

# Drones and the Future of Aerial Surveillance

Gregory S. McNeal\*

## ABSTRACT

*For the first time in American history a regulatory regime is about to allow for small aircraft without onboard pilots—drones—to fly in the national airspace. Legal and technological developments have thus made it all but certain that drones will be a catalyst for new ways of thinking about privacy and surveillance. This is especially the case because the drones that the FAA have approved for operation in the national airspace (small aircraft under fifty-five pounds) are the exact type of drones that local law enforcement will be most likely to acquire and use. Thus, the battle over privacy and aerial surveillance will be fought in statehouses throughout the country. This Article seeks to frame future discussions about how states will handle the privacy issues associated with aerial surveillance.*

*The Article takes the counterintuitive position that technology has the potential to make unmanned aerial surveillance more protective of privacy than manned surveillance. It further argues that scholars and legislators should move beyond a warrant-based, technology centric approach to protecting privacy from aerial surveillance. Such an approach is unworkable, counter-productive, and may stifle efforts to enact more privacy protective legislative regimes. Instead, this Article proposes that legal reforms should focus on excluding low altitude flights and surveillance coupled with imposing limits on persistent surveillance, requiring enhanced accountability procedures for data retention and access, and creating new transparency, accountability and oversight measures.*

---

\* Associate Professor of Law and Public Policy, Pepperdine University; Co-founder of AirMap. Portions of this research were sponsored by The Brookings Institution and were published by Brookings as a short paper. See GREGORY MCNEAL, BROOKINGS INST., DRONES AND AERIAL SURVEILLANCE: CONSIDERATIONS FOR LEGISLATORS (2014), [http://www.brookings.edu/~media/Research/Files/Reports/2014/10/drones-aerial-surveillance-legislators/Drones\\_Aerial\\_Surveillance\\_McNeal\\_FINAL.pdf?la=en](http://www.brookings.edu/~media/Research/Files/Reports/2014/10/drones-aerial-surveillance-legislators/Drones_Aerial_Surveillance_McNeal_FINAL.pdf?la=en). Excerpts from this Article also appeared in congressional testimony before the House Judiciary Committee and were shared with or were the subject of briefings before the National Lieutenant Governors Association and the National League of Cities. This Article was presented in workshops and presentations at Stanford, Michigan, Georgetown, Brookings, Pepperdine, Boston College, the University of Washington, the UAS Commercialization Conference, and the 2014 Association of Unmanned Aerial Vehicle Systems International—Unmanned Expo. I'm thankful for thoughtful comments from Anupam Chander, Orin Kerr, Elizabeth Joh, Stuart Banner, John Radsan, Stacy New, Emma Graham, Victoria Schwartz, Hank Greely, Ben Wittes, John Villasenor, Wells Bennett, Julie Cohen, Michael Toscano, Margot Kaminski, Evan Selinger, Mary Rose Papandrea, Ryan Calo, and sometimes anonymous but nevertheless thoughtful commenters at Forbes.com.

## TABLE OF CONTENTS

INTRODUCTION .....	356
I. AN OVERVIEW OF THE DRONE LAW LANDSCAPE .....	362
A. <i>The February 2015 Notice of Proposed Rulemaking</i> .....	362
B. <i>The Evolving Drone-Related Legal Landscape</i> .....	363
C. <i>Privacy Executive Order</i> .....	368
1. Rules for Federal Government Drone Operations .....	369
2. Process for Crafting Rules for Private Drones ..	371
II. AIRSPACE RIGHTS, TECHNOLOGICAL DISRUPTION, AND THE CURRENT STATE OF AERIAL SURVEILLANCE LAW .....	371
A. <i>The Significance of Vantage Points</i> .....	373
B. <i>Ciraolo, Dow, and Riley</i> .....	374
C. <i>Low-Altitude Airspace Rights</i> .....	378
D. <i>Why Existing Law Won't Protect Privacy</i> .....	381
III. PRIVACY- AND WARRANT-BASED REFORM PROPOSALS .....	384
A. <i>Introduction to the Fight over Drones and Privacy</i> ..	384
B. <i>Reject Warrants</i> .....	386
C. <i>Reject Use Restrictions</i> .....	389
D. <i>Recognize the Nuanced Nature of Surveillance Law and the Context-Based Exceptions to the Warrant Requirement</i> .....	391
E. <i>Embrace Technology</i> .....	394
IV. REFORMS .....	396
A. <i>Defining Property Rights Is a Necessary but Insufficient Part of Reform</i> .....	396
1. Property Rights Should Be Defined .....	399
2. "Navigable Airspace" Is No Longer a Helpful Reference Point .....	402
B. <i>Place Limits on How Long the Government May Surveil from the Air</i> .....	406
C. <i>Adopt Data-Retention Procedures That Require Heightened Levels of Suspicion and Increased Procedural Protections over Time</i> .....	408
D. <i>Adopt Transparency and Accountability Measures</i> ..	410
E. <i>Institutionalized Oversight</i> .....	413
CONCLUSION .....	415

## INTRODUCTION

On the Sunday of President's Day weekend 2015, Secretary of Transportation Anthony Foxx and Federal Aviation Administration ("FAA") Administrator Michael Huerta convened a hastily arranged public conference call to announce regulations that would allow for the integration of drones into the national airspace.<sup>1</sup> The regulations are historic; for the first time in American history, aircraft operating without onboard pilots will have a regulatory regime to govern their use.<sup>2</sup> Sunday of a holiday weekend was an odd time to announce the most significant aviation-related regulations since the creation of the FAA, but the Agency's hand was forced.<sup>3</sup> A little more than twenty-four hours before the conference call, I wrote a column for *Forbes*, revealing the details of the pending regulations; the Associated Press and the *Wall Street Journal* credited the column with first reporting the news that forced the FAA to announce their regulations.<sup>4</sup>

The use of drones for surveillance has to date been a sparsely discussed topic in legal scholarship; however, the FAA's proposed changes to federal law make it all but certain that drones will be a catalyst for new ways of thinking about privacy and surveillance.<sup>5</sup> This

---

1 See Media Advisory—DOT and FAA Announce New Rules for Unmanned Aircraft Systems, FED. AVIATION ADMIN. (Feb. 14, 2015), [https://www.faa.gov/news/media\\_advisories/news\\_story.cfm?newsId=18294](https://www.faa.gov/news/media_advisories/news_story.cfm?newsId=18294).

2 See, e.g., Joan Lowy, *FAA Seeking Drone Rules Favorable to Commercial Operators*, ASSOCIATED PRESS (Feb. 14, 2015), reprinted at <http://www.msn.com/en-us/news/technology/faa-seeking-drone-rules-favorable-to-commercial-operators/ar-AA9pRFu>.

3 Gregory S. McNeal, *Leaked FAA Document Provides Glimpse into Drone Regulations*, FORBES (Feb. 14, 2015, 4:40 AM), <http://www.forbes.com/sites/gregorymcneal/2015/02/14/the-faa-may-get-drones-right-after-all-9-insights-into-forthcoming-regulations/>.

4 See Lowy, *supra* note 2 (acknowledging that Forbes first reported the impending regulations); Jack Nicas, *Federal Document Sheds Light on Proposed Drone Rules*, WALL ST. J. (Feb. 14, 2015, 7:37 PM), <http://www.wsj.com/articles/online-document-sheds-light-on-proposed-drone-rules-1423960620> (same); see also McNeal, *supra* note 3 ("AP and *The Wall Street Journal* credited this post with first reporting the story about the regulations, which are now out for public comment.").

5 Technically known as unmanned aerial vehicles or unmanned aircraft systems, this Article refers to these devices by their colloquial name—drones. For some of the prescient works discussing drones or surveillance issues that might touch on drones, see WELLS C. BENNETT, BROOKINGS INST., CIVILIAN DRONES, PRIVACY, AND THE FEDERAL-STATE BALANCE (2014), <http://www.brookings.edu/research/reports2/2014/09/civilian-drones-and-privacy>; M. Ryan Calo, *The Drone As Privacy Catalyst*, 64 STAN. L. REV. ONLINE 29 (2011); David Gray & Danielle Citron, *The Right to Quantitative Privacy*, 98 MINN. L. REV. 62 (2013); Margot E. Kaminski, *Drone Federalism: Civilian Drones and the Things They Carry*, 4 CAL. L. REV. CIRCUIT 57 (2013); Troy A. Rule, *Airspace in an Age of Drones*, 95 B.U. L. REV. 155 (2015); Michael L. Smith, *Regulating Law Enforcement's Use of Drones: The Need for State Legislation*, 52 HARV. J. ON LEGIS. 423 (2015); Andrew B. Talai, Comment, *Drones and Jones: The Fourth Amendment and Police Discretion in the Digital Age*, 102 CALIF. L. REV. 729 (2014).

Article seeks to frame future discussions about how state and local governments will handle the privacy issues associated with aerial surveillance. To this end, this Article proposes innovative reforms that move beyond the call for requiring warrants for the use of drones.

The FAA's proposed rule is just the start of a new era in aviation. Some estimate that 30,000 drones will be flying in the national airspace ("NAS") by the end of the decade,<sup>6</sup> while others suggest that as many as one million drones will be sold in 2015 alone.<sup>7</sup> According to the FAA, "[o]nce the entire integration process is complete, the FAA envisions the NAS populated with UAS [unmanned aircraft systems] that operate well beyond the operational limits proposed in" the rule announced on February 15, 2015.<sup>8</sup>

Drones will be a catalyst for new ways of thinking about privacy and surveillance, but contrary to the hopes of many advocates, the FAA did not address privacy in its proposed rules.<sup>9</sup> Rather, the FAA explicitly stated that matters relating to privacy, civil rights, and civil liberties were beyond the scope of its rulemaking.<sup>10</sup> Instead, President Obama directed that privacy issues related to the federal government's use of drones be handled according to the terms outlined in a Presidential Memorandum, while the issues raised by private uses of drones be addressed through rules to be created during a multis-takeholder process led by the National Telecommunications and In-

---

<sup>6</sup> *The Future of Drones in America: Law Enforcement and Privacy Considerations: Hearing Before the S. Comm. on the Judiciary*, 113th Cong. 2 (2013) (statement of Sen. Patrick J. Leahy, Chairman, S. Comm. on the Judiciary).

<sup>7</sup> Jake Swearingen, *1 Million Drones Will Be Sold This Christmas, and the FAA Is Terrified*, POPULAR MECHANICS (Sept. 29, 2015), <http://www.popularmechanics.com/flight/drones/news/a17535/the-faa-is-terrified-that-1-million-drones-will-be-sold-this-christmas/>.

<sup>8</sup> Operation and Certification of Small Unmanned Aircraft Systems, 80 Fed. Reg. 9544, 9552 (proposed Feb. 23, 2015) (to be codified at 14 C.F.R. pt. 107) [hereinafter NPRM].

<sup>9</sup> See, e.g., Patrice Hendriksen, Note, *Unmanned and Unchecked: Confronting the Unmanned Aircraft System Privacy Threat Through Interagency Coordination*, 82 GEO. WASH. L. REV. 207, 228–38 (2013) (proposing FAA involvement in an interagency process among UAS federal stakeholders to address privacy); Kellan Howell, *Invasion: 7,500 Drones in U.S. Airspace Within 5 Years, FAA Warns*, WASH. TIMES (Nov. 7, 2013), <http://www.washingtontimes.com/news/2013/nov/7/faa-chief-announces-progress-drone-regs/?page=all>; Keith Laing, *Markey: Privacy Before Drone Deliveries*, THE HILL (Dec. 2, 2013, 10:53 AM), <http://thehill.com/policy/transportation/191722-markey-protect-privacy-before-drone-deliveries>; Matthew J. Schwartz, *FAA Promises Privacy Standards for Domestic Drones*, DARK READING (Feb. 15, 2013, 11:39 AM), <http://www.darkreading.com/risk-management/faa-promises-privacy-standards-for-domestic-drones/d/d-id/1108691?>; Jay Stanley, *New Eyes in the Sky: Protecting Privacy from Domestic Drone Surveillance*, ACLU: SPEAK FREELY (Dec. 15, 2011, 10:32 AM), <http://www.aclu.org/blog/national-security-technology-and-liberty/new-eyes-sky-protecting-privacy-domestic-drone>.

<sup>10</sup> NPRM, *supra* note 8, at 9552.

formation Administration (“NTIA”), a subordinate agency of the Department of Commerce.<sup>11</sup>

Left out of the proposed regulations, the Presidential Memorandum, and any rules that will come out of the NTIA process, are policies and procedures to govern the use of drones by state and local governments.<sup>12</sup> In fact, it appears that the federal government has decided to entrust those matters to state law. Indeed, the Notice of Proposed Rulemaking (“NPRM”) stated that “state law and other legal protections for individual privacy may provide recourse for a person whose privacy may be affected through another person’s use of a UAS.”<sup>13</sup> Deferring to state and local governments makes sense, as the vast amount of drone use will occur in situations best handled by state and local authorities.<sup>14</sup> For example, state and local operators will be the government agents most likely to use drones in search-and-rescue operations and in support of law enforcement activity like serving a warrant or documenting a crime scene.<sup>15</sup> Similarly, the information

---

<sup>11</sup> *Id.*; see also Gregory S. McNeal, *What You Need to Know About the Federal Government’s Drone Privacy Rules*, FORBES (Feb. 15, 2015, 1:40 PM), <http://www.forbes.com/sites/gregorymcneal/2015/02/15/the-drones-are-coming-heres-what-president-obama-thinks-about-privacy/>; Presidential Memorandum, Promoting Economic Competitiveness While Safeguarding Privacy, Civil Rights, and Civil Liberties in Domestic Use of Unmanned Aircraft Systems, THE WHITE HOUSE (Feb. 15, 2015) [hereinafter Drone Privacy Memo], <https://www.whitehouse.gov/the-press-office/2015/02/15/presidential-memorandum-promoting-economic-competitiveness-while-safegua>.

