has carried out an estimated 415 drone strikes in Yemen and Pakistan resulting in 962 deaths) (on file with the Washington and Lee Law Review).

12. *See* Alyssa Brown & Frank Newport, *In U.S., 65% Support Drone Attacks on Terrorists Abroad*, GALLUP (Mar. 25, 2013), http://www.gallup.com/poll/161474/support-drone-attacks-terrorists-abroad.aspx (last visited June 2, 2015) (explaining the survey's methodology and reporting its results) (on file with the Washington and Lee law Review).

13. Technically, it is not certain whether armed drones will be coming to the United States. However, unarmed police helicopters have been used for decades despite the technical capability for them to be armed. *See* EUROCOPTER, THE "FORCE MULTIPLIER" IN LAW ENFORCEMENT 22–23 (2013) (advertising the features of the latest model police helicopters). This precedent should mitigate concerns over any sudden change in policies concerning the arming of police aviation. *But see North Dakota*, *supra* note 2 (detailing that in North Dakota law enforcement may permissibly use UAS equipped with less than lethal weapons). North Dakota's legislative process is an interesting reflection of the varied concerns about law enforcement UAS as well as how the media characterizes such legislation. The initial sponsor of the legislation sought a prohibition against UAS being weaponized in any way. But when during the legislative process the possibility arose that North Dakota police might be allowed to use UAS able to deliver lethal force, the sponsor settled for systems able to deliver less than lethal force. *Id.* The legislation contains a prohibition against UAS equipped with lethal weapons. Thus, UAS equipped with less than lethal weapons would not violate the law. And while North Dakota law enforcement have indicated there are no plans to so equip UAS, media stories "allude to a dark, dismal world of legally-sanctioned robot assault . . . ." *See* Kelsey D. Atherton, *No, North Dakota Isn't Outfitting Police Drones with Tasers*, POPULAR MECHANICS (Aug. 27, 2015), http://www.popsci.com/no-north-dakota-isnt-putting-tasers-drones (last visited Aug. 30, 2015) (explaining that "it certainly doesn't seem like North Dakota is about to start outfitting their quadcopters with tasers any time soon") (on file with the Washington and Lee Law Review).

14. *See* Brian Bennett & Joel Rubin, *Drones Are Taking to the Skies in the U.S.*, L.A. TIMES (Feb. 15, 2013), http://articles.latimes.com/2013/feb/15/nation/la-na-domestic-drones-20130216 (last visited June 8, 2015) (describing the growing

the FAA estimates that as many as 7,500 commercial UAS will be operating within the United States.[15]

The FAA has proposed a framework of regulations to achieve the "safe integration of public, commercial and civil UAS" in domestic air space.[16] While you will not see delivery services like Amazon's Prime Air[17] or the TacoCopter[18]—not yet, at least—the FAA has already approved commercial UAS use "cover[ing] a wide range of operations including motion picture, flare stack inspection, crop survey and construction use."[19]

The outgrowth of domestic UAS use is by no means limited to commercial activities. Law enforcement entities around the

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multitude of domestic uses for UAS in the United States) (on file with the Washington and Lee Law Review).

15. *Busting Myths About the FAA and Unmanned Aircraft*, FED. AVIATION ADMIN. (Mar. 7, 2014, 4:44 PM), http://www.faa.gov/news/updates/?newsId =76240 (last visited Aug. 7, 2015) (on file with the Washington and Lee Law Review).

16. *See* FED. AVIATION ADMIN., OVERVIEW OF SMALL UAS NOTICE OF PROPOSED RULEMAKING (2015) (summarizing proposed regulations that include a 100 mph speed limit and 500 foot altitude limit on UAS weighing less than fifty-five pounds, a daylight-only use requirement, and the requirement that the device remain within the unaided vision of the operator).

17. *See Amazon Unveils Futuristic Plan: Delivery by Drone*, 60 MINUTES (Dec. 1, 2013), http://www.cbsnews.com/news/amazon-unveils-futuristic-plan-delivery-by-drone/ (last visited June 8, 2015) (reporting on Amazon's plan to implement a service that uses UAS to deliver packages) (on file with the Washington and Lee Law Review). Because the current FAA rules require line of sight control over UAS, Amazon is testing its autonomous aerial delivery system in Canada. *See* Emily Chung, *Amazon Tests Delivery Drones at a Secret Site in Canada—Here's Why*, CBC NEWS (Mar. 30, 2015), http://www.cbc.ca/news/technology/amazon-tests-delivery-drones-at-a-secret-site-in-canada-here-s-why-1.3015425 (last visited June 8, 2015) (describing Amazon's UAS development program in Canada) (on file with the Washington and Lee Law Review).

18. *See Flying Robots Deliver Tacos to Your Location*, TACOCOPTER, http://tacocopter.com/ (last visited June 8, 2015) (announcing a service that allows users to order tacos on their smart phone and have them delivered via UAS) (on file with the Washington and Lee Law Review). There were also short-lived attempts at UAS delivery of beer to ice fisherman in Minnesota. *See* Liz Fields, *FAA Slaps Down Drone Beer Delivery to Ice Fishermen*, ABC NEWS (Jan. 31, 2014) http://abcnews.go.com/US/faa-slaps-drone-beer-delivery-service-ice-fishermen/story?id=22314625 (last visited June 8, 2015) (describing how the "ingenious" service "had its wings clipped by the feds") (on file with the Washington and Lee Law Review). Both of these efforts, like Amazon's UAS delivery service, violate current FAA rules.

19. FED. AVIATION ADMIN., AEROSPACE FORECAST: FISCAL YEARS 2015–2035, 69 (2015).

country are also acquiring unarmed UAS.[20] Currently, a limited number of police forces in the U.S. already employ UAS to assist bomb squads,[21] photograph accident scenes,[22] and, in at least in one instance, to assist in an arrest.[23]

Americans' attitudes towards police UAS are mixed, to put it mildly.[24] Moreover, different attitudes can and certainly do exist within the same community at the same time, perhaps best illustrated in three states: Illinois, Virginia, and Washington.

Illinois enacted "The Freedom from Drone Surveillance Act" in 2013.[25] One might think this legislation protects the citizens of Illinois from such surveillance; however, the Act's exceptions allow law enforcement to use drones in several circumstances, including surveillance of suspects.[26]

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20. *See* Kaveh Waddel, *Few Privacy Limitations Exist on How Police Use Drones*, NAT'L J. (Feb. 5, 2015), http://www.nationaljournal.com/tech/2015/02/05/few-privacy-limitations-exist-on-how-police-use-drones (last visited June 8, 2015) (detailing representative examples of the motivations for law enforcement agencies to acquire UAS and the steps they must take to do so) (on file with the Washington and Lee Law Review).

21. *See* Cyrus Farivar, *Rare Cop-Owned Drone in California Could Fly Over Bay Area Soon*, ARSTECHNICA, (July 31, 2014, 10:15 AM), http://arstechnica.com/tech-policy/2014/07/rare-cop-owned-drone-in-california-could-fly-over-bay-area-soon/ (last visited June 8, 2015) (documenting the acquisition of a UAS by the San Jose Police Department for use by its bomb squad) (on file with the Washington and Lee Law Review).

22. *See* Noelle Steel, *Greenfield Police to Use Drone for Accident Probes*, INDYSTAR (Aug. 17, 2014), http://www.indystar.com/story/news/2013/08/23/greenfield-police-to-use-drone-for-accident-probes/2692295 (last visited June 8, 2015) (reporting on the acquisition of a $1,000 "drone quadcopter" by a local police force in Indiana) (on file with the Washington and Lee Law Review).

23. *See* Michael Peck, *Predator Drone Sends North Dakota Man to Jail*, FORBES (Jan. 27, 2014), http://www.forbes.com/sites/michaelpeck/2014/01/27/predator-drone-sends-north-dakota-man-to-jail (last visited June 8, 2015) (documenting the use of a Customs and Border Patrol drone to effectuate the arrest of a man in North Dakota) (on file with the Washington and Lee Law Review); *see also* Scott Bomboy, *A Legal Victory for Drones Warrants a Fourth Amendment Discussion*, CONST. DAILY (Feb. 7, 2014), http://blog.constitutioncenter.org/2014/02/a-court-victory-for-drones-warrants-a-fourth-amendment-discussion (last visited June 8, 2015) (discussing the legal issues and implications raised by the use of a Customs and Border Patrol drone in North Dakota) (on file with the Washington and Lee Law Review).

24. *See* Brown & Newport, *supra* note 12 (detailing the mixed opinions of Americans regarding the use of drones).

25. 725 ILL. COMP. STAT. 167 (2013).

26. *See id.* at 167/15 (authorizing up to 45 days of such surveillance with the

In 2013, the Virginia General Assembly passed a bill that instituted a two-year moratorium on law enforcement UAS use.[27] One day earlier, Charlottesville, Virginia became the first city in the U.S. to ban their use.[28] At the same time, Virginia Polytechnic Institute and State University competed for, and was selected by the FAA, as a UAS research and test site.[29]

In Washington, having successfully applied for a federal grant, the Seattle Police Department purchased two UAS in 2010, "envisioning uses during hostage situations and search-and-rescue operations after disaster operations."[30] However, facing public

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prior issuance of a warrant by a magistrate). Florida, by contrast, styled its legislation the "Freedom from Unwanted Surveillance Act." FLA. STAT. § 934.50 (2013). This designation raises the question as to what constitutes "wanted" surveillance and who gets to make the distinction.

27. *See* 2013 Va. Acts 755 (imposing a moratorium except during exigent circumstances such as an "Amber Alert," or a natural disaster); *see also* Jason Koebler, *Virginia Becomes First State to Pass Drone Regulations*, US NEWS (Feb. 5, 2013), http://www.usnews.com/news/articles/2013/02/05/virginia-becomes-first-state-to-pass-drone-regulations- (last visited June 9, 2015) (reporting on the reactions to the approval of the temporary ban) (on file with the Washington and Lee Law Review). *But see Virginia*, *supra* note 2 (detailing the end of the moratorium and Virginia legislation regulating law enforcement UAS use taking effect).

28. *See* Gloria Goodale, *States Consider Drone Bans: Overreaction or Crucial for Privacy Rights?* CHRISTIAN SCI. MONITOR (Feb. 6, 2013), http://www.csmonitor.com/USA/Politics/2013/0206/States-consider-drone-bans-Overreaction-or-crucial-for-privacy-rights-video (last visited June 9, 2015) (noting that UAS can "be extraordinarily useful, from crop monitoring to water management and a whole host of emergency and life-saving functions" and contending that this type of ban will disappear once the efficacy of such functions are recognized) (on file with the Washington and Lee Law Review).