<sup>12</sup> See NPRM, *supra* note 8, at 9552 (“The FAA also notes that privacy concerns have been raised about unmanned aircraft operations. Although these issues are beyond the scope of this rulemaking . . . the Department [of Commerce] and FAA will participate in the multi-stakeholder engagement process led by the National Telecommunications and Information Administration (NTIA) to assist in this process regarding privacy, accountability, and transparency issues concerning commercial and private UAS use in the NAS. We also note that state law and other legal protections for individual privacy may provide recourse for a person whose privacy may be affected through another person’s use of a UAS.”) (emphasis added)); Drone Privacy Memo, *supra* note 11, at 4 (“The [NTIA] process shall not focus on law enforcement or other noncommercial governmental use.”).

<sup>13</sup> NPRM, *supra* note 8, at 9552.

<sup>14</sup> See Kaminski, *supra* note 5, at 57–58.

<sup>15</sup> See, e.g., 2011–2012 FAA List of Drone License Applicants, ELEC. FRONTIER FOUND., <https://www EFF.ORG/document/2012-faa-list-drone-applicants> (last visited Feb. 26, 2016) (listing many state and local operators that applied for drone licenses); Kevin Bonham, *Grand Forks County Drone Assists at Bemidji Blast Scene*, GRAND FORKS HERALD (Jan. 28, 2015, 6:35 PM), <http://www.grandforksherald.com/news/region/3666035-grand-forks-county-drone-assists-bemidji-blast-scene> (discussing use of drone by Grand Forks County Sheriff’s Department in explosion investigation); Cyrus Farivar, *San Jose Police Department Says FAA Can’t Regulate Its Drone Use*, ARS TECHNICA (Aug. 6, 2014, 5:02 PM), <http://arstechnica.com/tech-policy/2014/08/san-jose-police-say-faa-cant-regulate-its-drone-use-faa-disagrees/> (explaining that San Jose police want to use drones mainly to access potential explosive devices); Mesa Cty. Sheriff’s Office, *UAS Operations Most Frequently Asked Questions* (2015), <http://sheriff.mesacounty.us/WorkArea/linkit>

gathered from a drone for law enforcement will be stored on law enforcement computers and will be subject to state and local laws governing the handling of personally identifiable information (“PII”) and information disclosure.<sup>16</sup> Given the significant law and policy issues that will arise at the local level, this Article focuses on state and local government uses of drones.<sup>17</sup> State and local governments will be the preeminent battleground for law and policy debates about drones, and it appears they are far behind in crafting rules to handle the myriad concerns unrelated to safety that drones will prompt.<sup>18</sup>

Thus, the looming prospect of expanded use of drones has raised understandable concerns for many, and drones will be a source of attention for lawmakers and scholars for years to come.<sup>19</sup> Those concerns have led some to call for legislation mandating that nearly all uses of drones be prohibited unless the government has first obtained a warrant.<sup>20</sup> Privacy advocates have mounted a lobbying campaign that convinced thirteen states to enact laws that regulate the use of

---

.aspx?LinkIdentifier=id&ItemID=11383&libID=11401 (“We most often use [UAS] for crime scene photography, and search and rescue missions.”); Ed Pilkington, “*We See Ourselves As the Vanguard*”: The Police Force Using Drones to Fight Crime, THE GUARDIAN (Oct. 1, 2014, 7:49 AM), <http://www.theguardian.com/world/2014/oct/01/drones-police-force-crime-uavs-north-dakota> (detailing ways Grand Forks Sheriff’s Department has used its drone, including at crime scenes).

<sup>16</sup> See, e.g., CAL. GOV’T CODE § 11019.9 (West 2015) (defining state’s privacy policy for personally identifiable information); COLO. REV. STAT. ANN. § 24-72-502 (West 2015) (same); Corey Ciocchetti, *Just Click Submit: The Collection, Dissemination, and Tagging of Personally Identifying Information*, 10 VAND. J. ENT. & TECH. L. 553, 617–19 (2008) (overviewing laws regarding collection of personally identifying information that some states have in place for both state and local agencies and businesses); see also Stephen Rushin, *The Legislative Response to Mass Police Surveillance*, 79 BROOK. L. REV. 1, 53–59 (2013) (proposing model legislation to maintain privacy of surveillance data collected by police).

<sup>17</sup> It is important to note, however, that for private party uses of drones, most instances of trespass, invasion of privacy, and intrusion upon seclusion will be handled at the local level through property and tort law. See Kaminski, *supra* note 5, at 65.

<sup>18</sup> See Smith, *supra* note 5, at 432–33 (noting that several of the state laws regulating government use of drones are beset by loopholes).

<sup>19</sup> See, e.g., Tom Curry, *Lawmakers Voice Concerns on Drone Privacy Questions*, NBC NEWS (Mar. 20, 2013, 11:54 AM), [http://nbcpolitics.nbcnews.com/\\_news/2013/03/20/17389193-lawmakers-voice-concerns-on-drone-privacy-questions?lite](http://nbcpolitics.nbcnews.com/_news/2013/03/20/17389193-lawmakers-voice-concerns-on-drone-privacy-questions?lite); Somini Sengupta, *Rise of Drones in U.S. Drives Efforts to Limit Police Use*, N.Y. TIMES (Feb. 15, 2013), <http://www.nytimes.com/2013/02/16/technology/rise-of-drones-in-us-spurs-efforts-to-limit-uses.html?pagewanted=all>.

<sup>20</sup> For example, a group of legal scholars wrote a letter in support of a failed California bill requiring warrants for drone use and argued that warrants should be required for drone surveillance, because “drones pose privacy and freedom of expression concerns qualitatively different from those raised by traditional forms of aerial surveillance precisely because they allow inexpensive, sophisticated, and sometimes surreptitious monitoring that goes well beyond the capabilities of law enforcement today.” Letter from Robert Calhoun et al., to Edmund G. Brown, Jr., Governor of State of Cal. (Sept. 4, 2014), <http://arc.asm.ca.gov/member/AD44/pdf/426->

drones by law enforcement, eleven of which now require a warrant before the government may use a drone.<sup>21</sup> The campaigns mounted by privacy advocates oftentimes make a compelling (albeit premature) case about the threat of pervasive surveillance, but the legislation is rarely tailored in such a way to prevent the harm that advocates fear.<sup>22</sup> In fact, in every state where legislation was passed, the new laws are focused on drone *technology*—not the harm (pervasive surveillance).<sup>23</sup> In many cases, this technology-centric approach creates perverse results, allowing the use of extremely sophisticated and pervasive surveillance technologies from manned aircraft,<sup>24</sup> while potentially disallowing benign (non-privacy-invasive) uses of drones for mundane tasks like accident and crime scene documentation, or monitoring of industrial pollution and other environmental harms.<sup>25</sup>

---

AB1327supportletterlawprofs.pdf. Some of the signatories are Dean Erwin Chemerinsky, Professor Christopher Slobogin, and Professor Robert Weisberg. *Id.*

<sup>21</sup> See Smith, *supra* note 5, at 427–32, 433.

<sup>22</sup> See, e.g., JAY STANLEY & CATHERINE CRUMP, ACLU, PROTECTING PRIVACY FROM AERIAL SURVEILLANCE: RECOMMENDATIONS FOR GOVERNMENT USE OF DRONE AIRCRAFT 15–16 (2011), <https://www.aclu.org/files/assets/protectingprivacyfromaerialsurveillance.pdf> (recommending usage and image retention restrictions, notice requirements, and democratic controls in response to “potentially extremely powerful surveillance tools” of drones).

<sup>23</sup> See Smith, *supra* note 5, at 427–32 (surveying state laws); see also, e.g., FL. STAT. ANN. § 934.50(2)(a) (West 2015) (defining “drone” as “a powered, aerial vehicle that: 1. Does not carry a human operator; 2. Uses aerodynamic forces to provide vehicle lift; 3. Can fly autonomously or be piloted remotely; 4. Can be expendable or recoverable; and 5. Can carry a lethal or nonlethal payload.”); OR. REV. STAT. ANN. § 837.300(1) (West 2014) (“‘Drone’ means an unmanned flying machine.”).

<sup>24</sup> For nine days in early 2012, a small plane flew continuous circles over the City of Compton, California, beaming low-resolution images to the sheriff’s department in an attempt to view crime in real time, and then have the ability to follow the assailants from above. See Angel Jennings, Richard Winton & James Rainey, *Sheriff’s Secret Air Surveillance of Compton Sparks Outrage*, L.A. TIMES (Apr. 23, 2014, 5:05 PM), <http://www.latimes.com/local/lanow/la-me-ln-sheriffs-surveillance-compton-outrage-20140423-story.html#page=1>. Because this sophisticated blanket surveillance was manned, it was perfectly legal, and no drone surveillance law would ban it.

<sup>25</sup> See Smith, *supra* note 5, at 433–34. For example, the Michigan State Police are hoping to get FAA approval to use drones to photograph accident scenes. Chad Livengood, *State Police Float Michigan-Wide Drone Use*, DETROIT NEWS (Jan. 26, 2015, 11:47 PM), <http://www.detroitnews.com/story/news/politics/2015/01/26/michigan-state-police-drone/22386343/>. The Ontario, Canada Provincial Police have been fielding drones in the Toronto metro area for the last two years and have found that drones can decrease the time needed to photograph and reconstruct a highway accident scene from two hours to just fifteen minutes. *Id.* For other drone uses unlikely to invade privacy, see Adam Martin, *Using Drones to Capture Environmental Violations Makes Perfect Sense*, THE WIRE (Jan. 25, 2012, 6:15 PM), <http://www.thewire.com/technology/2012/01/using-drones-capture-environmental-violations-makes-perfect-sense/47872/> (noting that drones of all types—big, small, expensive, and inexpensive—are being used around the world to monitor environmental violations, from illegal logging in Brazil to illegal dumping into a river in Texas).

This Article argues that scholars and legislators should move beyond a warrant-based, technology-centric approach to protecting privacy from aerial surveillance. Such an approach is unworkable, counterproductive, and may stifle efforts to enact more privacy-protective legislative regimes. Instead, legal reform proposals should focus on excluding low-altitude flights and surveillance coupled with imposing limits on persistent surveillance, requiring enhanced accountability procedures for data retention and access, and creating new transparency and accountability measures. This Article takes the counterintuitive position that technology may make unmanned aerial surveillance more protective of privacy than manned surveillance.

Specifically, this Article makes five core recommendations. First, landowners should have the right to exclude aircraft, persons, and other objects from a column of airspace extending from the surface of their land up to 200 feet above ground level. Such an approach is a necessary, albeit insufficient, solution aimed at addressing low-altitude overflights and surveillance, but is only a stopgap measure, as sophisticated surveillance technology continues to evolve and will eventually allow for high-quality surveillance from higher altitudes. Second, to address the threat of persistent surveillance of particular individuals, this Article argues that legislators should craft simple, duration-based surveillance legislation that will limit the aggregate amount of time the government may surveil a specific individual. Third, to address the possibility that drones and other sophisticated aerial surveillance technology will allow the government to build a comprehensive picture of an entire community's daily movements (a different persistent surveillance harm), governments should enact laws mandating data-retention procedures that require heightened levels of suspicion and increased procedural protections for accessing stored data gathered by aerial surveillance coupled with a requirement that data be deleted after a legislatively mandated period of time. Fourth, governments should impose enhanced transparency and accountability measures, requiring agencies to publish on a regular basis information about the use of aerial surveillance devices (both manned and unmanned), and should consider creating local oversight boards to police the use of surveillance technologies. Fifth, legal reformers should recognize that technology, such as geofencing and auto-redaction, may make aerial surveillance by drones more protective of privacy than human surveillance.

This Article proceeds as follows: Part I provides an overview of the drone law landscape, focusing on the FAA's February 2015 notice



of proposed rulemaking, the evolving drone-related legal landscape, and President Obama's recent executive actions related to drones and privacy. Part II provides necessary background information regarding airspace rights and technological disruption, focusing on the significance of vantage points in aerial surveillance jurisprudence. This Part also explains how the uncertainty associated with low-altitude airspace rights will influence the debate over drones and privacy.<sup>26</sup> Part III provides an overview of the most popular reform proposal for dealing with drones and privacy—the requirement that drone use be accompanied by a warrant.<sup>27</sup> This Part rejects this popular reform and the associated use restrictions that are frequently proposed. After rejecting warrants and use restrictions, Part IV proposes five reforms that will be more protective of privacy than any currently advanced by scholars or legislators.<sup>28</sup>

## I. AN OVERVIEW OF THE DRONE LAW LANDSCAPE

### A. *The February 2015 Notice of Proposed Rulemaking*

The FAA Modernization and Reform Act of 2012<sup>29</sup> directed the FAA to integrate unmanned aircraft systems, colloquially known as drones, into the national airspace by September 2015.<sup>30</sup> On February 15, 2015, the FAA released its Notice of Proposed Rulemaking (“NPRM”) for the Operation and Certification of Small Unmanned Aircraft Systems.<sup>31</sup> Those regulations will allow the routine use of small drones in America.<sup>32</sup> The regulations will allow individuals to operate a drone if they are at least seventeen years of age and have passed an aeronautical knowledge test.<sup>33</sup> The drones those operators may fly must weigh less than fifty-five pounds, the flights must take place during daylight hours, and the aircraft must remain within visual line of sight of the operator.<sup>34</sup> For identification purposes, operators will be required to register their aircraft and ensure the aircraft has markings that meet FAA guidelines.<sup>35</sup> Unlike manned aircraft, un-

---

26 Portions of Part II also appear in a paper published by Brookings. See McNEAL, *supra* note \*, at 5–11.

27 Portions of Part III also appear in a paper published by Brookings. *Id.* at 22–27.

28 Portions of Part IV also appear in a paper published by Brookings. *Id.* at 12–22.

29 FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, 126 Stat. 11.

30 *Id.* § 332(a)(1), 126 Stat. at 73.

31 See NPRM, *supra* note 8.

32 See *id.* at 9544.

33 *Id.* at 9546.

34 *Id.*

35 *Id.*

manned aircraft will not be required to undergo airworthiness standards or certification requirements; instead, operators themselves will be responsible for ensuring their aircraft are safe for flight, presumably by conducting a preflight inspection before takeoff.<sup>36</sup> The new regulations will not apply to model aircraft if those operators continue to satisfy all of the criteria specified in section 336 of the FAA Modernization and Reform Act, including the stipulation that they be operated only for hobby or recreational purposes.<sup>37</sup> The proposed rule maintains the existing prohibition against operating in a careless or reckless manner.<sup>38</sup> It also would bar an operator from allowing any object to be dropped from the UAS.<sup>39</sup>

### B. *The Evolving Drone-Related Legal Landscape*

Although the proposed regulations from the FAA are a recent development, some states began legislating in anticipation of the FAA's regulations (or perhaps in response to the rise in the number of reported unauthorized drone flights).<sup>40</sup> The first drone-related legislation at the state level appeared in 2013 in Florida, Idaho, Montana, Oregon, North Carolina, Tennessee, Texas, and Virginia.<sup>41</sup> In 2014, Illinois, Indiana, Iowa, Utah, and Wisconsin also passed laws seeking to address the use of drones by law enforcement.<sup>42</sup> California's propo-

---

<sup>36</sup> *Id.*

<sup>37</sup> *Id.*; see also Interpretation of the Special Rule for Model Aircraft, 79 Fed. Reg. 36,172, 36,173 (June 25, 2014) (to be codified at 14 C.F.R. pt. 91). The rules state that a model aircraft must be "flown within visual line of sight of the person operating the aircraft" and must be "flown strictly for hobby or recreational use." *Id.* Furthermore, model aircraft must weigh fifty-five pounds or less, *id.*, and if operating the model aircraft within five miles of an airport, the operator must notify the control tower. *Id.* at 36,175.

<sup>38</sup> NPRM, *supra* note 8, at 9546, 9566.

<sup>39</sup> See *id.* at 9566.

<sup>40</sup> See, e.g., Gregory A. Hall, *Drones' Promise Weighed Against Privacy, Safety*, COURIER-JOURNAL (Dec. 14, 2014, 8:06 AM), <http://www.courier-journal.com/story/money/2014/12/13/drones-promise-weighted-privacy-safety/20357485> (quoting Kentucky legislator stating that "[e]ven if the concerns are somewhat premature and drones have many legitimate uses, the potential for abuse is great and should be addressed as soon as possible").

<sup>41</sup> See Freedom from Unwarranted Surveillance Act, ch. 33, 2013 Fla. Laws 364; Act of Apr. 11, 2013, ch. 328, 2013 Idaho Sess. Laws 859; Act of May 1, 2013, ch. 377, 2013 Mont. Laws 1509; Current Operations and Capital Improvements Appropriations Act of 2013, No. 360, § 7.16.(e) 2013 N.C. Sess. Laws. 1040; Act of July 29, 2013, ch. 686, 2013 Or. Laws 1869; Freedom from Unwarranted Surveillance Act, 2013 Tenn. Pub. Acts ch. 470; 2013 Tex. Gen. Laws 3691; Act of Apr. 3, 2013, ch. 755, 2013 Va. Acts 1408.

<sup>42</sup> Freedom from Drone Surveillance Act, No. 569, 2013 Ill. Laws 6803; Act of Mar. 26, 2014, No. 170, 2014 Ind. Acts 2234; Act of May 23, 2014, ch. 1110, 2014 Iowa Acts 324; Act of Apr. 1, 2014, ch. 399, 2014 Utah Laws 2095; Act of Apr. 8, 2014, No. 213, 2013 Wis. Sess. Laws 1120.

sal for a warrant requirement was vetoed by the governor;<sup>43</sup> but for the 2015 legislative session, new bills have been pending in California, Colorado, Connecticut, New Mexico, North Carolina, North Dakota, and Washington.<sup>44</sup> These legislative efforts have been largely aimed at restricting the government's use of drone technology, while neverthe-

---

43 See Phil Willon & Melanie Mason, *Governor Vetoes Bill That Would Have Limited Police Use of Drones*, L.A. TIMES (Sept. 28, 2014, 7:09 PM), <http://www.latimes.com/local/political/la-me-ln-governor-vetoes-bill-to-limit-police-use-of-drones-20140928-story.html>. California's Governor Brown vetoed the bill because "[t]he measure appeared to impose restrictions on law enforcement that go beyond federal and state constitutional protections against unreasonable search and seizures and the right to privacy." *Id.*

44 A bill currently in the Washington State House "would prohibit the use of drones to collect 'personal information' without a warrant. Once such warrants are issued, the legislation allows their use for ten days. The legislation also bans public agencies from even acquiring drones without specific authorization from the appropriate governing body." Michael Boldin, *Bill to Stop Warrantless Drone Surveillance Passes First Step in Washington State*, TENTH AMEND. CTR. (Feb. 13, 2015), <http://blog.tenthamentendmentcenter.com/2015/02/bill-to-stop-warrantless-drone-surveillance-passes-first-step-in-washington-state/>. The Maryland House of Delegates is considering a new bill, HB620, that would limit the use of drones by preventing "state agencies from conducting surveillance using drones without first obtaining a warrant. There are exceptions in the bill for drone use during emergency response situations and for search and rescue. The bill further makes it illegal for private citizens to use drones to eavesdrop on their neighbors." Sonya Burke, *State Delegate Introduces Legislation to Limit Use of Drones*, MONTGOMERY COMMUNITY MEDIA (Feb. 18, 2015), <http://www.mymcmmedia.org/state-delegate-introduces-legislation-to-limit-use-of-drones/>. The proposed New Mexico bill "would prevent material collected without a warrant from being used in court and would allow people targeted by drones to seek civil action." Russell Contreras, *NM Joins Other States in Grappling with Drones*, KRQE NEWS 13 (Feb. 24, 2015, 1:57 PM), <http://krqe.com/2015/02/24/nm-joins-other-states-in-grappling-with-drones/>. The bill, however, would not prohibit the use of a drone when "swift action is necessary to prevent imminent danger to life." *Id.* (internal quotation marks omitted). The North Carolina General Assembly will consider a bill that "would tighten the authority of the state's chief information officer to approve or disapprove the use of drones by the state or a political subdivision of the state, as well as place limits on disclosure of personal information on any person acquired through the operation of a drone." Richard Craver, *Proposed State Legislation Doesn't Deal with Proper Limits on Monitoring by Law Enforcement*, WINSTON-SALEM J. (Feb. 15, 2015, 12:05 AM), [http://www.journalnow.com/news/local/proposed-state-legislation-doesn-t-deal-with-proper-limits-on/article\\_74185f49-0626-51da-9ec6-6504bc955123.html](http://www.journalnow.com/news/local/proposed-state-legislation-doesn-t-deal-with-proper-limits-on/article_74185f49-0626-51da-9ec6-6504bc955123.html). The Connecticut state legislature will be holding hearings in the near future to weigh possible drone legislation. See Bill Cummings, *State to Hold Drone Hearings on Regulation of Drones*, CTPOST.COM, <http://www.ctpost.com/local/article/Connecticut-to-hold-drone-hearings-6083993.php> (last updated Feb. 16, 2015, 11:34 PM). A Colorado bill "would require law enforcement agencies to acquire a warrant before using an unmanned aerial vehicle." Ryan Haarer, *MCSO Not on Board with Drone Legislation*, KUSA.COM (Feb. 17, 2015, 6:37 PM), <http://www.9news.com/story/news/local/politics/2015/02/17/colorado-police-drones-use/23565283/>. The North Dakota House of Representatives overwhelmingly passed a bill, HB1328, that if passed by the Senate and signed into law would "require law enforcement agencies to obtain a warrant before deploying a drone for surveillance purposes with only a few exceptions. The legislation also provides a blanket prohibition on the use of weaponized drones, on the use of unmanned aircraft for private surveillance, and on drone surveillance of persons exercising their right of free speech or assembly." Mike Maharrey, *North Dakota House Passes Bill to Stop Warrantless Drone Spy-*

less allowing the government to conduct identical (or perhaps more intrusive) surveillance from manned aircraft.<sup>45</sup> This absurd anachronism is not unknown; privacy advocates have explicitly chosen to capitalize on the public interest and attention associated with drone technology as a way to achieve legislative victories while not pursuing a legislative strategy aimed at similarly intrusive manned technology.<sup>46</sup> In other words, some advocates are admittedly focused only on drones, rather than on legislation that addresses all surveillance harms irrespective of the technology used.

There is a significant policy harm that flows from a singular focus on drones: by solely focusing on privacy concerns that come from drone technology but not addressing the broader concerns of aerial surveillance at large, advocates are missing an opportunity to use drones as a vehicle for more widespread privacy-oriented reforms. This Article argues that this is a shortsighted course of action. Although one of this Article's proposals focuses on the location from which surveillance takes place—a reform largely targeted at drones—it further argues that reforming data-retention procedures and surveillance techniques can have a much broader impact on all types of aerial surveillance. The proposals outlined in this Article, if adopted, will do more to protect privacy than any of the reforms currently proposed by privacy advocates and will still allow for innovation and justifiable law enforcement activities.

By way of background, it is important to note that privacy advocates contend that drones will enable the government to engage in widespread pervasive surveillance because drones are cheaper to operate than their manned counterparts.<sup>47</sup> Although it is true that

---

ing 74–19, TENTH AMEND. CTR. (Feb. 24, 2015), <http://blog.tenthamendmentcenter.com/2015/02/north-dakota-houses-passes-bill-to-stop-warrantless-drone-spying-74-19/>.

<sup>45</sup> See *supra* notes 41, 42, 44.

<sup>46</sup> For example, one ACLU advocate acknowledged that “ideally, we would love to see broad regulations that cover all surveillance technologies, whether it is GPS, or phone tracking, or what have you. But if you go to state legislatures—and we have our lobbyists in state legislatures—and try and put forth a very, very broad surveillance bill like that right now, it’s not going to go anywhere. We’re fighting a large-scale war here over surveillance and privacy, and right now, we have an opportunity to get in place some rules around drones because there is so much public interest and fascination with drones. And so, we are pushing forward on that front.” *RadioTimes with Marty Moss-Coane: The Rise of Domestic Drones*, (Aug. 25, 2014) at 42:30, <http://whyy.org/cms/radiotimes/2014/08/25/the-rise-of-domestic-drones/>.

<sup>47</sup> STANLEY & CRUMP, *supra* note 22, at 1 (“[M]anned aircraft are expensive to purchase, operate and maintain, and this expense has always imposed a natural limit on the government’s aerial surveillance capability. . . . The prospect of cheap, small, portable flying video surveillance machines threatens to eradicate existing practical limits on aerial monitoring and allow for pervasive surveillance . . .”).

drones are cheaper to operate, the drones most law enforcement agencies can afford are currently far less capable than their manned counterparts (oftentimes, these drones are small remote-controlled helicopters or airplanes, capable of a flight time of less than one hour).<sup>48</sup> With that said, the surveillance equipment that can be placed on these drones is advancing rapidly. Although size and payload limitations today generally mean that this equipment will be far less intrusive than that which can be mounted to manned aircraft,<sup>49</sup> the pace of evolution in the development of technology suggests that reformers should focus not only on collection, but also on use and retention.

Technology is no doubt advancing at a rapid pace, but the commonly used term “unmanned aircraft” is presently misleading as there are no systems available now to law enforcement that can conduct fully autonomous operations without a human operator directing surveillance activities.<sup>50</sup> Full autonomy of this type, with automated surveillance is likely more than a decade away.<sup>51</sup> In fact, the FAA’s proposed rules for drones require any autonomous operations to be conducted within the visual line of sight of the operator,<sup>52</sup> meaning those operations are not truly autonomous; rather, they are more akin to driving a car using cruise control because the operator must be present. The implication of those proposed regulations and the state of technological development is that, for at least the next few years, a

---

<sup>48</sup> See, e.g., Erika Aguilar, *LAPD Gets Two Free Draganflyer Drones from Seattle Police*, 89.3 KPCC (May 31, 2014), <http://www.scp.org/news/2014/05/31/44468/lapd-gets-two-free-draganflyer-drones-from-seattle/> (discussing dispute over Draganflyer drones, which “weigh about 3.5 pounds each with a still and video camera, thermal vision capabilities for night vision, and a 20-minute battery life”); Christine Clarridge, *Police Department Demonstrates New Drone, to Help Allay Concerns*, SEATTLE TIMES, <http://www.seattletimes.com/seattle-news/police-department-demonstrates-new-drone-to-help-allay-concerns/> (last updated Apr. 28, 2012, 9:23 AM) (discussing 3.5-pound drone with battery life of less than ten minutes that can only carry up to thirty-five ounces).