29. Press Release, Fed. Aviation Admin., FAA Announces Virginia Tech UAS Test Site Now Operational (Aug. 13, 2014), https://www.faa.gov/news/press_releases/news_story.cfm?newsId=16875> (on file with the Washington and Lee Law Review). Virginia is not alone in being conflicted in its attitudes towards UAS. Groups in thirty-seven states, some with restrictive UAS laws, applied to serve as FAA test sites. *See* Richard Simon, *States in a Race to Secure Drone Testing*, L.A. TIMES (Apr. 8, 2013), http://articles.latimes.com/2013/apr/08/nation/la-na-drone-race-20130408 (last visited June 16, 2015) (reporting on the efforts within states to secure test sites and quoting an advocate for a New York-Massachusetts site as stating: "Clearly, we wouldn't be interested unless we thought there was money") (on file with the Washington and Lee Law Review).

30. Christine Clarridge, *Seattle Grounds Police Drone Program*, SEATTLE TIMES (Feb. 7, 2013, 9:33 AM), http://www.seattletimes.com/seattle-news/seattle-grounds-police-drone-program (last visited June 16, 2015) (detailing the development of the short-lived UAS program) (on file with the Washington and

outcry, the Mayor of Seattle ordered an end to the city's police UAS program before it ever started.[31] Eventually, the city transferred the UAS in 2012 to the Los Angeles Police Department, which proudly announced their acquisition.[32]

These experimenting states could have used UAS legislation to try to regulate surveillance in a broad or narrow fashion. Thus far, their efforts have avoided the former and have largely failed when addressing the latter.

Under the broad approach, states could have enacted technology-neutral legislation that addressed government surveillance regardless of the modality. This would cover government surveillance in the variety of forms it can and will take, including fixed cameras,[33] enhanced capabilities in piloted

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Lee Law Review).

31. *See id.* (reporting that the Mayor and Chief of Police decided that the department would focus instead on "community building").

32. *See* Shawn Musgrave, *A 'Gift' for the LAPD: Two Surveillance Drones Kicked Out of Seattle*, MOTHERBOARD (June 4, 2014), http://motherboard.vice.com/read/lapd-seattle-surveillance-drones (last visited June 16, 2015) (detailing the lead-up to the transaction including the conservations between the various agencies involved) (on file with the Washington and Lee Law Review). Other police forces have faced similar challenges to Seattle's. *See* Ashley Balcerzak & Taylor Hiegel, *Police Forces Struggle to Incorporate Drones*, THE DRONE PROJECT (Mar. 18, 2013), http://droneproject.nationalsecurityzone.org/headline-police-forces-struggle-to-incorporate-drones-ashley-balcerzak-and-taylor-hiegel/ (last visited June 16, 2015) (describing the technical, legal, and public relations issues that often occur when local police forces attempt to incorporate drones in their arsenal) (on file with the Washington and Lee Law Review).

33. *See* Terry Atlas & Greg Stohr, *Surveillance Cameras Sought by Cities After Boston Bombs*, BLOOMBERG BUS. (Apr. 29, 2013), http://www.bloomberg.com/news/articles/2013-04-29/surveillance-cameras-sought-by-cities-after-boston-bombs (last visited June 16, 2015) (explaining that Boston's Financial District employs over 200 private and public cameras, that Chicago police "have access to about 10,000" cameras, and that New York is developing a "Domain Awareness System" in addition to the approximately 3,000 cameras already in place in lower and midtown Manhattan) (on file with the Washington and Lee Law Review).

aerial surveillance,[34] radars that "see" behind walls,[35] as well as UAS.

Alternatively, under the narrow approach, if unmanned technology is deemed unique and prevalent enough, states could make it the specific and sole subject of legislation. The current efforts to do so are, on the whole, an ineffective and incomplete way of achieving that result. They are myopically focused not just on one surveillance technology—unmanned—but on only one form of that technology: aerial.

Current societal anxiety towards UAS may well be rooted in emotion, misconceptions, and biases about their use. Attempting to assuage such concerns with legislation is unlikely to be successful or effective, almost regardless of how one defines those terms or from what perspective they are considered.

This Article assumes that UAS will become prevalent and, in the process, will have fewer stigmas attached. As societal views change, so too will state legislation. Accordingly, the current state legislation regulating law enforcement UAS use is but the first round of experiments. But it is important to take stock of what state legislation would currently allow law enforcement to do with UAS. This Article examines these state labs of federalism to identify at what point, and which state UAS experiments, the Supreme Court may rule constitute a search in violation of the Fourth Amendment.[36]

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34. *See* Craig Timberg, *New Surveillance Technology Can Track Everyone in an Area for Several Hours at a Time*, WASH. POST (Feb. 5, 2014), http://www.washingtonpost.com/business/technology/new-surveillance-technology-can-track-everyone-in-an-area-for-several-hours-at-a-time/2014/02/05/82f1556e-876f-11e3-a5bd-844629433ba3_story.html (last visited June 16, 2015) (describing an aerial surveillance system used in a piloted aircraft which "can track every vehicle and person across an area the size of a small city") (on file with the Washington and Lee Law Review).

35. *See* Debra Cassens Weiss, *Feds Use Radar That Can Detect Movement in Homes; Appeals Court Raises Privacy Concerns*, A.B.A. J. (Jan. 21, 2015), http://www.abajournal.com/news/article/feds_use_radar_that_can_detect_movement_in_homes_appeals_court_raises_priva (last visited June 16, 2015) (quoting the Tenth Circuit as stating that hand-held radar devices "pos[e] grave Fourth Amendment questions") (on file with the Washington and Lee Law Review).

36. The Article does not consider UAS use as part of border searches or the special needs doctrine, though one can certainly envision those arguments for UAS use.

Part II clarifies what UAS are and details their technical capabilities.[37] Part III explains why the use of the term "drones" is, or shortly will be, problematic as UAS become increasingly more autonomous.[38] Part IV provides a short review of basic Fourth Amendment principles that apply when a court is faced with a challenge to a government search.[39] Part V explores the application of the Fourth Amendment to past forms of aerial surveillance.[40] Part VI explores its application to technological advances more broadly.[41] Part V first reviews the Supreme Court's aerial surveillance trilogy of cases and then reconsiders them in the context of UAS. Part VI conducts a similar inquiry focusing on two Supreme Court cases that deal with surveillance using sense-enhancing technology. In Part VII, the Article shifts to state efforts to regulate law enforcement UAS activities, assessing the challenges implicit in many states' efforts while drawing attention to one proposal that provides a much needed mark on the wall in terms of societal expectation for UAS surveillance.[42]

Ultimately, this Article concludes that the state approaches on the whole have been little more than reactionary pandering to the electorate.[43] But more significantly, the state approaches, with one potential exception, duck the key questions and issues surrounding societal expectations and understandings of privacy that serve as a check on governmental intrusion into our lives.

It is eminently reasonable to have concerns over how UAS technology expands law enforcement surveillance capabilities to

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37. *See infra* Part II (discussing the wide range of technical capabilities of various UAS).

38. *See infra* Part III (advocating for the use of the term "UAS," as opposed to the potentially confusing "drone").

39. *See infra* Part IV (discussing the baseline determinations that a court must make in determining if a search occurred and whether that search was reasonable).

40. *See infra* Part V (examining the Court's aerial surveillance trilogy which examined various forms of manned aerial surveillance under the Fourth Amendment).

41. *See infra* Part VI (detailing the Court's treatment of the use of advanced sensory technologies under the Fourth Amendment).

42. *See infra* Part VII (explaining how state legislative efforts have thus far failed to effectively regulate UAS use by law enforcement).

43. *See infra* Part VII (discussing ways in which state legislative efforts have had a much lower impact than their proponents may have advertised).

an extent that was previously unrealistic due to resource constraints or technological feasibility. But there is another largely unaddressed aspect to the debate. We should be able to separate out police activities that have little if anything to do with a "surveillance state." Police photograph crime scenes, search for missing people, chase down fugitives, and conduct permissible warrantless searches in open fields. We need to discuss what our societal expectations of privacy mean. In the process, we need to resolve why it is that we would not want law enforcement to conduct regular and routine actions more efficiently, more effectively, more safely—and yes—more economically.[44]

II. Unmanned Aerial Systems

The FAA has defined an unmanned aircraft as "a device that is used or intended to be used for flight in the air that has no onboard pilot. This includes all classes of airplanes, helicopters, airships and translational lift aircraft that have no onboard pilot."[45] The FAA has also designated that UAS are aircraft as defined by the Code of Federal Regulations.[46]

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44. One commentator (currently the chief technology officer at Federal Trade Commission) would use cost efficiencies as a measure of when privacy expectations have been violated. Under this approach, "if the cost of the surveillance using the new technique is an order of magnitude (ten times) less than the cost of the surveillance without using the new technique, then the new technique violates a reasonable expectation of privacy." Askhan Soltani, *The Cost of Surveillance*, ASHKAN SOLTANI (Jan. 9 2014), http://ashkansoltani.org/2014/01/09/the-cost-of-surveillance (last visited June 22, 2015) (on file with the Washington and Lee Law Review). This approach would seem to both discourage law enforcement innovation and effectiveness while providing an incentive for artificially inflated UAS pricing.

45. AVIATION SAFETY UNMANNED AIRCRAFT PROGRAM OFFICE, FED. AVIATION ADMIN., INTERIM OPERATIONAL APPROVAL GUIDANCE 8-01: UNMANNED AIRCRAFT SYSTEMS OPERATIONS IN THE U.S. NATIONAL AIRSPACE SYSTEM (2008).

46. *See* 14 C.F.R. § 1.1 (2012) (defining "aircraft" as "a device that is used or intended to be used for flight in the air"). That UAS are aircraft may seem self-evident, but in early 2014 a National Transportation Safety Board Administrative Law Judge ruled that a flyable device used by an individual to film the University of Virginia was a model aircraft and thus not subject to FAA rules. *See* Jack Nicas, *NTSB Rules Drones Are Aircraft, Subject to FAA Rules,* WALL ST. J. (Nov. 18, 2014), http://www.wsj.com/articles/ntsb-rules-drones-are-aircraft-and-subject-to-faa-rules-1416326767 (last visited June 10, 2015) (reporting on the initial ALJ ruling and the eventual revision of the policy) (on file with the Washington and

The term UAS should be thought of as very broad and encompassing a vast range of devices, ranging from the size of insects or birds,[47] to small systems which are carried in a backpack and employed by the operator tossing them in the air,[48] all the way to systems with a 130 foot wingspan.[49] The capabilities of UAS are correspondingly diverse; there are systems which can only fly for minutes at low altitude,[50] those which can fly for a day at a time and higher than commercial air traffic,[51] and everything in between.[52] Some UAS are battery powered, others use liquid fuel.[53]

Lee Law Review). In November, 2014 the NTSB overturned that ruling, noting that "[t]he plain language of the statutory and regulatory definitions is clear: an 'aircraft' is any device used for flight in the air." Huerta v. Pirker, NTSB Order No. EA-5730 at 3 (2014). The NTSB did concede that "the definitions are as broad as they are clear, but they are clear nonetheless." *Id.* at 2.