<sup>49</sup> See Chris Johnston, *Meeting the Design Challenges for Imaging Payloads on Small UAVs*, LASER FOCUS WORLD, Apr. 2013, at 30, <http://www.laserfocusworld.com/articles/print/volume-49/issue-04/features/defense---security--meeting-the-design-challenges-for-imaging-pa.html> (discussing how small size restricts payloads and is a challenge for design engineers).

<sup>50</sup> McNEAL, *supra* note \*, at 3; see also Kelly Greeling, *Autonomous Robots in Law Enforcement: Future Legal and Ethical Issues 3* (Dec. 18, 2012) (unpublished manuscript), [http://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1407&context=gs\\_rp](http://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1407&context=gs_rp).

<sup>51</sup> 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/>.

<sup>52</sup> See NPRM, *supra* note 8, at 9546, 9562. The proposed FAA rules require that the unmanned aircraft remain within the operator’s visual line of sight, meaning that the drone “must remain close enough to the operator for the operator to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses.” *Id.* at 9546.

human operator will need to be present and within a very short distance of any drone if government surveillance activity is to take place.<sup>53</sup> Thus, in almost all instances of state or local law enforcement usage, drones will be less capable than manned aerial surveillance platforms, and while the platform is cheaper, the personnel costs will not be eliminated, as an officer will still be required to operate the drone.

Admittedly, federal law enforcement agencies and the military possess very sophisticated systems, but local law enforcement agencies are unlikely to be able to afford the highly sophisticated multimillion dollar systems like those used for surveillance on battlefields.<sup>54</sup> Those systems (both the aircraft and the ground control station) are more expensive than manned helicopters, require a ground crew to launch and recover the aircraft, and necessitate both a pilot and a camera operator.<sup>55</sup> Despite these facts and the near certainty that, in the short run, drones will not be as sophisticated as some fear, the legislation being advanced in many states is explicitly directed at drone technology rather than at surveillance practices.<sup>56</sup> The concentration of scholars, advocates, and legislators has been sorely misdirected. Focusing

---

<sup>53</sup> Of course, the large Predator- and Reaper-type drones that the U.S. military and Customs and Border Protection operate are not governed by the NPRM (which applies to small unmanned aircraft systems). See *id.* at 9546. However, those large systems are not the subject of this Article, as they are so expensive and complex that they are simply not practicable for state and local government use. See *infra* note 55 and accompanying text. Furthermore, if the federal government wants to provide state and local governments with a drone, it will need to comply with the President's Executive order on privacy. See Drone Privacy Memo, *supra* note 11.

<sup>54</sup> See, e.g., *MQ-9 Reaper*, U.S. AIR FORCE (Sept. 23, 2015), <http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104470/mq-9-reaper.aspx> (noting that four Reaper "remotely piloted aircraft[s]" with sensors, ground control station, and "Predator Primary satellite link" cost \$64.2 million in fiscal year 2015 dollars); Patrick Tucker, *White House Wants More Reaper Drones to Fight ISIS*, DEFENSE ONE (Feb. 2, 2015), <http://www.defenseone.com/technology/2015/02/white-house-wants-more-reaper-drones-fight-isis/104340/> (noting that Reapers "cost about \$14 million apiece").

<sup>55</sup> McNEAL, *supra* note \*, at 3; see also David Axe, *Air Force Drone Crews Got So Demoralized That They Booed Their Commander*, MEDIUM: WAR IS BORING (Sep. 29, 2014), <https://medium.com/war-is-boring/air-force-drone-crews-got-so-demoralized-that-they-booed-their-commander-cfd455fea40f> ("Fifty-nine people launch, land and repair the Predators at airfields near the actual combat zones . . . . Forty-five [combat air patrol] members live and work at an air base in the United States, flying the drones via Ku-band satellite."); Keith Wagstaff, *Eyes in the Sky: Are Pricey Border Patrol Drones Worth the Money?*, NBC NEWS (July 13, 2014, 4:02 PM), <http://www.nbcnews.com/storyline/immigration-border-crisis/eyes-sky-are-pricey-border-patrol-drones-worth-money-n153696> ("Predator drones are not cheap. They take a crew of between five to eight people—plus maintenance staff—to operate, coming out to about \$3000 an hour to fly. That is after the initial \$18 million price tag.").

<sup>56</sup> See generally *RadioTimes with Marty Moss-Coane: The Rise of Domestic Drones*, *supra* note 46.

reforms on the technology will not prevent privacy harms; rather, attention should be on what is collected, for how long, and how that information is handled.<sup>57</sup>

### C. *Privacy Executive Order*

Is there room for the federal government to act on matters related to privacy? There is, but the prospects for reform are dim, as repeated efforts to craft federal legislation have been rejected in favor of leaving privacy up to the states. Rather than directing the FAA to promulgate regulations to address privacy, the President instead issued an Executive order, styled as an Executive memorandum.<sup>58</sup> That Memorandum directed the federal government to create standards for how it will address the privacy issues associated with drones.<sup>59</sup> Under the order, federal agencies and some recipients of federal funds will have one year to publish their plans to implement the President's policies.<sup>60</sup>

The President's Memorandum acknowledges that drones "may play a transformative role in fields as diverse as urban infrastructure management, farming, public safety . . . and disaster response."<sup>61</sup> In addition, it states that drones are a lower-cost alternative to manned aircraft and can reduce risks to human life.<sup>62</sup> The President's directive promises to take account of "the privacy, civil rights, and civil liberties concerns these systems may raise."<sup>63</sup> The Memorandum segments federal drone operations from privately operated drones and leaves

---

<sup>57</sup> See *infra* Part III; see also Hillary Schaub, *How to Maximize the Benefits of Robots*, BROOKINGS INST.: TECHTANK (Sept. 22, 2014, 7:30 AM), <http://www.brookings.edu/blogs/techtank/posts/2014/09/21-robot-better-future-schaub> ("Lawmakers should focus on harms and not technologies. Drones should be treated the same as a helicopter or a person using binoculars on a hill. Technologies like geofencing and auto-redaction could allow drones to protect privacy even better than human surveillance.").

<sup>58</sup> Drone Privacy Memo, *supra* note 11. On the subtle differences between an Executive order and other forms of Executive action, see JOHN CONTRUBIS, CONG. RESEARCH SERV., 95-722 A, EXECUTIVE ORDERS AND PROCLAMATIONS 20 (1999) ("Another executive tool which has raised many questions is the presidential memoranda. Although they possess a different title than executive orders, it appears as though these instruments are very much alike. Both are undefined, written instruments by which the President directs, and governs actions by, Government officials and agencies. They differ in that executive orders must be published in the Federal Register whereas presidential memoranda are similarly published only if the President determines that they have 'general applicability and legal effect.'").

<sup>59</sup> See Drone Privacy Memo, *supra* note 11.

<sup>60</sup> *Id.*

<sup>61</sup> *Id.*

<sup>62</sup> *Id.*

<sup>63</sup> *Id.*

the matter of state- and local-operated drones (except those purchased with federal funds) to be addressed by the states.<sup>64</sup>

### *1. Rules for Federal Government Drone Operations*

The President's order requires agencies to implement the guidelines below and inform the public about how to access their policies by February 15, 2016.<sup>65</sup> The Memorandum requires federal agencies to examine their drone policies prior to the adoption of new drone technology and at least every three years thereafter.<sup>66</sup> The Memorandum notes that drones must only be used in a manner consistent with the Constitution, federal law, and other applicable regulations and policies.<sup>67</sup> It also reaffirms that individuals have the right to seek access to and amendment of records associated with drone usage.<sup>68</sup>

The President's Memorandum also created new requirements for collection of information by drones, mandating that agencies only collect information "to the extent that such collection or use is consistent with and relevant to an authorized purpose."<sup>69</sup> Information collected by drones "that is not maintained in a system of records covered by the Privacy Act shall not be disseminated outside of the agency unless dissemination is required by law, or fulfills an authorized purpose and complies with agency requirements."<sup>70</sup> If information collected using drones contains PII, that information "shall not be retained for more than 180 days unless retention of the information is determined to be necessary to an authorized mission of the retaining agency, is maintained in a system of records covered by the Privacy Act, or is required to be retained for a longer period by any other applicable law or regulation."<sup>71</sup>

To address civil liberties, the Memorandum mostly references existing laws.<sup>72</sup> Specifically, it calls on agencies to ensure they have policies to prohibit collection, use, retention, or dissemination of data in a manner that would violate the First Amendment or would illegally discriminate based on protected categories like ethnicity, race,

---

<sup>64</sup> *See id.*

<sup>65</sup> *Id.*

<sup>66</sup> *Id.*

<sup>67</sup> *Id.*

<sup>68</sup> *Id.*

<sup>69</sup> *Id.*

<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

<sup>72</sup> *See id.*



and gender, among others.<sup>73</sup> The Memorandum also requires agencies to ensure they have in place a means to “receive, investigate, and address . . . privacy, civil rights, and civil liberties complaints.”<sup>74</sup>

Moreover, the President’s Memorandum contemplates significant oversight and accountability measures that must accompany any increased use in drone technology. For example, agencies will be required to ensure their oversight procedures including audits or assessments, comply with existing policies and regulations. Federal government personnel and contractors who work on drone programs will require rules of conduct and training, and procedures will need to be implemented for reporting suspected cases of misuse or abuse of drone technologies.”<sup>75</sup>

Finally, in a passage particularly relevant to this Article, the Memorandum addresses drones shared with state and local governments, those drones purchased with federal funds, and information gathered by drones that is shared with others.<sup>76</sup> It further states that such operations must comply with Executive orders and other applicable laws and regulations.<sup>77</sup> “If agencies authorize the use of drones in response to requests from Federal, State, local, tribal or territorial government operations, it will need to be conducted pursuant to established policies and procedures.”<sup>78</sup> State, local, tribal or territorial government recipients of federal grant funding for the purchase or use of drones will also need to “have in place policies and procedures to safeguard individuals’ privacy, civil rights, and civil liberties prior to expending such funds.”<sup>79</sup> These are relatively minor changes that do very little to impact most drone operations, as most were likely already complying with federal laws and regulations (which, as the subsequent sections of this Article point out, impose very few restrictions on aerial surveillance).<sup>80</sup>

On transparency, the Executive Memorandum takes measures to provide the public with greater information about the federal government’s use of drones.<sup>81</sup> The memorandum “attempts to balance pri-

---

<sup>73</sup> *Id.*

<sup>74</sup> *Id.*

<sup>75</sup> *Id.*

<sup>76</sup> Drone Privacy Memo, *supra* note 11; McNeal, *supra* note 11.

<sup>77</sup> Drone Privacy Memo, *supra* note 11; McNeal, *supra* note 11.

<sup>78</sup> McNeal, *supra* note 11; *see* Drone Privacy Memo, *supra* note 11, at 3.

<sup>79</sup> Drone Privacy Memo, *supra* note 11; McNeal, *supra* note 11.

<sup>80</sup> *See infra* Part II.D.

<sup>81</sup> Drone Privacy Memo, *supra* note 11; McNeal, *supra* note 11.

vacy with national security and law enforcement interests.”<sup>82</sup> Agencies must “provide notice to the public regarding where [in the national airspace] the agency’s [drones] are authorized to operate.”<sup>83</sup> Agencies are also told to “keep the public informed about” their drone programs and any “changes that would significantly affect privacy, civil rights, or civil liberties.”<sup>84</sup> Each year, agencies must also provide “a general summary of” their drone operations for the previous fiscal year.<sup>85</sup> “That summary must include ‘a brief description of [the] types or categories of missions flown, and the number of times the agency provided assistance to other agencies, or State, local, tribal, or territorial governments.’”<sup>86</sup>

## 2. *Process for Crafting Rules for Private Drones*

As part of the President’s directive, the Department of Commerce’s National Telecommunications and Information Administration (“NTIA”) was tasked with initiating a process for creating privacy, accountability, and transparency rules for commercial and private uses of drones.<sup>87</sup> The process was explicitly designed to “not focus on law enforcement or other noncommercial governmental use.”<sup>88</sup> The process for crafting rules typically begins with a notification and a request for public comments regarding a privacy blueprint. Following a sixty-day comment period, a notice will be published regarding a series of multi-stakeholder meetings. Those stakeholder meetings are designed to create a set of consensus-based voluntary rules that may take up to a year to draft. Because NTIA does not have the regulatory authority to impose their rules on individuals or organizations, the rules are considered merely voluntary.<sup>89</sup>

## II. AIRSPACE RIGHTS, TECHNOLOGICAL DISRUPTION, AND THE CURRENT STATE OF AERIAL SURVEILLANCE LAW

To understand how emergent the issue of drones and aerial surveillance is, one need only look at the Westlaw database of law review articles: prior to 2008, only one law review article addressed the legal

---

<sup>82</sup> McNeal, *supra* note 11.

<sup>83</sup> Drone Privacy Memo, *supra* note 11; McNeal, *supra* note 11.

<sup>84</sup> Drone Privacy Memo, *supra* note 11; McNeal, *supra* note 11.

<sup>85</sup> Drone Privacy Memo, *supra* note 11; McNeal, *supra* note 11.

<sup>86</sup> McNeal, *supra* note 11 (quoting Drone Privacy Memo, *supra* note 11).

<sup>87</sup> *Id.*; see Drone Privacy Memo, *supra* note 11.

<sup>88</sup> McNeal, *supra* note 11 (quoting Drone Privacy Memo, *supra* note 11).

<sup>89</sup> *Id.*

issues associated with integrating drones into the national airspace.<sup>90</sup> Only recently have scholars begun to address the topic, but the disruptive nature of drones and the permissiveness of the FAA's proposed regulations will likely prompt an avalanche of legal scholarship in the years to come. This Section addresses the disruption brought about by drones and situates that disruption within the current state of aerial surveillance law and airspace rights.

Although this Article focuses on the future and new technology, history is directly relevant to this emergent legal and policy debate because, for the past sixty-eight years, the law governing property rights and airspace—which is critically important to determining how drones may operate—has sat largely undisturbed.

In 1946, the Supreme Court declared in *United States v. Causby*<sup>91</sup> that “airspace is a public highway” and carved out a common area in the atmosphere known as “navigable airspace” through which aircraft can fly without interfering with the rights of landowners below.<sup>92</sup> At the same time, the Court provided landowners with a right to exclude low-flying aircraft from their property, stating “if the landowner is to have full enjoyment of the land, he must have exclusive control of the immediate reaches of the enveloping atmosphere.”<sup>93</sup> This granting of a right to travel through airspace, while at the same time reserving landowners' rights in the air immediately above their land, was a simple compromise solution that has served America well for nearly seventy years. Since *Causby*, the law and legal scholarship related to airspace rights has sat mostly undisturbed, and the four decades of legal wrangling that preceded the *Causby* case have been relegated to the realm of interesting historical background.<sup>94</sup>

With the emergence of drones, understanding the rights of property owners versus private and government drone operators has become increasingly important. The legal system at the turn of the century struggled to handle the emergence of airplanes, and the modern airspace system is largely the byproduct of the compromise solu-

---

<sup>90</sup> The author performed a word search in Westlaw for “adv: unmanned /2 aircraft & national airspace & DA(bef 01-01-2008).” See also Mark Edward Peterson, *The UAV and the Current and Future Regulatory Construct for Integration into the National Airspace System*, 71 J. AIR L. & COM. 521 (2006).

<sup>91</sup> *United States v. Causby*, 328 U.S. 256 (1946).

<sup>92</sup> *Id.* at 264. For interesting background on airspace rights at the turn of the century, see STUART BANNER, *WHO OWNS THE SKY? THE STRUGGLE TO CONTROL AIRSPACE FROM THE WRIGHT BROTHERS ON* (2008).

<sup>93</sup> *Causby*, 328 U.S. at 264.

<sup>94</sup> See, e.g., BANNER, *supra* note 92.

tion created by the U.S. Supreme Court in *Causby*. That compromise could endure, so long as aircraft did not operate low enough to interfere with the property rights of persons below—the exact place where drones will likely be operating.

#### A. *The Significance of Vantage Points*

The small, unmanned aircraft destined for integration into the national airspace as a result of the FAA Modernization and Reform Act of 2012 are specifically designed to operate at low altitudes where they provide their greatest economic value.<sup>95</sup> This reality will raise serious questions about government use of drones because a threshold question for the Fourth Amendment analysis under *California v. Ciraolo*<sup>96</sup> and *Florida v. Riley*<sup>97</sup> is whether an observation was made from a lawful vantage point.<sup>98</sup> Thus, the fact that realtors are already using drones to create aerial videos and photographs of homes, using drones equipped with GoPro-type cameras at roughly thirty feet,<sup>99</sup> (the height of an average two-story home) suggests a law enforcement activity from the same vantage point would not violate the Fourth Amendment. That is especially true when one considers that realtors may traverse over the low-altitude airspace of neighbors, suggesting it would be unreasonable for an individual to expect privacy from such low-altitude observations if similarly conducted by the police. Farmers also want to use drones to enhance their crop yields, minimize the use of pesticides, and conserve water.<sup>100</sup> Those farmers will likely fly well below the navigable airspace for manned aircraft, and the FAA claims the authority to regulate the farmer's airspace down to millimeters above the farmer's property.<sup>101</sup> If the public navigable airspace

---

<sup>95</sup> E.g., Rakesh Sharma, *Growing the Use of Drones in Agriculture*, FORBES (Nov. 26, 2013, 3:15 PM), <http://www.forbes.com/sites/rakeshsharma/2013/11/26/growing-the-use-of-drones-in-agriculture/> (describing advantages of low-altitude drone flights for farmers).

<sup>96</sup> *California v. Ciraolo*, 476 U.S. 207 (1986).

<sup>97</sup> *Florida v. Riley*, 488 U.S. 445 (1989).

<sup>98</sup> See *id.* at 449; *Ciraolo*, 476 U.S. at 213. *Ciraolo* and *Riley* are also discussed *infra* Section B.

<sup>99</sup> See Winnie Hu, *Still Unconvinced, Home Buyer? Check Out the View from the Drone*, N.Y. TIMES: APPRAISAL (Dec. 23, 2013), [http://www.nytimes.com/2013/12/24/nyregion/still-unconvinced-home-buyer-check-out-the-view-from-the-drone.html?\\_r=0](http://www.nytimes.com/2013/12/24/nyregion/still-unconvinced-home-buyer-check-out-the-view-from-the-drone.html?_r=0).

<sup>100</sup> See Douglas Kennedy, *Farmers Eye Drones As Key to Future of Agriculture*, FOXNEWS.COM (Feb. 27, 2015), <http://www.foxnews.com/tech/2015/02/27/farmers-eye-drones-as-key-to-future-agriculture/>; Sharma, *supra* note 95.

<sup>101</sup> Gregory S. McNeal, *The Federal Government Thinks Your Backyard Is National Airspace and Toys Are Subject to FAA Regulations*, FORBES (Nov. 18, 2014, 12:47 PM), <http://www.forbes.com/sites/gregorymcneal/2014/11/18/the-federal-government-thinks-your-backyard-is-national-airspace-and-toys-are-subject-to-faa-regulations/>.

extends down to millimeters above the farmer's land, does that make it a public thoroughfare through which anyone can fly over the farmer's property? If so, then presumably law enforcement can fly over the farmer's property and use the information gathered from that lawful vantage point in court against the farmer (perhaps to enforce environmental regulations).<sup>102</sup> To add complexity to the analysis, the farmer may have rights under his state constitution, and those rights may be in conflict with federal regulations allowing low-altitude flights over his property.<sup>103</sup> Rather than settling these questions and others in the aviation cases the Supreme Court heard at the beginning of the twentieth century, the Court merely avoided them. At the turn of the twenty-first century, the emergence of drones will cause legal scholars to revisit these issues, and the following Sections will lay the groundwork for understanding the surveillance law and airspace rights issues that are essential for addressing emergent privacy concerns.

*B. Ciraolo, Dow, and Riley*

Aerial observations of the curtilage of a home are generally not prohibited by the Fourth Amendment, so long as the government is conducting the surveillance from public navigable airspace, in a non-physically intrusive manner, and the government conduct does not reveal intimate activities traditionally associated with the use of the home.<sup>104</sup> The U.S. Supreme Court addressed the issue of aerial surveillance in a series of cases in the late 1980s.

In *California v. Ciraolo*, the Supreme Court held that a warrantless aerial observation of a backyard, "visible to the naked eye," did not violate the Fourth Amendment.<sup>105</sup> In *Ciraolo*, the police received a tip that someone was growing marijuana in the backyard at Ciraolo's

---

<sup>102</sup> The EPA, for example, has been conducting "pollution-control flights" over Nebraska ranches. *EPA Planes Spying on Ranchers? Lawmakers Want Answers*, NBC NEWS (May 31, 2012, 3:12 PM), [http://usnews.nbcnews.com/\\_news/2012/05/31/11993693-epa-planes-spying-on-ranchers-lawmakers-want-answers?lite](http://usnews.nbcnews.com/_news/2012/05/31/11993693-epa-planes-spying-on-ranchers-lawmakers-want-answers?lite).

<sup>103</sup> For example, the California Constitution explicitly provides for a right to privacy. CAL. CONST. art. I, § 1. The Nevada Constitution provides residents of that state with airspace rights extending up to 500 feet above their property. See *McCarran Int'l Airport v. Sisolak*, 137 P.3d 1110, 1120 (Nev. 2006); see also *id.* at 1119 ("Therefore, the airspace above required minimum altitudes for flight, as established in federal regulations, is in the public domain, while the ownership of the airspace below such minimum altitudes is vested in the owner of the subjacent land, who is entitled to compensation for flights invading that airspace when taken by the government.").

<sup>104</sup> See *Florida v. Riley*, 488 U.S. 445, 449–50, 452 (1989); *California v. Ciraolo*, 476 U.S. 207, 213–15 (1986).

<sup>105</sup> *Ciraolo*, 476 U.S. at 215.

home.<sup>106</sup> A police officer attempted to observe what was growing, but his observations were obscured by a six-foot high outer fence and a ten-foot high inner fence.<sup>107</sup> The officer, suspicious that the fences might be intended to hide the growth of marijuana, obtained a private plane and flew over the backyard of *Ciraolo*'s property at an altitude of 1000 feet.<sup>108</sup> That altitude was within the FAA's definition of public navigable airspace.<sup>109</sup> The Supreme Court found that this was not a search and therefore was not prohibited by the Fourth Amendment.<sup>110</sup> In so finding, Chief Justice Burger stated that in erecting a ten-foot fence, *Ciraolo* manifested "his own subjective intent and desire to maintain privacy as to his unlawful agriculture pursuits," but that his "intent and desire" did not amount to an expectation of privacy that society was prepared to deem reasonable.<sup>111</sup> The Court noted that the fence "might not shield these plants from the eyes of a citizen or a policeman perched on the top of a truck or a two-level bus."<sup>112</sup> Accordingly, it was "not entirely clear" whether *Ciraolo* maintained "a subjective expectation of privacy from *all* observations of his backyard," or only from ground-level observations.<sup>113</sup> The Court believed that it was unreasonable for *Ciraolo* to expect privacy in his backyard when a routine overflight or an observation "by a power company repair mechanic on a pole overlooking the yard" would reveal exactly what the police discovered in their overflight.<sup>114</sup>

At the same time that *Ciraolo* was decided, the Court held in *Dow Chemical Co. v. United States*<sup>115</sup> that the use of an aerial mapping camera to photograph an industrial manufacturing complex from navigable airspace similarly does not require a warrant under the Fourth Amendment.<sup>116</sup> In *Dow Chemical*, the Supreme Court did acknowledge that the use of technology might change the Court's inquiry, stating "surveillance of private property by using highly sophisticated surveillance equipment not generally available to the public, such as satellite technology, might be constitutionally proscribed absent a

---

<sup>106</sup> *Id.* at 209.

<sup>107</sup> *Id.*

<sup>108</sup> *Id.*

<sup>109</sup> *Id.* at 209, 213.

<sup>110</sup> *See id.* at 214–15.

<sup>111</sup> *Id.* at 211, 214.

<sup>112</sup> *Id.* at 211.

<sup>113</sup> *Id.* at 212.

<sup>114</sup> *Id.* at 214–15.

<sup>115</sup> *Dow Chem. Co. v. United States*, 476 U.S. 227 (1986).

<sup>116</sup> *Id.* at 239.

warrant.”<sup>117</sup> The Court, however, dismissed this notion, stating that “[a]ny person with an airplane and an aerial camera could readily duplicate” the photographs at issue.<sup>118</sup> In short, the Court stated, “taking of aerial photographs of an industrial plant complex from navigable airspace is not a search prohibited by the Fourth Amendment.”<sup>119</sup>

The thematic parallels between *Ciraolo* and *Dow* are important, and it is important to restate the facts of *Ciraolo* here to ensure a close comparison of the cases. In *Ciraolo*, the Court held that the defendant did not have a reasonable expectation of privacy in his backyard despite having erected fences to obscure the yard from view.<sup>120</sup> The Court reasoned that while the defendant shielded his yard from the view of those on the street, other observations from a truck or a two-level bus might have allowed a person to see into his yard.<sup>121</sup> Continuing, the Court stated, “[t]he 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.”<sup>122</sup> Dismissing the defendant’s efforts to protect his privacy by erecting a fence, the Court said that “the mere fact that an individual has taken measures to restrict some views of his activities [does not] preclude *an officer’s observations from a public vantage point where he has a right to be and which renders the activities clearly visible.*”<sup>123</sup> Despite the fact that the police flew a small commercial airplane over Ciraolo’s land to make their observation, that observation took place from “public navigable airspace in a physically nonintrusive manner.”<sup>124</sup> From these facts, the Court noted that while the defendant may have expected privacy in his backyard, privacy from aerial viewing was not one that society was prepared to deem reasonable.<sup>125</sup> The Court stated, “[i]n an age where private and commercial flight in the public airways is routine, it is unreasonable for respondent to expect that his marijuana plants were constitutionally protected from being observed with the naked eye from an altitude of 1,000 feet.”<sup>126</sup>

---

<sup>117</sup> *Id.* at 238.

<sup>118</sup> *Id.* at 231.

<sup>119</sup> *Id.* at 239.

<sup>120</sup> *California v. Ciraolo*, 476 U.S. 207, 214 (1986).

<sup>121</sup> *Id.* at 211.

<sup>122</sup> *Id.* at 213.

<sup>123</sup> *Id.* (emphasis added).

<sup>124</sup> *Id.* (citation omitted).

<sup>125</sup> *Id.* at 214.

<sup>126</sup> *Id.* at 215.