47. *See* Adam Pior, *Rise of the Insect Drone*, POPULAR SCI. (Jan. 29, 2014), http://www.popsci.com/article/technology/rise-insect-drones (last visited June 18, 2015) (reporting that "[e]ngineers have developed the first insect-inspired vehicles, opening the door to an entirely new class of machine: the microdrone") (on file with the Washington and Lee Law Review).

48. *See UAS RQ-11B Raven*, AEROVIRONMENT, INC. (2015), http://www.avinc.com/uas/small_uas/raven/ (last visited June 17, 2015) (advertising the privately developed RQ-11B Raven a hand-launched UAS "designed for rapid deployment and high mobility for military applications requiring low-altitude surveillance and reconnaissance intelligence") (on file with the Washington and Lee Law Review).

49. *See Global Hawk*, NORTHROP GRUMMAN, (2015), http://www.northropgrumman.com/capabilities/globalhawk/Pages/default.aspx (last visited June 15, 2015) [hereinafter *Global Hawk*] (detailing the Global Hawk reconnaissance UAS which has been used extensively by the U.S. military and has a 130 foot wingspan and can stay airborne for over thirty hours) (on file with the Washington and Lee Law Review).

50. *See Parrot Bebop Drone*, PARROT, http://www.parrot.com/usa/products/bebop-drone/ (last visited June 20, 2015) (advertising the "lightweight and safe" Bebop drone which can be controlled using an iPhone and has a lithium battery that allows for twenty-two minutes of flight) (on file with the Washington and Lee Law Review).

51. *See Global Hawk*, *supra* note 49 (describing a massive and correspondingly expensive UAS designed for military and intelligence use).

52. *See* Jeremy Bender, *A Complete Guide to Drones, in One Picture*, SLATE (Feb. 2, 2014), http://www.slate.com/blogs/business_insider/2014/02/02/diagram_different_types_of_drones.html (last visited June 21, 2015) (providing an illustrated guide to various types of drones used by nations around the world) (on file with the Washington and Lee Law Review).

53. *See* David Hambling, *Longer-Lasting Drones Powered by Fuel Cells*, POPULAR MECHANICS. (May 3, 2013), http://www.popularmechanics.com/military/a8956/longer-lasting-drones-powered-by-fuel-cells-15425554/ (last visited June

Regardless of power source, efforts are underway to allow mid-air recharging[54] or refueling,[55] such that a UAS might never need to land.[56] Virtually all UAS have some form of optics, cameras and other sensors by which the UAS captures images, which can be either recorded or transmitted to the operator.[57] The UAS optics generally include magnification and, on more advanced systems, infrared or thermal imaging which detect and distinguishes heat sources.[58] While this Article focuses on the aerial unmanned system, there are numerous ground[59] and aquatic[60] variants of unmanned systems. Often capable of capturing both images and

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20, 2015) (recapping some of the recent developments and improvements in the technology used to power UAS) (on file with the Washington and Lee Law Review).

54. *See* Richard White, *How it Works: Laser Beaming Recharges UAV in Flight*, POPULAR MECHANICS, (July 28, 2012), http://www.popularmechanics.com/flight/drones/a7966/how-it-works-laser-beaming-recharges-uav-in-flight-11091133/ (last visited June 19, 2015) (explaining new technological advancements which use lasers to recharge a UAS's battery and allow it to remain airborne for forty-eight hours) (on file with the Washington and Lee Law Review).

55. *See* Brian Anderson, *Oh, Great: Now Drones Can Refuel in Midair*, MOTHERBOARD (Oct. 8, 2012), http://motherboard.vice.com/blog/oh-great-now-drones-can-refuel-in-midair (last visited June 20, 2015) (reporting on a successful trial of techniques and technology that allow for one UAS to refuel another midair) (on file with the Washington and Lee Law Review).

56. *See id.* ("It's harbinger of a coming age of near endless flight and, by extension, near endless surveillance.").

57. *See, e.g.*, *Global Hawk Integrated Sensor Suite*, RAYTHEON, http://www.raytheon.com/capabilities/products/globalhawk_iss/ (last visited June 20, 2015) (describing that the Global Hawk's optical capabilities "combin[e] a cloud-penetrating synthetic aperture radar (SAR) antenna with a ground moving target indicator (GMTI), a high resolution electro-optical (EO) digital camera and an infrared (IR) sensor") (on file with the Washington and Lee Law Review).

58. *Id.*

59. *See Technology*, TRANSCEND ROBOTICS, http://www.transcendrobotics.com/ (last visited June 20, 2015) (depicting advances of ground-based unmanned systems capable of climbing stairs and assisting in construction, HAZMAT scenarios, filming, and search and rescue) (on file with the Washington and Lee Law Review).

60. Ben Coxworth, *Ziphius Takes Drone Tech to the Waves*, GIZMAG (June 28, 2013), http://www.gizmag.com/ziphius-aquatic-drone/28097 (last visited June 20, 2015) (describing unmanned aquatic system which transmits high definition video to its operator in real time) (on file with the Washington and Lee Law Review).

audio, these systems fall outside the current state legislation, which only regulates police use of unmanned aerial systems.[61]

III. Why UAS Are Not "Drones"

The term "drone" is commonly used in place of the wordy "unmanned aerial systems."[62] While understandable, the term drone risks confusion; if not now, then in the future.[63] The current conversation, and this Article, involves remotely piloted systems, meaning that a human being controls the system remotely from the ground.[64] The actions of the UAS are determined by its human operator; the UAS turns right or climbs because its operator directed those actions.[65]

The next generation of UAS, though, will not be piloted; they will be increasingly autonomous.[66] Humans will not fly or pilot these systems remotely; rather, we will direct them to fly a certain

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61. *See infra* Part VII (discussing state legislation that has been passed in recent years).

62. *See* Ben Zimmer, *The Flight of 'Drone' From Bees to Planes,* WALL ST. J. (July 26, 2013), http://www.wsj.com/articles/SB10001424127887324110404578625803736954968 (last visited June 20, 2015) (tracing the ascension of the term into common parlance) (on file with the Washington and Lee Law Review).

63. *See* Nidhi Subbaraman, *Don't Call 'em Drones: The Wide World of Unmanned Flying Machines,* NBC NEWS (Mar. 15, 2013), http://www.nbcnews.com/technology/technolog/dont-call-em-drones-wide-world-unmanned-flying-machines-1C8857699 (last visited June 20, 2015) (acknowledging the disparate group of technologies that get swept under the term "drone" and reporting criticism of the use from various corners) (on file with the Washington and Lee Law Review).

64. *Cf.* Corey Mead, *A Rare Look Inside the Air Force's Drone Training Classroom,* THE ATLANTIC (June 4, 2014), http://www.theatlantic.com/technology/archive/2014/06/a-rare-look-inside-the-air-forces-drone-training-classroom/372094/ (last visited June 20, 2015) (reporting on the training program the United States Air Force puts its UAS operators through) (on file with the Washington and Lee Law Review).

65. *See id.* (describing some of the skills that must be mastered by drone operators before controlling during live missions).

66. *See* Brian Fung, *Get Ready: The Autonomous Drones Are Coming,* THE ATLANTIC (Jan. 16, 2013), http://www.theatlantic.com/international/archive/2013/01/get-ready-the-autonomous-drones-are-coming/267246/ (last visited June 13, 2015) (addressing the technological advances and the policy issues that will be faced the technology comes into wide use) (on file with the Washington and Lee Law Review).

route.[67] Depending on the level of autonomy, the system would even take off, and, having the capability to detect other objects on the ground and in the air, fly to "point A" without human intervention or direction.[68] To this author's thinking, we should reserve the term drone for autonomous systems. While that linguistic argument is likely lost, society will probably want to distinguish between devices flying in the air at the direction of a human operator and increasingly autonomous systems which perform navigation and other functions which a human operator currently performs or directs.

For the remainder of the Article, it is useful to consider if and how the answer to a Fourth Amendment question involving UAS may or may not change, depending on the type of UAS and its capabilities. For example, a UAS with no magnification may be seen differently than surveillance using binoculars or thermal imaging that can "see" through walls or roofs. Similarly, consider how a court might distinguish between small, mobile UAS with relatively short flight time, large semi-autonomous systems that operate for several hours, and systems which can refuel or recharge mid-air and are capable of continuous surveillance of an individual for an entire month.

IV. The Fourth Amendment

Before discussing first the Supreme Court's aerial surveillance trilogy and then selected technology-based cases, it is useful to review what is at issue in Fourth Amendment cases. A court must initially determine if government efforts constitute a search or seizure of a person, their house, their papers, or their effects.[69]

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67. *See* Mike Murphy, *Truly Autonomous Drones are Coming, and They May Soon Deliver Packages to Your Door*, QUARTZ (May 15, 2015), http://qz.com/405263/truly-autonomous-drones-are-coming-and-they-may-soon-de liver-packages-to-your-door/ (last visited June 21, 2015) (describing the current level of technological advancement in the field and addressing the ways designers are pushing the limit of what these UAS can do) (on file with the Washington and Lee Law Review).

68. *See id.* (focusing on the issues related to autonomous navigation that are being work on by designers and engineers).

69. *See* U.S. CONST. amend. IV ("The right of the people to be secure *in their persons, houses, papers, and effects*, against unreasonable searches and seizures, shall not be violated . . . .") (emphasis added).

Then the court must determine if that search or seizure was unreasonable.[70] These determinations turn on the application of *Katz v. United States*,[71] a 1967 Supreme Court case which clarified that the Fourth Amendment "protects people, not places."[72] In *Katz*, the Court instructed that the "Fourth Amendment cannot be translated into a general constitutional 'right to privacy.'"[73] Through Justice Harlan's concurring opinion, *Katz* is the source of a two-part test to determine whether a reasonable expectation of privacy exists such that government intrusion would constitute a search.[74] The court must determine "whether the individual has exhibited an actual (subjective) expectation of privacy" and "whether society is prepared to recognize that expectation as reasonable."[75]

V. Manned Aircraft Surveillance

The Supreme Court's treatment of law enforcement use of manned aerial surveillance provides a useful starting point for predicting how UAS will fare under the Fourth Amendment. Three cases, *California v. Ciraolo*,[76] *Florida v. Riley*,[77] and *Dow Chemical Co. v. United States*,[78] comprise what one commentator referred to

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70. *See id.* (guaranteeing protection against "*unreasonable* searches and seizures") (emphasis added).

71. 389 U.S. 347 (1967).

72. *Id.* at 351.

73. *Id.* at 350.

74. *See* Katz v. United States, 389 U.S. 347, 361 (1967) (Harlan, J. concurring) ("My understanding of the rule that has emerged from prior decisions is that there is a twofold requirement, first that a person have exhibited an actual (subjective) expectation of privacy and, second, that the expectation be one that society is prepared to recognize as 'reasonable.'").

75. *See* Smith v. Maryland, 442 U.S. 735, 740 (1979) (accepting Harlan's formulation as the proper test to determine reasonable expectations of privacy).

76. 476 U.S. 207 (1986). *See generally* Laura L. Krakovec, *Fourth Amendment—Constitutionality of Warrantless Aerial Surveillance: California v. Ciraolo, 106 S. Ct. 1809 (1986)*, 77 J. CRIM. L. & CRIMINOLOGY 602 (1986) (providing an in-depth analysis of the case, the Court's decision, and its possible impact).

77. 488 U.S. 445 (1989).

78. 476 U.S. 227 (1986).

as the "aerial surveillance trilogy."[79] This trilogy provides the base of the analytical framework upon which two significant technology based cases will later be added.[80]

A. California v. Ciraolo

In 1982, Santa Clara, California police received an anonymous tip that Dante Ciraolo was growing marijuana in his backyard.[81] The contents of Ciraolo's backyard were not visible from the street due to a six foot outer fence and a ten foot inner fence.[82] As a result, two Santa Clara police officers used a private plane to fly over Ciraolo's house "at an altitude of 1000 feet, within navigable airspace."[83] The officers, who had been trained in marijuana detection, observed marijuana plants growing in the yard and "photographed the area with a standard 35mm camera."[84]

Based on the anonymous tip and their fly-over observations and photographs, the police obtained a search warrant and seized seventy-three marijuana plants from Ciraolo's backyard.[85] The trial court denied Ciraolo's motion to suppress, which the California Court of Appeals reversed on the grounds that that the aerial observation constituted a warrantless search in violation of the Fourth Amendment.[86]

The Supreme Court reversed the California Court of Appeals and determined that Ciraolo's "expectation that his garden was protected from [aerial observation] is unreasonable, and is not an

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79. *See* 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, 681 (2009) ("The Court's holdings form an 'aerial surveillance trilogy' and the basis for aerial surveillance Fourth Amendment law.").

80. *See id.* (contending that *Ciraolo*, *Riley*, and *Dow* are the starting point for any future analysis of aerial law enforcement surveillance under the Fourth Amendment).

81. *See* California v. Ciraolo, 476 U.S. 207, 209 (1986) (recounting the facts that lead to Ciraolo's prosecution).

82. *Id.*

83. *Id.*

84. *Id.*

85. *Id.* at 209–10.

86. *Id.* at 210.

expectation that society is prepared to honor."[87] The Court reviewed and applied the two-part inquiry under *Katz* and its progeny to determine whether Ciraolo had a constitutionally protected reasonable expectation of privacy in his backyard garden: "[F]irst, has the individual manifested a subjective expectation of privacy in the object of the challenged search? Second, is society willing to recognize that expectation as reasonable?"[88]

In erecting two different fences, there was no question that Ciraolo had taken precaution to maintain his privacy and in so doing manifested his subjective expectation of privacy.[89] But the Court found his expectation societally unreasonable.[90]

There was no dispute that Ciraolo's backyard was considered in the curtilage of his home.[91] The Court noted that "[a]t common law, the curtilage is the area to which extends the intimate activity associated with the sanctity of a man's home and the privacies of life."[92] Moreover, the Court noted that "[t]he protection afforded the curtilage is essentially a protection of families and personal privacy in an area intimately linked to the home, both physically and psychologically, where privacy expectations are most heightened."[93]

But the Court quickly added

> [t]hat the area is within the curtilage does not itself bar all police observations. The Fourth Amendment protection of the home has never been extended to require law enforcement officers to shield their eyes when passing by a home on public thoroughfares. Nor does the mere fact that an individual has taken measures to restrict some views of his activities preclude an officer's observations from a public vantage point where he

87. *Id.* at 214.

88. *Id.* at 211 (citing Smith v. Maryland, 442 U.S. 735, 740 (1979)).

89. *See id.* ("Clearly—and understandably—respondent has met the test of manifesting his own subjective intent and desire to maintain privacy as to his unlawful agricultural pursuits.").

90. *See id.* at 215 (rejecting Ciraolo's expectation as one society is prepared to recognize).

91. *See id.* at 213 (recounting the history and definition of curtilage and accepting that Ciraolo's marijuana plants were within that space).

92. *Id.* at 212 (internal quotations omitted).

93. *Id.* at 213.

> has a right to be and which renders the activities clearly visible.[94]

The Court noted that "[a]ny member of the public flying in this airspace who glanced down could have seen everything that these officers observed."[95] Quoting *Katz*, the Court reiterated that "[w]hat a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection."[96] The opinion's penultimate sentence frames the ruling's qualifications: "[I]n an age where private and commercial flight in the public airways is routine, it is unreasonable for [Ciraolo] to expect that his marijuana plants were constitutional protected from being observed with the naked eye from an altitude of 1,000 feet." [97]

The significance of the "naked eye" concept will be discussed later in Part VI. The altitude in this case was important for two reasons. First, at 1,000 feet, the police observed Ciraolo's backyard "in a physically nonintrusive manner."[98] Second, flying at 1,000 feet placed the police within public navigable airspace.[99]

The significance of the surveillance occurring within public navigable airspace was tested three years later in *Florida v. Riley*,[100] where the Court had the opportunity to consider lower altitude and a different aerial surveillance platform.

B. Florida v. Riley

The facts in *Florida v. Riley* are exceedingly similar to those in *Ciraolo*. Following an anonymous tip that Riley was growing marijuana in a greenhouse behind his residence and being unable to observe the inside of the greenhouse, a Florida county Sherriff's office took to the skies.[101] Instead of the fixed wing plane the police in *Ciraolo* flew at an altitude of 1,000 feet, in *Riley,* the police were

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94. *Id.*
95. *Id.* at 213–14.
96. *Id.* at 213.
97. *Id.* at 215.
98. *Id.* at 213.
99. *Id.* (citation omitted).
100. 488 U.S. 445 (1989).
101. *See id.* at 448 (describing the facts of the case).

in a helicopter and flew at 400 feet.[102] As in *Ciraolo*, the airborne law enforcement officer used his naked eye to observe someone's backyard.[103] Through openings in the side and roof of the greenhouse, police observed what appeared to be marijuana. Officers obtained a warrant, and the resulting physical search of the greenhouse revealed just that.[104] A Florida trial court granted Riley's motion to suppress, the Florida Court of Appeals reversed the trial court, and the Florida Supreme Court in turn quashed the Court of Appeals's decision and reinstated the trial court's suppression order.[105] In a plurality opinion, the Supreme Court largely repeated its *Ciraolo* analysis and found that the 400-foot aerial surveillance of Riley's greenhouse did not violate the Fourth Amendment.[106] While the FAA's altitude for fixed wing aircraft is 500 feet, helicopters may permissibly operate at a lower altitude so long as operation is "without hazard to persons or property on the surface."[107] The Court noted that the surveillance at issue did not cause undue noise, wind, dust, or otherwise interfere with Riley's normal use of the greenhouse.[108] However, the Supreme Court claimed that it "would have a different case if flying at [400 feet] had been contrary to law or regulation."[109]

Returning to a *Ciraolo* type analysis, the Court claimed that "[a]ny member of the public could legally have been flying over Riley's property in a helicopter at an altitude of 400 feet and could have observed Riley's greenhouse. The police officer did no more."[110]

The Court unsuccessfully tried to claim a boundary on such searches, saying, "This is not to say that an inspection of the curtilage of a house from an aircraft will always pass muster under the Fourth Amendment simply because the plane is within

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102. *Id.*

103. *Id.*

104. *Id.* at 449.

105. *See id.* at 449 (relating the procedural history of the case).

106. *See id.* at 451–52 (announcing the Court's holding).

107. *See id.* at 451 n.3 (describing and applying the rule set forth in 14 C.F.R. § 91.79).

108. *See id.* at 452 (noting that the record showed no physical interference with Riley's property rights).

109. *Id.* at 451.

110. *Id.*

navigable airspace as defined by law."[111] Yet the Court held that the fact the helicopter was within navigable airspace was "of obvious importance" and claimed that "there is nothing in the record or before us to suggest that helicopters flying at 400 feet are sufficiently rare in this country to lend substance to [Riley's] claim he reasonably anticipated that his greenhouse would not be subject to observation from that altitude."[112] While the Court made no effort to quantify what number of flights below 400 feet had occurred such that they were not "sufficiently rare," in a footnote, the Court instructed that "every State in the country uses helicopters in police work. As of 1980, there were 1,500 such aircraft used in police work. More than 10,000 helicopters, both public and private are registered in the United States."[113]

Justice O'Connor's concurring opinion raises questions about the majority's analysis in *Riley* and, when read in conjunction with the technology cases discussed in Part VI, offers insight into how police drone surveillance cases may be decided in the future.[114] O'Connor argued that the "plurality's approach rests the scope of the Fourth Amendment too heavily on compliance with FAA regulations whose purpose is to promote air safety, not to protect "[t]he right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures."[115]

Justice O'Connor further took issue with the plurality test of whether the public could legally have been at the same altitude and location as the police conducting aerial surveillance.[116] She contended that

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111. *Id.*

112. *Id.* at 451–52.

113. *Id.* at 450 n.2 (internal citations omitted).

114. *See* J. Tyler Black, Note, *Over Your Head, Under the Radar: An Examination of Changing Legislation, Aging Case Law, and Possible Solutions to the Domestic Drone Puzzle*, 70 WASH. & LEE L. REV. 1829, 1830 (2013) (predicting that "[t]he drone revolution promises to increase substantially the ability of law enforcement to serve and protect their jurisdictions").

115. Florida v. Riley, 488 U.S. 445, 452 (1989) (O'Connor, J., concurring).

116. *See id.* at 452 (1989) (O'Connor, J., concurring) ("In my view, the plurality's approach rests the scope of the Fourth Amendment too heavily on compliance with FAA regulations whose purpose is to promote air safety, not to protect [Fourth Amendment rights].").