Shortly after *Ciraolo* and *Dow Chemical*, the Supreme Court analyzed the use of helicopters for aerial surveillance. In *Florida v. Riley*, the police flew a helicopter over Riley's land and observed marijuana plants growing in Riley's greenhouse.<sup>127</sup> The *Riley* Court noted that "[t]he Fourth Amendment simply does not require the police traveling in the public airways at this altitude [400 feet] to obtain a warrant in order to observe what is visible to the naked eye."<sup>128</sup> The *Riley* Court found that the rule of *Ciraolo* controlled.<sup>129</sup> Riley, just like *Ciraolo*, took measures that "protected against ground-level observation," but "the sides and roof of his greenhouse were left partially open," just as the sky above *Ciraolo*'s property allowed one to look directly down into his yard.<sup>130</sup>

The Court in *Riley* found that "what was growing in the greenhouse was subject to viewing from the air."<sup>131</sup> The police conduct in *Riley* was acceptable because the police were flying in public navigable airspace, "no intimate details connected with the use of the home or curtilage were observed, and there was no undue noise, and no wind, dust, or threat of injury."<sup>132</sup> The Court also explained that "[a]ny member of the public could legally have been flying over Riley's property in a helicopter at the altitude of 400 feet and could have observed Riley's greenhouse. The police officer did no more."<sup>133</sup> In an important passage, Justice O'Connor—concurring in the judgment—noted that "public use of altitudes lower than [400 feet]—particularly public observations from helicopters circling over the curtilage of a home—may be sufficiently rare that police surveillance from such altitudes would violate reasonable expectations of privacy, despite compliance with FAA air safety regulations,"<sup>134</sup> suggesting that more frequent low-altitude flights might impact whether it is reasonable for one to expect privacy from aerial observations.

Taken together, *Riley*, *Dow*, and *Ciraolo* teach that the law, for at least the last twenty-five years, has allowed the police to fly aircraft over private property, backyards, factory farms, industrial plants, and any other place where the average citizen may fly a Cessna or a helicopter. The police may make observations from the air, just like a

---

<sup>127</sup> *Florida v. Riley*, 488 U.S. 445, 448 (1989).

<sup>128</sup> *Id.* at 450 (quoting *Ciraolo*, 476 U.S. at 215).

<sup>129</sup> *Id.* at 449.

<sup>130</sup> *Id.* at 450.

<sup>131</sup> *Id.*

<sup>132</sup> *Id.* at 451–52.

<sup>133</sup> *Id.* at 451.

<sup>134</sup> *Id.* at 455 (O'Connor, J., concurring).



person on a commercial flight inbound to an airport can look down and observe the yards of people below, and just like a utility worker on a pole can look down into an adjacent yard. Armed with information gained from lawful vantage points like those described above, the police can use that information to get a warrant to go in on foot and investigate what was previously observed without a warrant from a lawful vantage point. For more than two decades, the police have not been required to turn a blind eye to evidence of criminality merely because they observed it from the air. The consequences of this rule are that, absent some substantial changes to aerial surveillance law, or a set of legislative rules to restrict aerial surveillance, the police will not be required to ignore evidence of criminality merely because they witness the evidence through the eyes of a drone. But, the drones that law enforcement are likely to purchase will not operate at the altitudes where police made their observations in *Riley* (400 feet) and *Ciraolo* (1000 feet); they will operate at much lower altitudes, suggesting that there is some uncertainty in how aerial surveillance law will evolve. That uncertainty suggests that legislatively directed reforms may be preferable to a process of common law adjustment.

### C. Low-Altitude Airspace Rights

Low-altitude operation provides an opening point for a discussion of limited legal reforms. As the preceding Section indicated, the Supreme Court's aerial surveillance jurisprudence makes reference to "public navigable airspace" or observations from "a public vantage point where [an officer] has a right to be."<sup>135</sup> By tying the Fourth Amendment's protections to the location in airspace from which the surveillance was conducted, the Supreme Court has left open the possibility that low-altitude surveillance may not in fact violate the Fourth Amendment. That is because the use of drones at low altitudes, the FAA's NPRM, and FAA interpretations of its own regulations all suggest that the public navigable airspace may extend to the ground.<sup>136</sup> Moreover, the drones that law enforcement is most likely to acquire and operate are most effective at altitudes *below* 500 feet. Drones are

---

<sup>135</sup> *California v. Ciraolo*, 476 U.S. 207, 213 (1986).

<sup>136</sup> See Gregory S. McNeal, *California's Drone Trespass Bill Is Great, Except for One Fatal Flaw*, FORBES (Feb. 16, 2015, 2:12 PM), <http://www.forbes.com/sites/gregorymcneal/2015/02/16/californias-drone-trespass-bill-is-great-except-for-one-fatal-flaw/>; see also NPRM, *supra* note 8, at 9546–47 (establishing 500 feet as the *ceiling* for commercial drone flights with the floor being ground level); Interpretation of the Special Rule for Model Aircraft, 79 Fed. Reg. 36,172, 36,172 (June 25, 2014) (establishing 400 feet as the *ceiling* for recreational drone flights, with the floor being ground level).

thus poised to disrupt aerial surveillance law by operating in airspace that heretofore has not been the subject of caselaw or statutes.

To understand this emergent legal issue, it is necessary to circle back to the *Causby* case, which was briefly discussed earlier. In the 1946 case *United States v. Causby*, the Supreme Court analyzed the airspace rights of landowners.<sup>137</sup> The *Causby* case involved chicken farmers whose farm was adjacent to a small municipal airport that the U.S. military began using during World War II.<sup>138</sup> The military flights were so low (eighty-three feet above the land and sixty-three feet above the Causbys' barn) that the Causbys' chickens were frightened by each overflight, and as a result flew into the wall of their chicken coop and died.<sup>139</sup> The Causbys sued the federal government claiming that the government's flights constituted a Fifth Amendment taking.<sup>140</sup>

The Supreme Court's opinion, authored by Justice William Douglas, began by analyzing the *ad cælum* doctrine.<sup>141</sup> That doctrine had its roots in common law jurisprudence dating back centuries to Cino da Pistoia's declaration "[c]ujus est solum, ejus est usque ad cælum," which, translated means "[t]o whomsoever the soil belongs, he owns also to the sky."<sup>142</sup> The doctrine "assigned airspace rights based on ownership of the surface land situated immediately below the space," which consisted of "a column of airspace held by landowners . . . [that] theoretically extended indefinitely to the outer reaches of the heavens."<sup>143</sup>

Justice Douglas, analyzing the *ad cælum* doctrine quickly dispensed with it, stating that it had "no place in the modern world."<sup>144</sup> Rather, Justice Douglas said that a landowner owned "at least as much of the space above the ground as he can occupy or use in connection with the land."<sup>145</sup> If the government or any other party in-

---

<sup>137</sup> *United States v. Causby*, 328 U.S. 256 (1946).

<sup>138</sup> *Id.* at 258.

<sup>139</sup> *Id.* at 258–59.

<sup>140</sup> *Id.* at 258.

<sup>141</sup> *Id.* at 260–61.

<sup>142</sup> See Rule, *supra* note 5, at 166 (quoting BLACK'S LAW DICTIONARY 378 (6th ed. 1990)) (citing Stuart S. Ball, *The Vertical Extent of Ownership in Land*, 76 U. PA. L. REV. 631, 631 (1928)) (noting that the full maxim reads "*cujus est solum, ejus est usque ad cælum et ad inferos*"). Black's translates the full maxim: "to whomsoever the soil belongs, he owns also to the sky and to the depths." BLACK'S LAW DICTIONARY, *supra*, at 378 (emphasis added).

<sup>143</sup> Rule, *supra* note 5, at 166; see also BLACK'S LAW DICTIONARY, *supra* note 142, at 37 (6th ed. 1990) ("Literally, to heaven.").

<sup>144</sup> *Causby*, 328 U.S. at 261; see also BLACK'S LAW DICTIONARY, *supra* note 142, at 37 (citing *Causby* as rejecting the doctrine).

<sup>145</sup> *Causby*, 328 U.S. at 264.

trudes into that space, such intrusions should be treated “in the same category as invasions of the surface.”<sup>146</sup> Such invasions could, in the right circumstances, be treated as a trespass and on the facts presented by *Causby*, the flights could be considered a compensable taking.<sup>147</sup> The facts of *Causby* importantly involved flights that were “so low and so frequent as to be a direct and immediate interference with the enjoyment and use of the land.”<sup>148</sup> The *Causby* opinion thus created two types of airspace: the public navigable airspace, a “public highway” in which the landowner could not exclude aircraft from flying; and the airspace below that which extends downward to the surface, in which landowners held some right to exclude aircraft, and into which intrusions would be treated as if they were intrusions upon the land.<sup>149</sup> For our purposes, that means that a law enforcement flight by a drone at a low enough altitude (in which a landowner could otherwise exclude) would be akin to the officer walking on the landowner’s property.

This discussion brings into focus the possibility that a landowner may exclude others from entering the low-altitude airspace above his property, and as such may exclude drones (whether government- or civilian-operated) from entering that airspace. But, if such rights in fact exist, at what altitude are such property rights triggered? Unfortunately, there is very little clarity on this point,<sup>150</sup> and the Court purposefully left the issue ambiguous.<sup>151</sup> The Supreme Court referred to this low-altitude airspace as the “immediate reaches” above the land into which intrusions would “subtract from the owner’s full enjoyment of the property.”<sup>152</sup>

The lack of clarity presents a significant issue of law and public policy, as the drones that law enforcement and citizens are most likely to operate are small planes and multicopters that are most effective when used below 500 feet. To understand the practical import of these developments, consider the Supreme Court’s opinion in *California v. Ciraolo*. Central to the Court’s holding there was the notion that government surveillance took place from a “public vantage

---

<sup>146</sup> *Id.* at 265.

<sup>147</sup> *See id.* at 261, 266–67.

<sup>148</sup> *Id.* at 266.

<sup>149</sup> *See* Rule, *supra* note 5, at 198, 208.

<sup>150</sup> *See id.* at 179 n.128 (“[S]ome jurisdictions have recognized rights in super-adjacent airspace above 500 feet . . .”).

<sup>151</sup> *See Causby*, 328 U.S. at 266 (“The airspace, apart from the immediate reaches above the land, is part of the public domain. We need not determine at this time what those precise limits are.”).

<sup>152</sup> *Id.* at 264–65.

point” where a police officer had “a right to be.”<sup>153</sup> But, if the officer in *Ciraolo* were to conduct that surveillance today with a drone he would likely not fly the drone up to 1000 feet; in fact, he would likely fly it just high enough above the landowner’s property to look down and observe the marijuana plants, likely under forty feet in altitude. Would such a flight violate the landowner’s reasonable expectation of privacy? To resolve that issue, a court would first need to determine if the observation took place from a “public vantage point.”<sup>154</sup> Answering that question would largely depend on how obscured the land was from other observations at the same altitude. It would also require that the landowner have a right to exclude the drone from flying over his property—after all, if any person with a drone bought on Amazon could fly over a neighbor’s backyard and observe evidence of illegality, the police would not be required to avert their eyes from evidence similarly observed by a law enforcement officer.<sup>155</sup> Of course, even if a landowner could exclude overflights, that alone would not prevent the officer from flying the drone above public land, such as the street, or over a neighbor’s property with permission.<sup>156</sup> In such a circumstance, the officer need only stand on the sidewalk and fly the drone to an altitude high enough to see into the landowner’s property. Whether a low-altitude aerial observation above public land to peer into private property would be considered a public vantage point, and therefore acceptable from a Fourth Amendment perspective, is similarly an open question.<sup>157</sup>

#### D. *Why Existing Law Won’t Protect Privacy*

The prior Sections set forth existing law, highlighting the ambiguities and significant questions that the increased use of drones by law

---

<sup>153</sup> *California v. Ciraolo*, 476 U.S. 207, 213 (1986).

<sup>154</sup> *See id.*; *Florida v. Riley*, 488 U.S. 445, 449 (1989).

<sup>155</sup> *California v. Greenwood*, 486 U.S. 35, 41 (1988) (“[T]he police cannot reasonably be expected to avert their eyes from evidence of criminal activity that could have been observed by any member of the public.”).

<sup>156</sup> *See id.* Or perhaps without permission. Because Fourth Amendment rights are personal, a trespass on a neighbor’s property would not trigger rights under the exclusionary rule for the non-neighbor target of surveillance unless such a trespass violated the target’s reasonable expectation of privacy. *See Rakas v. Illinois*, 439 U.S. 128, 133–34 (1978) (“Fourth Amendment rights are personal rights which, like some other constitutional rights, may not be vicariously asserted. A person who is aggrieved by an illegal search and seizure only through the introduction of damaging evidence secured by a search of a third person’s premises or property has not had any of his Fourth Amendment rights infringed.” (citations omitted)).