> [i]f the public rarely, if ever, travels overhead at such altitudes, the observation cannot be said to be from a vantage point generally used by the public and Riley cannot be said to have 'knowingly expose[d]' his greenhouse to public view. However if the public can generally be expected to travel over residential backyards at an altitude of 400 feet, Riley cannot reasonably expect his curtilage to be free from such aerial observation.[117]

Having distinguished between fixed and rotary wing naked eye surveillance at 1,000 and 400 feet respectively, the final case in the trilogy presented two variants: commercial, not residential property, and the use of enhanced aerial surveillance equipment.

C. Dow Chemical Co. v. United States

In the same year as *Ciraolo*, the Supreme Court also decided *Dow Chemical Co. v. United States*.[118] Dow operated a massive 2,000-acre chemical manufacturing facility in Michigan.[119] After Dow refused the Environmental Protection Agency's (EPA) request to conduct a site inspection, the EPA took to the sky.[120] Flying at altitudes of 1,200, 3,000, and 12,000 feet, a commercial aerial photographer employed by the EPA used a standard but precise aerial mapping camera.[121] Dow sought to enjoin the EPA from future aerial surveillance and filed suit in United States District Court for the Eastern District of Michigan.[122] The District Court held that the surveillance constituted a search and that it had violated Dow's reasonable expectation of privacy.[123] The Sixth Circuit reversed, finding that while Dow had a subjective expectation of privacy from ground intrusion, it had manifested no such expectation in terms of aerial surveillance.[124] The Court of

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117. *Id.* at 455.

118. 476 U.S. 227 (1986).

119. *See id.* at 229 (describing the facts of the case).

120. *Id.*

121. *Id.*

122. *See id.* at 230 (describing the procedural posture of the case).

123. *See id.* (describing that the district court "found that Dow had manifested an expectation of privacy in its exposed plant areas because it intentionally surrounded them with buildings and other enclosures").

124. *See id.* (explaining that the appeals court argued that taking such precautions were feasible).

Appeals distinguished between Dow's lack of precautions against aerial surveillance and its "elaborate ground-level precautions."[125]

The Supreme Court first addressed how to consider a large industrial complex under the Fourth Amendment.[126] One option was that the complex was an "open field," meaning it was not including under the Fourth Amendment's protection of "persons, houses, papers and effects."[127] Another option, advocated by Dow, was that the plant was "industrial curtilage" and was thus covered by the Fourth Amendment.[128]

The Court concluded that the facility "can perhaps best be seen as seen as falling somewhere between 'open fields' and curtilage, but lacking some of the critical characteristics of both."[129] In terms of the Constitutional protections afforded this intermediate status, the Court acknowledged that "the businessman, like the occupant of a residence, has a constitutional right to go about his property free from unreasonable official entries upon his private commercial property."[130] Yet here, the concern is "aerial observation of a 2,000-acre outdoor manufacturing facility *without* physical entry."[131] And the Court recognized that "the government has 'greater latitude to conduct warrantless inspections of commercial property' because 'the expectations of privacy that the owner of commercial property enjoys in such property differs significantly from the sanctity accorded an individual home.'"[132] Similar to the analysis in *Ciraolo*

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125. *Id.*

126. *See id.* at 235 (addressing the Fourth Amendment claims brought by Dow Chemical Co.).

127. U.S. CONST. amend IV; *see also* Oliver v. United States, 466 U.S. 170, 184 (1984) (reiterating that open fields do not fall within the specifically protected categories of the Fourth Amendment and are thus government intrusion into them is not unreasonable).

128. *See* Dow Chem. Co. v. United States, 476 U.S. 227, 235 (1986) (relating Dow's argument that the aerial photography of the plant violated the company's reasonable expectation of privacy in that constitutionally protected space); *see also* Marshall v. Barlow's, Inc., 436 U.S. 307, 311 (1978) ("The Warrant Clause of the Fourth Amendment protects commercial buildings as well as private homes.").

129. *Id.* at 236.

130. *Dow*, 476 U.S. at 237 (quoting See v. City of Seattle, 387 U.S. 541, 543 (1967)).

131. *Id.* (emphasis in original).

132. *Id.* at 237–38 (quoting Donovan v. Dewey, 452 U.S. 594, 599 (1981)).

and *Riley*, the Court stated that "what is observable by the public is observable without a warrant, by the Government inspector as well."[133]

On the issue of the magnified nature of the surveillance, the Court claimed that the "EPA was not employing some unique sensory device that, for example, could penetrate the walls of buildings and record conversations in Dow's plants, offices or laboratories, but rather a conventional, albeit precise, commercial camera commonly used in mapmaking."[134] The District Court had labeled the surveillance equipment "the finest precision aerial camera available" and that it allowed the EPA to photograph "a great deal more than the human eye could ever see."[135] However, the Supreme Court qualified Dow's contention that "simple magnification permits identification of objects such as wires as small as ½ inch in diameter."[136] The Court claimed that the wires, power lines really,

> are observable only because of their stark contrast with the snow-white background. No objects as small as ½ inch in diameter such as a class ring, for example, are recognizable, nor are there any identifiable human faces or secret documents captured in such a fashion as to implicate more serious privacy concerns. Fourth Amendment cases must be decided on the facts of each case, not by extravagant generalizations.[137]

Finally, in a harbinger of things to come in the technology line of cases, the Court focused on the surveillance equipment being generally available to the public and the corresponding pictures being

> not so revealing of intimate details as to raise constitutional concerns. Although [the images] undoubtedly give EPA more detailed information than naked-eye views, they remain limited to an outline of the facilities buildings and equipment. The mere fact that human vision is enhanced somewhat, at least to the degree here, does not give rise to constitutional problems.[138]

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133. *Id.* at 238 (quoting Marshall v. Barlow's, Inc., 436 U.S. 307, 315 (1978)).
134. *Id.*
135. *Id.* at 235.
136. *Id.* at 238.
137. *Id.* at 238 n.5.
138. *Id.* at 238.

VI. Applying the Surveillance Trilogy to UAS

Looking only at the manned aerial surveillance cases, several aspects stand out in identifying how the Court may rule when such surveillance is unmanned. The first is Justice O'Connor's point on the problems linking constitutionality to FAA regulations.[139] Under the FAA's UAS rules, operating a UAS at less than 500 feet and within the line of sight of the operator is permissible in the same way that flying the helicopter at 400 feet in *Riley* or the plane at 1,000 feet in *Ciraolo* was.[140]

The second point is how the Court formulated whether the presence of manned aircraft was "sufficiently rare" to justify an expectation that one's property would not be under aerial surveillance.[141] Recall that the Court considered two factors: 1) that the public could have been in the same point in the public airspace as was law enforcement; and 2) that some 1,500 police helicopters operating in the U.S. meant their use was not rare.[142] The UAS-using public will indeed be able to be at the same point in the public airspace as the police, and there will be far more UAS than helicopters. As previously referenced, by 2018 the FAA estimates there will some 7,500 UAS in the UAS, four times the number of helicopters the Supreme Court used to justify a finding that aerial surveillance was not sufficiently rare.[143]

In terms of law enforcement's ability to use UAS with enhanced cameras or to loiter over one location for an extended period of time, two subsequent technology-based surveillance opinions from the Supreme Court build on the analytic framework.

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139. *See* Florida v. Riley, 488 U.S. 445, 452 (1989) (O'Connor, J., concurring) ("In my view, the plurality's approach rests the scope of the Fourth Amendment too heavily on compliance with FAA regulations whose purpose is to promote air safety, not to protect [Fourth Amendment rights].").

140. *See id.* at 451 n.3 (describing and applying the regulations set forth in 14 CFR § 91.79).

141. *See id.* at 451 (contending that there was no evidence that helicopters "flying at 400 feet are sufficiently rare in this country to lend substance to respondent's claim that he reasonably anticipated that his greenhouse would not be subject to observation from that altitude").

142. *Id.*

143. *See supra* note 15 and accompanying text (discussing predictions regarding UAS use in the near future).

A. Technology Cases

1. Kyllo v. United States

Fifteen years passed before the Supreme Court returned to the unanswered question from *Dow* about the permissible level of technological enhancement or advancement in government surveillance of the home. In *Kyllo v. United States*,[144] an agent with the Department of Interior (DOI) suspected marijuana was being grown in Danny Kyllo's Oregon house, based on an informant's tip.[145] While parked across the street, the agent used a handheld thermal imager to detect the amount of infrared radiation, or heat, emanating from Kyllo's house.[146] The garage emanated significantly more heat than either the rest of his or neighbors' homes.[147] The abnormal heat levels were significant because "indoor marijuana growth typically requires high-intensity lamps."[148] The agent, relying on the thermal imaging results, Kyllo's utility bills, and the informant's tip secured a warrant.[149] In executing the warrant, agents found and seized "an indoor growing operation involving more than 100 plants" from Kyllo's house.[150] Kyllo unsuccessfully sought to suppress the evidence seized from his house.[151] While procedurally complicated, ultimately both the trial court and the Ninth Circuit, applying *Ciraolo* and *Dow,* upheld the validity of the warrant, which relied upon the thermal imaging.[152]

Initially, the Court observed that the "right of a man to retreat into his own home and there be free from unreasonable governmental intrusion" is "at the very core of the Fourth

144. 533 U.S. 27 (2001).

145. *See id.* at 29 (reciting the facts that led to Kyllo's prosecution).

146. *See id.* (explaining that indoor marijuana growing operations often use heat lamps which emit heat signatures that can be observed with a thermal imager).

147. *See id.* at 30 (describing the information gained from the thermal scan).

148. *Id.* at 29.

149. *See id.* at 30 (describing the investigation that preceding the case).

150. *Id.*

151. *See id.* (noting the procedural history of the case).

152. *See id.* at 30–31 (describing the holdings and rationales adopted by the lower courts).

Amendment," and that "[w]ith few exceptions the question whether a warrantless search of a home is reasonable and hence constitutional must be answered no."[153]

But as the Supreme Court noted, presumably with some chagrin, the inquiry in *Kyllo* involved "assessing when a search is not a search . . . ."[154] Quoting *Ciraolo*, the *Kyllo* Court reiterated that "a Fourth Amendment search does occur—even when the explicitly protected location of a *house* is concerned—unless 'the individual manifested a subjective expectation of privacy in the object of the challenged search,'" and "society [is] willing to recognize that expectation as reasonable.'"[155]

While the DOI agent was on a public street when conducting the surveillance, in using the thermal imager, he engaged in "more than naked-eye surveillance of a home."[156] The Court distinguished this surveillance from *Dow*'s based on the heightened privacy expectations of an area adjacent to a home, like Kyllo's garage, compared to the industrial areas photographed in *Dow*.[157]

The Court acknowledged the lower court findings that the thermal imager was a "non-intrusive device which emits no rays or beams and shows a crude visual image of the heat being radiated from the outside of the house," that it "cannot penetrate walls or windows to reveal conversations or human activities," and that the specific images collected "did not show any people or activity."[158] Yet, the Court rejected the government's attempt to distinguish the thermal imaging as "off the wall" not "through the wall surveillance" as a mechanical interpretation of the Fourth Amendment.[159] To the majority, the end result of the government's approach would be to "leave the homeowner at the mercy of advancing technology—including imaging technology that could discern all human activity in the home."[160]

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153. *Id.* at 31 (internal quotation marks omitted).

154. *Id.* at 32.

155. *Id.* at 33 (quoting California v. Ciraolo 476 U.S. 207, 211 (1986)) (emphasis in original).

156. *Id.*

157. *See id.* (noting that *Dow* explicitly found its industrial areas to have a lower expectation of privacy than areas adjacent to a home).

158. *Id.* at 30.

159. *Id.* at 35.

160. *Id.*

The government also argued that the thermal imaging was not a search under *Dow* because it did not "detect private activities occurring in private areas."[161] Here, the Court was unequivocal that "[t]he Fourth Amendment's protection of the home has never been tied to measurement of the quality or quantity of information obtained" and that "any physical invasion of the home 'by even a fraction of an inch' was too much."[162]

The government also attempted to leverage a section from the *Ciraolo* opinion that aerial surveillance would become invasive if "modern technology revealed those intimate associations, objects or activities otherwise imperceptible to police or fellow citizens."[163] While the government was apparently focused on the argument that the thermal imaging did not reveal intimate associations, the *Kyllo* Court labeled the language from *Ciraolo* as "second-hand dicta" whose focus was "not upon intimacy but upon otherwise-imperceptibility, which is precisely the principle we vindicate today."[164] The majority was clear that "[i]n the home, our cases show, all details are intimate details, because the entire area is held safe from prying government eyes."[165]

The Court's holding in *Kyllo* was that "[o]btaining by sense-enhancing technology any information regarding the interior of the home that could not otherwise have been obtained without 'physical intrusion into a constitutionally protected area' constitutes a search—at least where, (as here) the technology in question is not in general public use."[166] The majority recognized that linking the constitutionality or lack thereof to whether

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161. *Id.* at 37.

162. *Id.* (quoting Silverman v. United States, 364 U.S. 505, 512 (1961)).

163. *Id.* at 38 n.5.

164. *Id.*

165. *Id.* at 37. The majority went on to explain the impractical nature of a test based on whether the information the government obtained through surveillance of the home was of "intimate details." Among other reasons such a test would be unworkable (in addition to as the majority held "wrong in principle"), the government would need to evaluate the collected information in advance, something that could only be done after the surveillance was complete. *See id.* at 39 ("And even when (if ever) that jurisprudence were fully developed, no police officer would be able to know *in advance* whether his through-the-wall surveillance picks up "intimate" details—and thus would be unable to know in advance whether it is constitutional.").

166. *Id.* (internal citations omitted).

technology was in general public use was, as the dissent argued, "inject[ing] potential uncertainty into the Constitutional analysis . . . ."[167] But the majority claimed, "That quarrel, however, is not with us but this Court's precedent."[168] The majority then ducked the issue(s) it both created and recognized with the "general public use" predicate. The Court quoted *Ciraolo* and added that "[g]iven that we can quite confidently say that thermal imaging is not 'routine' we decline in this case to reexamine that factor."[169]

2. United States v. Jones

Over a decade passed before the Supreme Court dealt with another technological advancement, continuous global positioning system (GPS) surveillance, in *United States v. Jones*.[170] Suspecting Antoine Jones of narcotics trafficking, District of Columbia police and the Federal Bureau of Investigation applied for and received a warrant to install a GPS tracking device on Jones' car.[171] Specifically, the warrant authorized the installation of the device within ten days and in the District of Columbia.[172] Eleven days after the warrant was issued, law enforcement agents attached the device to Jones' car while it was parked in a public parking lot in Maryland, not D.C.[173] For the next twenty-eight days, the government tracked the vehicle's movements. With the assistance of multiple satellites, "the device established the vehicle's location with 50 to 100 feet, and communicated that location by cellular phone to a government computer. It relayed more than 2,000 pages of data over the 4-week period."[174]

This data, along with other information, led authorities to charge Jones and several others with many drug-related criminal

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167. *Id.* at 39 n.6.
168. *Id.*
169. *Id.*
170. 132 S. Ct. 945 (2012).
171. *See id.* at 948 (reciting the facts of the case).
172. *See id.* (describing the warrant that was issued).
173. *Id.*
174. *Id.*

violations.[175] Jones sought to suppress the evidence obtained via the GPS tracker.[176] The District Court granted his motion in part, suppressing the location data obtained while Jones' car was parked in his garage, which adjoined his house.[177] The District Court's rationale was that the remaining location data was admissible because "[a] person traveling in an automobile on public thoroughfares has no reasonable expectation of privacy in his movements from one place to another."[178] The Court of Appeals for the District of Columbia later reversed Jones' conviction because of the warrantless use of the GPS tracker.[179]

Justice Scalia authored the *Jones* opinion, which starts out in a straightforward manner, holding that the government, in placing the tracking device on Jones' car, "physically occupied private property."[180] That action alone constituted a search, as did the subsequent use of the device to monitor the vehicle's location.[181] But through concurring opinions by Justice Alito (joined by three justices) and by Justice Sotomayor, arguably there are two majority opinions; Scalia's opinion of the Court and the combination of the two concurring opinions, which garnered five justices' support.

The issue that divided the Court was to what extent and how the original intent of Fourth Amendment protections applies today. To the majority, eighteenth century guarantees against unreasonable searches "must provide *at a minimum* the degree of

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175. *See id.* ("The Government ultimately obtained a multiple-count indictment charging Jones and several alleged co-conspirators with, as relevant here, conspiracy to distribute and possess with intent to distribute five kilograms or more of cocaine and 50 grams or more of cocaine base, in violation of 21 U.S.C. §§ 841 and 846.").

176. *Id.*

177. *See id.* (relating the procedural history that led to the casing coming before the Supreme Court).

178. *Id.* (quoting United States v. Knotts, 460 U.S. 276, 281 (1983)).

179. *See id.* at 949 (explaining that the appellate court found that the government actions violated the Fourth Amendment and refused an *en banc* hearing of the case).

180. *Id.* at 949.

181. *See id.* ("We have no doubt that such a physical intrusion would have been considered a "search" within the meaning of the Fourth Amendment when it was adopted.").

protection [they] afforded when it was adopted."[182] Under this approach, basic trespass concepts seem to make *Jones* an easy decision for the majority, though Justice Alito calls the inquiry into question.[183] But under the majority's view, the government occupied Jones' property outside the scope and terms of the warrant.[184] Under that formulation, one need not reach whether Jones had a reasonable expectation of privacy under *Katz*.[185]

The majority recognized that continuous surveillance without an accompanying trespass would raise a difficult constitutional question.[186] The majority noted that such circumstances may amount to an "unconstitutional invasion of privacy, but the present case does not require us to answer that question."[187] But the majority added that "situations involving merely the transmission of electronic signals without trespass would *remain* subject to Katz analysis."[188]

In a sense, the majority opinion looked retrospectively and addressed the case and facts presented, while the concurring opinions looked prospectively at what is inevitably heading the Courts way: technologically-enabled unmanned surveillance without a trespass through law enforcement UAS.

Justice Sotomayor's concurrence contended that "[i]n cases of other novel modes of surveillance that do not depend on a physical invasion on property, the majority's trespassory test may provide little guidance."[189] She then explained how GPS tracking data "generates a precise, comprehensive record of a person's public movements that reflects a wealth of detail about her familiar,

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182. *Id.* at 953.

183. *See* United States v. Jones 132 S. Ct. 945, 958 (2012) (Alito, J. concurring) (criticizing the majority's approach as "unwise" and stating that "it strains the language of the Fourth Amendment; it has little if any support in current Fourth Amendment case law; and it is highly artificial").

184. *See id.* at 948 (explaining that police failed to comply with the warrant's directives in regard to time and geographic location).

185. *See id.* at 950 (stating that "we need not address the Government's contentions, because Jones's Fourth Amendment rights do not rise or fall with the *Katz* formulation").

186. *See id.* at 954 (responding to the concurrences' focus on the expectation of privacy implications of the surveillance of Jones).

187. *Id.*

188. *Id.* at 953.

189. *Id.* at 955 (Sotomayor, J., concurring).

political, professional, religious and sexual associations."[190] And the result, according to Justice Sotomayor is that "[a]wareness that the Government may be watching chills associational and expressive freedoms" and ultimately "alter[s] the relationship between citizen and government in a way that is inimical to democratic society."[191]

Justice Alito contended that the majority holding was "unwise. It strains the language of the Fourth Amendment; it has little if any support in current Fourth Amendment case law; and it is highly artificial."[192] Justice Alito highlighted how the majority "makes very little effort to explain how the attachment or use of the GPS device" constituted an unreasonable search.[193] He then disaggregated the installation of the device from the use, claiming that it could only be the use which constitutes a search.[194]

In explaining why the Court should have "ask[ed] whether [Jones'] reasonable expectations or privacy were violated by the long term monitoring of the movements of the vehicle he drove," Justice Alito argued that the majority's focus is backwards.[195] This is because, in Alito's view,

> the Court's reasoning largely disregards what is really important (the *use* of the a GPS for the purpose of long-term tracking) and instead attaches great significance to something that most would view as relatively minor (attaching to the bottom of a car a small, light object that does not in any way interfere with the car's operation).[196]

Clearly Justice Alito, while critiquing the majority's reasoning in *Jones*, was concerned about how the Court will address the inevitable, long-term government surveillance which does not involve a physical trespass.[197] He listed a host of devices which

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190. *Id.*

191. *Id.* at 956 (quoting United States v. Cuevas-Perez, 640 F.3d 272, 285 (7th Cir. 2011) (Flaum, J. concurring)).

192. *Id.* at 958 (Alito, J., concurring).

193. *Id.*

194. *See id.* ("It is clear that the attachment of the GPS device was not itself a search; if the device had not functioned or if the officers had not used it, no information would have been obtained.").

195. *Id.* at 958.

196. *Id.* at 961 (emphasis in original).

197. *See id* at 961–63 (discussing developments in technology which allow for

monitor a person's movements: closed-circuit television, automatic roadway tolls, roadside assistance services, and the ubiquitous nature of cell phones and other wireless devices.[198] To that list we can of course add UAS.