<sup>157</sup> Of course, if such observations became frequent occurrences, legislatures may want to similarly prohibit low-altitude observations over public land, not just above private property.

enforcement will raise. How might these open questions be resolved? Likely not in a way that protects the privacy rights of landowners. Recall that in *Riley*, the plurality relied on *Ciraolo*. But in a dissenting opinion in *Riley*, Justice Brennan presciently highlighted the problems that plagued the plurality's analysis. He wrote:

Imagine a helicopter capable of hovering just above an enclosed courtyard or patio without generating any noise, wind, or dust at all—and, for good measure, without posing any threat of injury. Suppose the police employed this miraculous tool to discover not only what crops people were growing in their greenhouses, but also what books they were reading and who their dinner guests were. Suppose, finally, that the FAA regulations remained unchanged, so that the police were undeniably “where they had a right to be.” Would today’s plurality continue to assert that “[t]he right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures” was not infringed by such surveillance? Yet that is the logical consequence of the plurality’s rule . . . .<sup>158</sup>

Analyzing this passage, Professor Troy Rule notes “[t]wenty-five years after *Riley*, law enforcement agencies can now easily purchase the very hypothetical ‘miraculous tool’ that Justice Brennan forebodingly described.”<sup>159</sup> Professor Rule is mostly right. Although it is not clear that *silent* devices can be “easily purchase[d]” today, the small drones that police are likely to purchase in the future may operate without creating noise, and while they do not yet have the lift capacity to carry cameras capable of seeing what books people are reading, we are at most a few years away from such capability.<sup>160</sup> Interestingly, in this passage, Justice Brennan was discussing manned aircraft,<sup>161</sup> and manned aircraft *presently* possess the capabilities he feared.<sup>162</sup> This suggests that reforms will need to go beyond merely excluding aircraft from conducting low-altitude aerial surveillance; rather, broader reforms to surveillance practices, specifically how long surveillance may

---

<sup>158</sup> *Riley*, 488 U.S. at 462–63 (Brennan, J., dissenting).

<sup>159</sup> Rule, *supra* note 5, at 174.

<sup>160</sup> See 5 *UAV Technologies for Police*, POLICEONE.COM (Apr. 10 2014), <http://www.police-one.com/police-products/investigation/video-surveillance/articles/7067279-5-UAV-technologies-for-police/>.

<sup>161</sup> See *Riley*, 488 U.S. at 463.

<sup>162</sup> See Kim Zetter, *NYPD Helicopter Views Faces from Miles Away*, WIRED (June 5, 2008, 9:03 AM), <http://www.wired.com/2008/06/nypd-helicopter/> (discussing helicopter with ability to “recognize a face from two miles away, peer inside a building from three to four miles away, and track a suspect car from 12 miles away”).

be conducted and what must be done with the data once gathered, are necessary components of any reform scheme.<sup>163</sup> While banning aerial surveillance absent a warrant may be a possibility, we have witnessed very few proposals seeking to ban the use of high-powered cameras mounted to helicopters or airplanes. Given the lack of interest in banning those capabilities from manned aircraft, it is difficult to see why banning drones (which do not yet possess such capabilities) is a rational policy choice. Nevertheless, if engineers can continue to increase the lift capacity of drones, and can miniaturize the superior technology already mounted on manned aircraft, drones may eventually possess the capabilities Justice Brennan feared. That is why this Article argues that it is prudent to legislate with an eye towards controlling aerial observations irrespective of whether they are from a drone or a manned platform.

The important takeaway from this review of airspace rights and aerial surveillance law is not the future observational capabilities of surveillance aircraft, but the locational capabilities drones currently possess, namely the ability to hover “just above an enclosed courtyard.”<sup>164</sup> It is at those lower altitudes that the drones law enforcement agencies can acquire today become most capable. Thus, defining “public navigable airspace” has become the critical piece in resolving the future of aerial surveillance and law enforcement. The FAA has resolved the question, defining the airspace from the ground up to 500 feet as public navigable airspace for drones.<sup>165</sup>

In light of this extension of the public navigable airspace down to ground level, state and local governments will need to act to define the rights of landowners in the airspace above their land. In so doing, state and local governments will answer many of the open questions regarding public vantage points and resolve open questions regarding the Fourth Amendment. This Article will address the reforms that state and local governments should adopt to deal with aerial surveillance, but first, the next Part will address why state and local governments should reject the call for a warrant requirement for drones.

---

<sup>163</sup> This Article makes this precise argument in the Reform Section, *infra* Part IV.

<sup>164</sup> *Riley*, 488 U.S. at 462.

<sup>165</sup> See NPRM, *supra* note 8, at 9562. The limit for manned aircraft is generally set at 500 feet or higher, with an exception for helicopter operations, for example. See *id.* at 9562–63.

### III. PRIVACY- AND WARRANT-BASED REFORM PROPOSALS

#### A. *Introduction to the Fight over Drones and Privacy*

A number of organizations and scholars have expressed concern over the possibility that thousands of drones will crowd the skies, armed with sophisticated cameras.<sup>166</sup> The ACLU, for example, has been quite vocal in its criticism, releasing a report that sets out its concerns over the prospect of intrusive aerial surveillance without proper safeguards.<sup>167</sup> To counter the threat of aerial surveillance, scholars and advocates have focused almost entirely on requiring warrants before law enforcement uses drones.<sup>168</sup> Such a mandate will do little to protect privacy from other forms of aerial surveillance, and “oftentimes will result in the grounding of drone technology in circumstances where law enforcement use of drones would be beneficial” and pose a minimal impact on privacy.<sup>169</sup> For example, in light of the Boston Marathon bombing, police may want to fly a drone above a marathon to ensure the safety of the public.<sup>170</sup> Under many proposed bills and enacted legislation, police would not be allowed to use a drone unless they had probable cause to believe a crime had been or was about to be committed.<sup>171</sup> What this means is that the police

---

<sup>166</sup> See, e.g., Stanley, *supra* note 9.

<sup>167</sup> See STANLEY & CRUMP, *supra* note 22, at 1.

<sup>168</sup> McNEAL, *supra* note \*, at 3.

<sup>169</sup> *Id.*

<sup>170</sup> See Maggie Clark, *Boston Bombings Show Future Use for Police Drones*, HUFFPOST POL. (May 1, 2013, 9:50 AM), [http://www.huffingtonpost.com/2013/05/01/boston-bombing-drones\\_n\\_3192694.html](http://www.huffingtonpost.com/2013/05/01/boston-bombing-drones_n_3192694.html) (noting that Boston Police Commissioner Edward F. Davis believed using drones at the 2014 Boston Marathon would be “a good idea”); McNEAL *supra* note \*, at 3.

<sup>171</sup> For example, Florida prohibits “law enforcement agenc[ies]” from using drones “to gather evidence or other information,” but makes an exception when the agency “first obtains a search warrant signed by a judge authorizing the use of a drone.” FLA. STAT. ANN. §§ 934.50(3), (4)(b) (West 2015). Similarly, in Utah, “[a] law enforcement agency may not obtain, receive, or use data acquired through an unmanned aerial vehicle unless the data is obtained: (a) pursuant to a search warrant; [or] (b) in accordance with judicially recognized exceptions to warrant requirements.” UTAH CODE ANN. § 63G-18-103(1) (West 2014). In Wisconsin, no “law enforcement agency may use a drone to gather evidence or other information in a criminal investigation from or at a place or location where an individual has a reasonable expectation of privacy without first obtaining a search warrant.” WIS. STAT. ANN. § 175.55(2) (West 2014). Montana law provides that, “[i]n any prosecution or proceeding within the state of Montana, information from an unmanned aerial vehicle is not admissible as evidence unless the information was obtained: (a) pursuant to the authority of a search warrant; or (b) in accordance with judicially recognized exceptions to the warrant requirement.” MONT. CODE ANN. § 46-5-109(1) (2013). And Tennessee prohibits “law enforcement agenc[ies]” from using “a drone to gather evidence or other information,” but makes an exception when “law enforcement agency first obtains a search warrant signed by a judge authorizing the use of drone.” TENN. CODE ANN. §§ 39-13-609(c), (d)(2) (2014). Along the same lines, a bill introduced in the State of Washington would require a

would need to put together a warrant application with sufficient facts to prove to a judge that they had probable cause.<sup>172</sup> In most instances, a warrant application will need to define with particularity the place to be searched or the persons to be surveilled.<sup>173</sup> Thus, to observe people gathered in a public place like a park or at a public event like a parade or a rally, these drone-specific warrant requirements would necessitate a detailed application to view what was already publicly visible, merely because the observation was made by a drone, rather than by an officer on a rooftop or in a helicopter.<sup>174</sup> Nothing in the Fourth Amendment requires a warrant for observations of persons in public places, but those who argue for a warrant requirement for drone use would impose such obligations on law enforcement.<sup>175</sup>

The imposition of rules that exceed the requirements of the Fourth Amendment is particularly problematic because, in reality, making out the probable cause showing when the police want to observe large public gatherings will be difficult, if not impossible, for the police to satisfy. After all, if the police knew who in a crowd was a potential bomber, they would arrest those individuals. Rather, a public gathering is the type of event where the police would want to use a drone to monitor wide areas generally, looking for unknown attackers, and in the unfortunate event of an attack, use the footage to identify the perpetrators after the fact. This is akin to what the police do every day by patrolling in their cars, serving as foot patrols in a crowd, or flying overhead in a helicopter. A marathon or other large public gathering is precisely the type of circumstance where the use of a drone could be helpful, but unfortunately, it has been outlawed in many states.<sup>176</sup>

---

warrant to collect “personal information” and limit the duration of such warrants to ten days. *Supra* note 44.

The U.S. Supreme Court has made clear that “[p]robable cause exists where ‘the facts and circumstances within [the arresting officers’] knowledge and of which they had reasonably trustworthy information [are] sufficient in themselves to warrant a man of reasonable caution in the belief that’ an offense has been or is being committed.” *Draper v. United States*, 358 U.S. 307, 313 (1959) (alterations in original) (quoting *Carroll v. United States*, 267 U.S. 132, 162 (1925)); *see also Carroll*, 267 U.S. at 161 (noting probable cause means evidence that would “warrant a man of prudence and caution in believing that the offense has been committed”).

<sup>172</sup> For example, California law provides that “[a] search warrant cannot be issued but upon probable cause, supported by affidavit, naming or describing the person to be searched or searched for, and particularly describing the property, thing, or things and the place to be searched.” CAL. PENAL CODE § 1525 (West 2015).

<sup>173</sup> *Id.*

<sup>174</sup> McNEAL *supra* note \*, at 3.

<sup>175</sup> *See id.*

<sup>176</sup> *See Smith, supra* note 5, at 433–34.



To make matters worse, excluding this type of drone surveillance will do little to protect privacy, as this type of flight poses few direct harms to privacy. After all, a marathon is a highly public event, the event is televised, it takes place on streets where there are surveillance cameras, spectators are photographing the event, and there are even camera operators riding motorcycles following participants in the event.<sup>177</sup> Perhaps even more problematic, states are focusing primarily on drones and do not seem concerned with other types of aerial surveillance equipment. This technology-centric approach has done little to protect privacy but poses a risk to public safety, depriving law enforcement of a tool that it could use to protect potential crime victims. Of course, recording a public gathering does raise concerns about recording and warehousing data about individuals that might later be used to paint a picture about their movements more generally—think of how filming a public rally might chill expression under the First Amendment.<sup>178</sup> This concern, though, is not one that should be addressed by imposing a warrant requirement on drone use; rather it is best addressed by limiting how long a specific person can be surveilled, limiting how long information about individuals can be stored, and implementing rules for when that information must be deleted.<sup>179</sup> Thus, while warrants appeal to privacy advocates, they are a blunt and simplistic instrument that fail to address the particular harms that might flow from aerial surveillance. Imposing such rules does very little to protect privacy but curtails noninvasive, beneficial uses of drones.

### B. *Reject Warrants*

In light of these considerations, this Article argues that calls for proposals that require warrants for the use of drones should be rejected. Legislation that requires warrants for drones treats the information from a drone differently from information gathered from a manned aircraft, by a police officer in a patrol car, or even an officer

---

<sup>177</sup> See, e.g., *BMW Motorcycles Play Key Role in 2013 London Marathon*, ULTIMATE MOTORCYCLING MAG. (Apr. 24, 2013), <https://ultimatemotorcycling.com/2013/04/24/bmw-motorcycles-play-key-role-in-2013-london-marathon/> (noting the use of “camera bikes” alongside marathon runners for recording and timing); Jennifer Levitz & Brian Costa, *Boston Marathon Returns with Heightened Spirit, Security*, WALL ST. J., <http://www.wsj.com/articles/SB10001424052702304626304579509803281225202> (last updated Apr. 21, 2014, 7:29 PM) (noting an estimated one million spectators and over one hundred surveillance cameras were along the Boston Marathon course in 2014).

<sup>178</sup> See Rushin, *supra* note 16, at 54.

<sup>179</sup> *Id.* (recommending state legislation require that surveillance data be destroyed after one year).

on foot patrol. Under current Fourth Amendment jurisprudence, police are not required to shield their eyes from wrongdoing until they have a warrant.<sup>180</sup> Why impose such a requirement on the collection of information by drones? Many of the efforts to impose a warrant requirement rely on the threat of the government's persistent and pervasive surveillance of the population as a reason to impose a warrant restriction.<sup>181</sup> While the danger of persistent and pervasive surveillance is a distinct harm that should be addressed, it should not be addressed through a warrant requirement. Warrants and other authorizations to collect evidence often ban ordinary aerial observations that are only controversial because they take place with a remote-controlled helicopter or airplane (a drone) rather than a manned one. If

---

<sup>180</sup> See *Horton v. California*, 496 U.S. 128, 130 (1990) (“[E]ven though inadvertence is a characteristic of most legitimate ‘plain-view’ seizures, it is not a necessary condition.”); *id.* at 141 (“[T]he seizure of an object in plain view does not involve an intrusion on privacy. If the interest in privacy has been invaded, the violation must have occurred before the object came into plain view and there is no need for an inadvertence limitation on seizures to condemn it.” (footnote omitted)); *California v. Ciraolo*, 476 U.S. 207, 213 (1986) (“That the area is within the curtilage does not itself bar all police observation. 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.”); *Washington v. Chrisman*, 455 U.S. 1, 5–6 (1982) (noting that officer who is lawfully in dorm room may seize marijuana pipe and seeds found in plain view because “[t]he ‘plain view’ exception to the Fourth Amendment warrant requirement permits a law enforcement officer to seize what clearly is incriminating evidence or contraband when it is discovered in a place where the officer has a right to be”); *Harris v. United States*, 390 U.S. 234, 236 (1968) (“It has long been settled that objects falling in the plain view of an officer who has a right to be in the position to have that view are subject to seizure and may be introduced in evidence.”); *Katz v. United States*, 389 U.S. 347, 351 (1967) (“What a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection.”).