To Alito and three other Justices, "[S]ociety's expectation has been that law enforcement agents and others would not—and indeed, in the main, simply could not—secretly monitor and catalog every single movement of an individual's car for a very long period."[199] At the time *Jones* was decided, however, the technology made "long term monitoring relatively easy and cheap."[200] Justice Alito claimed an inability to "identify with precision the point at which the tracking of this vehicle became a search, for the line was *surely crossed before the 4-week mark.*"[201]

B. Applying the Technology Cases to UAS

While there have been additional decisions which inform the Supreme Court's views on technology and surveillance in

law enforcement to implement comprehensive levels of surveillance which would have previously been constrained by practical limitations such as manpower).

198. *See id.* at 963 ("The availability and use of these and other new devices will continue to shape the average person's expectations about the privacy of his or her daily movements.").

199. *Id.* at 964. Law enforcement agents could have placed Jones under human surveillance for the 28 days, staking out his residence and work place when he was there and following him when he drove. And such surveillance would presumably have yielded the same information as that provided by the GPS device. But as Justice Alito notes, such surveillance would have been "difficult and costly and therefore rarely undertaken." *Id.* at 963.

200. *Id.* at 964 (Alito, J., concurring).

201. *Id.* (emphasis added).

criminal[202] and civil contexts,[203] *Kyllo* and *Jones* provide crucial, additional clues to those offered by the surveillance trilogy cases. First, under *Kyllo* it would seem that law enforcement could not utilize UAS equipped with thermal sensors akin to those in *Kyllo*, which allow for capturing images and information otherwise not available without a physical intrusion.[204] The one caveat is that the Court conditioned its ruling on such technology not being generally available.[205] Some may argue that the same reasoning would

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202. One such decision is *Florida v. Jardines*, 133 S. Ct. 1409 (2013), decided a little more than a year after *Jones*. *Jardines* dealt with police use of a dog trained to detect narcotics on Jardines' porch. *Id.* at 1413. Justice Scalia authored the majority opinion and based the opinion on property aspects; specifically, that police (and their dog) physically intruded on Jardines' home. *Id.* at 1417. Justice Kagan stated in a concurring opinion that she "could just as happily have decided [the case] by looking to Jardines' privacy interests." *Id.* at 1418. Justice Alito's dissent, which three justices joined, claimed both were incorrect. *See id.* at 1420–22 (arguing that trespass law did not support the Court's opinion and that there was no reasonable privacy interest because is customary for members of the public to approach private homes from the driveway). While *Jardines*' various opinions reference *Katz* and *Kyllo*, among other cases, *Jardines* does not provide much insight beyond what was previously known: Justice Scalia looks to property or trespass issues where possible while Justice Alito disagrees with the property-based approach.

203. In *Grady v. North Carolina*, 135 S. Ct. 1368 (2015), the Supreme Court addressed GPS monitoring of a sexual offender for the duration of his natural life. The Court applied *Jones*, holding that a State "conducts a search when it attaches a device to a person's body, without consent, for the purpose of tracking that individual's movements." *Id.* at 1370. A notable aspect of *Grady* is that North Carolina's sexual offender monitoring program was civil in nature but still fell within the ambit of the Fourth Amendment. *See id.* at 1371 (noting that it is well settled that Fourth Amendment protections extend beyond criminal investigations). The North Carolina Court of Appeals had relied on the monitoring program's civil nature to determine its use did not constitute a search. *See id.* ("[T]he North Carolina Court of Appeals apparently placed decisive weight on the fact that the State's monitoring program is civil in nature."). The Supreme Court found that the monitoring did constitute a search. *See id.* (finding that the State's program was designed to obtain information by physically intruding on a subject's body). The Court stated that whether or not the monitoring was unconstitutional depended on whether the search was unreasonable. *See id.* ("The Fourth Amendment prohibits only *unreasonable* searches."). Because there was nothing in the record regarding the reasonableness of the search, the Court vacated the Court of Appeal's ruling and remanded the case for further proceedings. *See id.* (noting that the state courts had not examined whether the search was reasonable).

204. *See supra* notes 167–170 and accompanying text (discussing the Court's holding in *Kyllo*).

205. *See supra* note 168 and accompanying text (discussing the significance of

prompt a different outcome in *Kyllo* if considered today due to the general availability of heat sensors. Such a result would eviscerate the Fourth Amendment. The Supreme Court will, or at least should, clarify the role of general availability and presumptive, as opposed to actual use as they relate to privacy expectations. Yet presumably, what the Court is really saying in *Kyllo*[206] is that unless and until society accepts as a behavioral norm the looking or sensing through the walls of others' homes—an unlikely event—the interior of the home will remain entitled to protection from government surveillance to obtain information which could otherwise be obtained only by a physical intrusion.[207]

Second, *Jones* at least partially answers the question of whether law enforcement could employ a UAS to continuously conduct surveillance over a person, place, or object.[208] Per Justice Alito and three other justices, we know that within twenty-eight days such continuous warrantless surveillance would constitute a search.[209] Given that current UAS are piloted from the ground, such continuous surveillance seems unlikely for the same reasons that it was unlikely that police officers would have chosen to physically follow Jones around.[210] We can probably expect to see more continuous UAS use when the systems become autonomous, and could be programmed to loiter over a house, or follow a car. This Part's consideration of the aircraft surveillance trilogy and selected technology cases provides a sufficient framework to consider states' ongoing efforts to allow but regulate law enforcement UAS use.

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the fact that the thermal sensors used in *Kyllo* were not generally available).

206. The Court in *Kyllo* was also trying to square the circle it created with the general availability concept in the aerial surveillance trilogy.

207. *See supra* note 164 and accompanying text (discussing language in *Kyllo* regarding important privacy interests inside the home). Whether or not Justice Scalia will argue "constructive trespass" in accord with his property/trespass view remains to be seen.

208. *See supra* notes 182–187 and accompanying text (discussing the majority opinion in *Jones*).

209. *See supra* note 181 and accompanying text (discussing Alito's concurring opinion in *Jones*).

210. *Id.*

VII. State Experiments

As discussed at the outset, fourteen states have enacted laws that allow law enforcement use of UAS.[211] While all states will inevitably pass such legislation, these fourteen states' laws constitute the current "labs of federalism." Through these laws we gain an appreciation of the varied interests and concerns in different parts of the United States.

A. What They Do and What They Do Not Do

States' legislation provides interesting comparisons of the utility of different legislative approaches. One approach makes law enforcement's use of UAS the baseline, subject to limitation, while another approach prohibits UAS subject to exceptions allowing their use.[212] While the approaches can lead to the same outcome, the default setting of either permitting or restricting is significant. In some cases a baseline of prohibiting UAS is the most likely reason that law enforcement does not employ UAS to document crime or accident scenes, despite being able to utilize UAS in other ways. In the long run, assuming that UAS technology indeed becomes ubiquitous, the likely outcome is that society will identify law enforcement uses with which it is uncomfortable while allowing all other uses. But for now, there is a broad array of approaches to consider.

B. Definitions

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211. *See supra* note 2 (listing Alaska, Florida, Idaho, Illinois, Indiana, Iowa, Louisiana, Montana, North Carolina, Oregon, Tennessee, Texas, Utah and Wisconsin as states that have allowed law enforcement use of UAS technology). In 2013, Virginia adopted a two-year moratorium on the law enforcement UAS use. *See supra* note **Error! Bookmark not defined.** and accompanying text (discussing the moratorium).

212. *Compare* FLA. STAT. § 934.50 (2014) (providing that a "law enforcement agency may not use a drone to gather evidence or other information" subject to exceptions), *with* OR. REV. STAT. § 837.320 (2014) (allowing drone use as long as "law enforcement agency has probable cause to believe that . . . exigent circumstances exist").

As with all areas of the law, terms and definitions are important. Indiana, for example, defines "unmanned aerial vehicles" as "tracking devices,"[213] while Wisconsin utilizes the term "drone" and only regulates drones capable of recording images or sound.[214] Other states, Alaska for example, refer to UAS and define them in the same manner as the FAA.[215] As discussed at the outset of this Article, these varied definitions will be problematic as systems become more autonomous. Society (and the law) needs to distinguish between remotely piloted and increasingly autonomous systems.[216]

C. Limitations

A number of States' laws do not allow law enforcement to use UAS in what would be considered "open fields."[217] Nor do those

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213. IND. CODE § 35-31.5-2-337.5 (2014) (defining "tracking device" to include unmanned aerial vehicles). Iowa and Utah also use the term "unmanned aerial vehicles" (UAV), but neither classifies them as tracking devices. *See* UTAH CODE ANN. § 63G-18-102 (West 2015) (defining "unmanned aircraft system"); IOWA CODE § 321.492B (2014) (prohibiting the use of unmanned aerial vehicles for traffic law enforcement).

214. *See* WIS. STAT. § 175.55 (2014) (restricting the use of drones). Oregon's legislation clarifies that "drone does not include a model aircraft" based on a 2012 FAA definition of "model aircraft." OR. REV. STAT. § 837.300 (2014) (defining "drone"). While 2012 is relatively recent, the FAA currently considers model aircraft as UAS as previously discussed. *See supra* note 46 and accompanying text (discussing the FAA's definitions of UAS).

215. ALASKA STAT. § 18.65.909(2) (2014) (defining "unmanned aircraft system"). Idaho, Louisiana, and North Carolina also refer to UAS. *See* IDAHO CODE ANN. § 21-213 (West 2015) (restricting the use of unmanned aircraft systems); LA. REV. STAT. ANN. § 14:337 (West 2015) (same); N.C. GEN. STAT. § 15A-300.1 (West 2015) (same). Tennessee and Texas use the term "unmanned aircraft." *See* TENN. CODE ANN. § 39-13-901 (West 2015) (defining "unmanned aircraft"); TEXAS GOV'T CODE § 423.007 (limiting the use of law enforcement use of unmanned aircraft).

216. *See supra* notes 45, 47 and accompanying text (discussing regulatory and definitional concerns that may arise as UAS technology develops).

217. These states include Florida, Idaho, Illinois, Oregon, Tennessee and Texas. *See* FLA. STAT. § 934.50 (2014) (limiting law enforcement's use of drones); IDAHO CODE ANN. § 21-213 (West 2015) (restricting the use of unmanned aircraft systems); ILL. COMP. STAT. 167/10 (2014) (restricting the use of drones); OR. REV. STAT. § 837.310 (2014) (same); TENN. CODE ANN. § 39-13-903 (West 2015) (prohibiting the use of an "unmanned aircraft to capture an image of an individual or privately owned real property"); TEXAS GOV'T CODE § 423.007 (limiting the use of law enforcement use of unmanned aircraft).

states allow law enforcement to use UAS to acquire information about an individual or their property without their consent.[218] Thus, while law enforcement would not need to ask for consent under *Ciraolo*, *Riley*, or *Dow* to fly a fixed or rotary wing aircraft over someone's property, law enforcement would need consent to conduct the exact same surveillance with a UAS.[219] Some states do not even allow law enforcement to take pictures of crime scenes, a restriction that seems unlikely to last given large and/or remote crime scenes or vehicle accidents.[220] These are all activities that police officers can and do already using other technologies (for example, cameras), so the objection to conducting them via UAS is not based in law.[221] Alaska and Utah have enacted laws which require a warrant before law enforcement may employ UAS, but also allow such use in accordance with a judicially-created exception to the warrant requirement.[222]

Several states' UAS laws contain exceptions with wordings that will likely prove problematic.[223] The laws of Florida, Illinois, North Carolina, and Tennessee all contain an exception by which law enforcement could permissibly use UAS without a warrant to counter a high risk of a terrorist attack if the Homeland Security

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218. *See, e.g.*, TENN. CODE ANN. § 39-13-903 (West 2015) (making it a criminal offense to use an "unmanned aircraft to capture an image of an individual").

219. *See supra* Part V (discussing the "aerial surveillance trilogy" of Supreme Court cases).

220. In Florida for example, "a law enforcement agency may not use a drone to gather evidence or other information" and while there are exceptions to the prohibition, crime or accident scenes are not included. FLA. STAT. § 934.50 (2014).

221. Moreover, UAS would likely conduct these tasks more cheaply, quickly, effectively, and safely than police officers on the ground.

222. *See* ALASKA STAT. § 18.65.902 (2014) (requiring law enforcement to obtain a warrant or act in accordance with a judicially recognized exception); UTAH CODE ANN. § 63G-18-103 (West 2015) (same). This later point may well become the next circular lap in Fourth Amendment inquiry. *See* Kyllo v. United States, 533 U.S. 27, 34 (2001) (acknowledging that trying to determine whether a given expectation of privacy recognized by society "has often been criticized as circular, and hence subjective and unpredictable").

223. *See infra* notes 224–235 and accompanying text (discussing ambiguities and vague terms in state laws).

certifies the risk.[224] But "high," "risk," and "terrorist attack" are undefined.[225]

In similar fashion, Indiana's law contains an unqualified "exigent circumstances" exception.[226] Oregon's law predicates its "exigent circumstances" exception on probable cause.[227] And Tennessee's law allows for law enforcement UAS use to "search[] for a fugitive."[228] Thus, all three states allow for law enforcement UAS use while in pursuit of an individual suspected of committing nothing more than a misdemeanor while restricting UAS use in non-exigent or fleeing cases in which felony misconduct is suspected.[229]

Wisconsin's statute unfortunately demonstrates the complications arising from current Fourth Amendment case law.[230] Under that law, "[n]o Wisconsin law enforcement agency may use a drone to gather evidence or other information in a criminal investigation from or at a place where an individual has a reasonable expectation of privacy without first obtaining a search warrant."[231] While restrictive, the provision seems straightforward enough. Until the next sentence, "[t]his subsection does not apply to the use of a drone in a public place . . . ."[232] What then for the

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224. *See* FLA. STAT. § 934.50 (2014) (listing exceptions to a warrant requirement); 725 ILL. COMP. STAT. 167/15 (2014) (same); N.C. GEN. STAT. § 15A-300.1 (West 2015) (same); TENN. CODE ANN. § 39-13-609 (West 2015) (same).

225. *See supra* note 224 and accompanying text (gathering statutes that allow law enforcement use of UAS when there is a credible risk of terrorist activities, but not defining specific terms).

226. *See* IND. CODE § 35-33-5-9 (2014) (allowing UAS use when required due to "the existence of exigent circumstances necessitating a warrantless search").

227. *See* OR. REV. STAT. § 837.320 (2014) (allowing drone use when a "law enforcement agency has probable cause to believe that . . . exigent circumstances exist").

228. *See* TENN. CODE ANN. § 39-13-609 (West 2015) (allowing UAS use "when law enforcement is searching for a fugitive or escapee or is monitoring a hostage situation").

229. *See supra* notes 227–228 and accompanying text (collecting statutes). The exceptions to the Texas prohibition on law enforcement UAS use specifically exclude misdemeanors. *See* TEX. GOV'T CODE § 423.002 (2014) (allowing UAS use for some law enforcement purposes, but not for "misdemeanors or offenses punishable by a fine only").

230. *See* WIS. STAT. § 175.55 (2014) (restricting the use of drones).

231. *Id.*

232. *Id.*

camera-equipped law enforcement UAS operating at 400 feet, in public airspace, over someone's home?

Idaho's law excepts out much of what otherwise could have been its signaling function in terms of how people in Iowa view law enforcement surveillance and privacy.[233] The law is on one hand restrictive, requiring a warrant before any state entity may use a UAS.[234] The law provides for the common exceptions of emergency response for safety and search and rescue but also creates an exception for controlled substance investigations.[235] Excepting out controlled substance investigations from the warrant requirement is significant. Consider that two of the aircraft surveillance trilogy cases and both technology cases involved controlled substance investigations.

The states' efforts in regulating law enforcement UAS use seem ineffectual towards any goal other than being able to claim to the electorate and media to have "taken action." They regulate but one category of unmanned systems capable of surveillance when three exist.[236] Likely due in part to their reactionary nature, the laws employ undefined and even contradictory terms.[237] It would be one thing if these laws merely decreased law enforcement efficiency, which to some may be a desirable goal. But these laws decrease law enforcement efficiency while, at the same time, failing to advance citizens' privacy interests.

If a case reaches the Supreme Court it will likely be as the result of the poor drafting of the law or its exceptions rather than a deliberate effort by a State to mark out its views towards if and how technology is altering the balance between privacy and law enforcement. While on the whole this first round of state lab experiments is not yielding useful results, other ideas in different states bear watching.

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233. *See* IDAHO CODE ANN. § 21-213 (West 2015) (defining and restricting the use of unmanned aircraft systems).

234. *See id.* ("Absent a warrant, and except for emergency response for safety search and rescue or controlled substance investigations, no person, entity or state agency shall use an unmanned aircraft system to intentionally conduct surveillance . . . .").

235. *Id.*

236. *See supra* notes 59–60 and accompanying text (noting ground and maritime variants of unmanned surveillance systems apart from aerial systems).

237. *See supra* notes 225–238 and accompanying text (discussing ambiguities and vague terms in state laws).

D. A Single Courageous State?

An interesting proposal in Connecticut attempts to maximize the potential of law enforcement UAS use while balancing against the concern that at some point continuous surveillance itself might constitute a search and violate constitutional privacy rights.[238] The Connecticut General Assembly's Legislative Program Review and Investigations Office issued findings and recommendations on "drone use regulation" in December 2014.[239] They proposed that:

> The use of drones by Connecticut law enforcement agencies for surveillance of a specific individual or a privately-held property is prohibited except with the person or property owner's consent or when the duration of such drone-based surveillance is limited to the following conditions:
>
> Drone-based surveillance of a specific individual or a privately-held property:
>
> 1. without reasonable suspicion, shall be limited to 30 minutes total cumulative duration within a 30-day time period
> 2. with reasonable suspicion of criminal activity, but without the combination of probable cause and a valid warrant, shall be limited to 24 hours total cumulative duration within a 30-day cumulative time period; and
> 3. with probable cause and a valid warrant, shall be limited to the terms of the warrant
>
> A person or privately-held property shall not be considered the target of such surveillance unless the person or property is identifiable via the drone's imagine or other information-gathering device or is otherwise acknowledge as the intended target of such surveillance.[240]

While not law, at least not yet, this is the only proposal that attempts to identify the bounds of societal expectations of reasonableness in terms of privacy from law enforcement

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238. *See* CONN. GEN. ASSEMBLY LEGISLATIVE PROGRAM REVIEW & INVESTIGATIONS COMM., STAFF FINDINGS & PROPOSED RECOMMENDATIONS: DRONE USE REGULATION (2014) (reporting expected advantages and disadvantages of law enforcement UAS use in Connecticut).

239. *Id.*

240. *Id.* at 27.

surveillance not accompanied by a trespass.[241] It utilizes a sliding scale linking the amount of permissible UAS surveillance to the quantum and type of suspicion of wrongdoing. And it reflects both the majority and Justice Alito's concurring opinion in *Jones* that at a certain point constant warrantless law enforcement surveillance may well violate our constitutional right to privacy.[242] This proposal, were it to become law in Connecticut or elsewhere, might amount to the novel social experiment Justice Brandeis called for. And such a law, if (and when) challenged, would provide a useful vehicle by and through which the state and federal judiciary could consider the Fourth Amendment and government surveillance not accompanied by a trespass.

VIII. Conclusion

Each technological advancement in our modern society, from automobile to wiretap, fingerprint to DNA, has yielded concerns about the corresponding increase in law enforcement capabilities and, in turn, what that means for civil liberties.[243] And with each advancement balance is restored, if it was ever lost, in the relationship between the individual and government. It is restored as the result of open discussion and deliberative legislative processes.[244]

The downside to the current state efforts to legislate law enforcement UAS use is that we are sacrificing law enforcement efficiency, which comes with a real—albeit hard to quantify—

241. *See generally* RICHARD M. THOMPSON II, CONG. RES. SERV., DRONES IN DOMESTIC SURVEILLANCE OPERATIONS: FOURTH AMENDMENT IMPLICATIONS AND LEGISLATIVE RESPONSES (2013) (analyzing the legality of the use of drones under the Fourth Amendment). In the end, determining "reasonableness" is perhaps the most important inquiry in the Fourth Amendment analysis. *See* Peter Swire, *A Reasonableness Approach to Searches After the Jones GPS Tracking Case*, 64 STAN. L. REV. ONLINE 57, 58, (2012) (discussing the test for reasonableness in Fourth Amendment cases involving recent technology).

242. *See supra* note 201 and accompanying text (discussing Justice Alito's concurring opinion in *Jones*).

243. *See supra* Part VI (discussing Fourth Amendment jurisprudence and advances in technology).

244. *Id.*

societal cost.[245] Where we limit law enforcement, as indeed we should, the limitations must be deliberate, not accidental.

The upside to these efforts is that they are likely well within the bounds of Fourth Amendment. There is considerable room (and need) for states to continue to experiment with protecting privacy while providing security. Equipoise may be only aspirational, but we can do more and be better at seeking a balance. In the words of Irish writer Samuel Beckett: "Ever tried. Ever failed. No matter. *Try again. Fail again. Fail better.*"[246]

245. *See supra* notes 225–239 (discussing problematic language and restrictions in current statutes regulating law enforcement use of UAS).

246. SAMUEL BECKETT, WORSTWARD HO 1 (1983) (emphasis added).