<sup>181</sup> See *supra* notes 166–68 and accompanying text; see also STANLEY & CRUMP, *supra* note 22, at 1 (“The prospect of cheap, small, portable flying video surveillance machines threatens to eradicate existing practical limits on aerial monitoring and allow for pervasive surveillance, police fishing expeditions, and abusive use of these tools in a way that could eventually eliminate the privacy Americans have traditionally enjoyed in their movements and activities.”); *id.* at 15 (“In general, drones should not be deployed except[ ] . . . where the government has obtained a warrant based on probable cause.”); Erwin Chemerinsky, *Police Should Get Warrants for Drones*, SACRAMENTO BEE: VIEWPOINTS (Sept. 23, 2014, 12:00 AM), <http://www.sacbee.com/opinion/op-ed/article2610671.html#storylink=cpy> (“Technological developments, like drones, pose a great threat to privacy. The warrant requirement long has been used to balance law enforcement needs and privacy interests. It should be applied to drones, and other emerging technology.”); *Testimony and Statement for the Record of Amie Stepanovich, Associate Litigation Counsel, Electronic Privacy Information Center, Hearing on “Using Unmanned Aerial Systems Within the Homeland: Security Game Changer?” Before the Subcomm. on Oversight, Investigations, & Mgmt. of the H.R. Comm. on Homeland Sec., ELEC. PRIVACY INFO. CTR.* 8 (July 19, 2012), <https://epic.org/privacy/testimony/EPIC-Drone-Testimony-7-12.pdf> (arguing that because of privacy concerns, Congress should adopt legislation that would “limit the use of drone surveillance in criminal investigations without a warrant”).

any person in a Cessna can see pollution pouring from a factory or if police flying in a helicopter can see a cartel's drug operations or human trafficking ring—and such observations can be admitted as evidence in a criminal trial—shouldn't citizens and the police be able to make the same observations from a drone and expect that the evidence will not be excluded merely because it is collected with a remote-controlled aircraft?

For example, imagine a police officer on patrol in her squad car. While driving, she witnesses the car in front of her strike a pedestrian and then speed away. Until witnessing the crime, she did not have probable cause (the predicate level of suspicion for a warrant) or even reasonable suspicion (the predicate level of suspicion for a brief investigatory stop)<sup>182</sup> to believe the vehicle in front of her would be involved in a crime. Let us further assume that her dashboard camera recorded the entire incident. Despite lacking probable cause or reasonable suspicion, the evidence from the dashboard camera may be admitted and used against the driver in a subsequent criminal proceeding. However, under the broadly worded proposals that have been introduced in many state legislatures and the U.S. Congress, the same piece of evidence if gathered by a drone would be inadmissible in court because police did not have a warrant. That restriction does not protect privacy; it merely protects criminality.

Consider another example: police receive an anonymous tip that someone is growing marijuana in his backyard. A police officer attempts to view the backyard from the ground, but a ten-foot tall fence blocks his view. The officer next decides to fly a commercially available remote-controlled helicopter over the suspect's backyard. From a vantage point that does not violate FAA regulations, the officer observes marijuana plants growing in the yard. This observation would be unlawful under proposals that require a warrant for observations from a drone. However, these facts are nearly identical to the facts in the Supreme Court's 1986 *California v. Ciraolo* decision that upheld aerial surveillance.<sup>183</sup> The only difference is that in *Ciraolo*, the officer flew over the backyard in an airplane, rather than using a drone.<sup>184</sup> In fact, the *Ciraolo* Court noted that not only would observation of the marijuana plants from the air (as described above) be lawful, but suggested that police officers peering over the fence from the top of a

---

<sup>182</sup> See *Terry v. Ohio*, 392 U.S. 1, 20–22 (1968).

<sup>183</sup> See *Ciraolo*, 476 U.S. at 209.

<sup>184</sup> *Id.*

police truck would also be lawful.<sup>185</sup> By extension, an observation of the marijuana plants by police from the third floor of a neighboring home would also be lawful. However, under proposals requiring a warrant for drone observations, this evidence would be inadmissible merely because it came from a drone.

The examples above raise questions about what public policy goals are advanced when evidence documented by a drone is suppressed and when the same evidence, if recorded by a dashboard camera, observed from an airplane, or viewed from a neighboring home would be admissible in court. No policy goal is advanced. Rather, the warrant requirement serves only to prohibit most uses of drones while claiming to prevent certain harms, like persistent surveillance. These harms, however, are best addressed by more narrowly tailored reforms.

### C. *Reject Use Restrictions*

Some jurisdictions have approached the challenge of drones by not only requiring warrants, but also by enacting limitations on how information gathered from drones may be used.<sup>186</sup> These restrictions are an effort to allow for beneficial drone usage while limiting the

---

<sup>185</sup> See *id.* at 211.

<sup>186</sup> For example, North Carolina provides that “no State or local governmental entity or officer may procure or operate an unmanned aircraft system or disclose personal information about any person acquired through the operation of an unmanned aircraft system unless the State CIO approves an exception specifically granting disclosure, use, or purchase. Any exceptions to the prohibition in this subsection shall be reported immediately to the Joint Legislative Oversight Committee on Information Technology and the Fiscal Research Division.” Current Operations and Capital Improvements Appropriations Act of 2013, No. 360, § 7.16(e) 2013 N.C. Sess. Laws. 995, 1040.

Oregon generally prohibits the use of drones to “acquire information” and the disclosure of “information acquired through the operation of a drone.” OR. REV. STAT. ANN. § 837.310(1) (West 2014). The law does, however, make a number of exceptions to the prohibition on use and disclosure, including for the use of drones with a warrant, with consent, for search and rescue and other exigencies, and to reconstruct crime scenes. *Id.* §§ 837.320–.340.

Texas allows images captured by drones to be used by law enforcement for, among other things, “the purpose of documenting a crime scene,” “for the purpose of investigating the scene of . . . a human fatality . . . [or] a motor vehicle accident,” or “in connection with the search for a missing person.” TEX. GOV’T CODE ANN. § 423.002(a)(8)(B)–(C) (West 2014). “A person commits an offense if the person uses an unmanned aircraft to capture an image of an individual or privately owned real property . . . with the intent to conduct surveillance on the individual or property captured in the image.” *Id.* § 423.003(a). And such images “may not be used as evidence in any criminal or juvenile proceeding, civil action, or administrative proceeding.” *Id.* § 423.005(a)(1).

In Virginia, no “government department, agency or instrumentality having jurisdiction over criminal law enforcement or regulatory violations” was allowed to operate a drone until July 1, 2015. 2013 Va. Acts 1408. Exceptions exist for Amber Alerts, Senior Alerts, Blue Alerts, search

fruits of surveillance, thereby limiting the privacy impact of drone surveillance. Such proposals appear reasonable, but are in fact misguided. The proposals generally prohibit the use of any evidence that drones gather in nearly any proceeding or prohibit it unless the gathering was accompanied by a warrant.<sup>187</sup> Such restrictions exceed the parameters of the Fourth Amendment and in some circumstances may only serve to protect criminals without deterring governmental wrongdoing. The examples below will illustrate the hazards of use limitations.

In February 2013, the Alameda County California Sheriff's Department proposed the use of small drones for crime-scene documentation, disposal of explosive ordinances, hazardous-material response, search and rescue, public safety and life preservation missions, disaster response, fire prevention, and documentation of a felony when such documentation is premised upon probable cause.<sup>188</sup> Linda Lye, a privacy advocate with the ACLU, criticized the proposal:

If the sheriff wants a drone for search and rescue then the policy should say he can only use it for search and rescue . . . . Unfortunately under his policy he can deploy a drone for search and rescue, but then use the data for untold other purposes. That is a huge loophole, it's an exception that swallows the rule.<sup>189</sup>

Her points mirror the ACLU's position in its December 2011 white paper stating that drone use is acceptable so long as "the surveillance will not be used for secondary law enforcement purposes."<sup>190</sup> It is also similar to the language used in other proposals, such as the Preserving American Privacy Act of 2013, which would prohibit the use of information gathered by a drone "as evidence against an individual in any trial, hearing, or other proceeding."<sup>191</sup>

---

and rescue operations, and operations by the National Guard, but weaponized unmanned aircraft systems may never be deployed. *Id.*

<sup>187</sup> See *supra* note 186.

<sup>188</sup> Alameda County Sheriff's Office, Draft General Order No. 6.15, <http://nomby.files.wordpress.com/2013/02/small-unmanned-aircraft-system-general-order-6-15-draft.pdf>.

<sup>189</sup> Paul Detrick, *Cops with Drones: Alameda Co., CA Weighs Technology vs. Privacy*, REASON.COM (Apr. 4, 2013), <http://reason.com/reasonstv/2013/04/04/cops-with-drones-technology-vs-privacy> (quoting Linda Lye, ACLU privacy advocate).

<sup>190</sup> STANLEY & CRUMP, *supra* note 22, at 16.

<sup>191</sup> See H.R. 637, 113th Cong. (2013). Although the Act would provide a set of exceptions, including one for emergencies, the language of the emergency exception as currently drafted does not clearly specify that inadvertent discovery of information unrelated to the emergency justifying the drone usage would be admissible. *Id.* It is likely that defense counsel in such a

A simple hypothetical can help to illustrate the problem with this use limitation, or the “secondary law enforcement” limitation. Imagine that law enforcement uses a drone to search for a lost hiker in a state park. This is a search and rescue mission that would fit within the public safety, emergency, or exigency exceptions in most legislative proposals aimed at controlling drone usage.<sup>192</sup> However, imagine that during the course of the search for the lost hiker the drone observed a man stabbing a woman to death in the park. That collection would be entirely inadvertent because the goal of the flight was to search and rescue a lost hiker. As an inadvertent observation, suppressing the videotape of the stabbing in a trial against the stabber would not serve to deter the police from using drones in the future because they were not searching for an unrelated stabbing crime—they were searching for a lost hiker.<sup>193</sup> Yet, the blanket use restrictions found in various proposals circulating in state legislatures, Congress, and under the ACLU’s “secondary law enforcement purposes” standard would need to be suppressed against the stabber at trial because it was gathered without a warrant.

Suppressing so-called secondarily gathered evidence doesn’t protect privacy because inadvertent discovery is unexpected and therefore cannot be deterred. Rather, suppressing such evidence merely protects a criminal, who, if observed from a helicopter, an airplane, or from the ground would face evidence of his crime. Under broadly worded drone-focused privacy bills, however, such a criminal may be more difficult to prosecute. It is difficult to see what public policy goal is furthered by suppressing evidence of a crime merely because the evidence was gathered from a drone instead of a helicopter. Do scholars and legislators arguing for such a requirement really want to be in the position of making it harder to punish perpetrators of violent crimes? If the discovery were genuinely inadvertent, there is little to no deterrent value that justifies suppressing such evidence.

#### *D. Recognize the Nuanced Nature of Surveillance Law and the Context-Based Exceptions to the Warrant Requirement*

Most scholars and advocates seeking to impose a statutory warrant requirement on the use of drones have failed to argue for codifi-

---

case would seek to prohibit the admission of evidence in such a case by relying on the lack of a clearly specified exception.

<sup>192</sup> See *id.*; *supra* note 186.

<sup>193</sup> See, e.g., *Hudson v. Michigan*, 547 U.S. 586, 622 (2006) (“[T]he exclusionary rule protects more general ‘privacy values through deterrence of future police misconduct.’”).

cation of the exceptions to the warrant requirement and exclusionary rule that courts have developed through decades of jurisprudence.<sup>194</sup> Not allowing for the codification of such exceptions is a substantial failure on the part of warrant-requirement advocates, making their proposals nearly unworkable as they will leave courts to decide on a case-by-case basis whether all, some, or none of the existing exceptions to the warrant requirement apply.

As the Supreme Court has noted, suppressing evidence has serious consequences for the “truth-seeking and law enforcement objectives” of our criminal justice system, and as such should present “a high obstacle for those urging application” of the exclusionary rule,<sup>195</sup> and should be “our last resort, not our first impulse.”<sup>196</sup> Thus, at a minimum, if scholars continue to argue for a warrant requirement for aerial surveillance, the measure for when we should apply the exclusionary rule should not be whether a drone was used, but rather when “the benefits of deterrence [ ] outweigh the costs.”<sup>197</sup>

Because this Article rejects the idea of a warrant requirement, the passages below will briefly outline some of the exceptions and other procedural devices that should be considered and analyzed before any proposed warrant requirement for aerial surveillance is taken seriously.<sup>198</sup>

Rather than codify a blanket restriction on the use of any information gathered from a drone, legislators should codify a standing requirement that premises one’s ability to exclude evidence on whether the person raising the exclusionary claim was the purported target of drone surveillance. Thus, if law enforcement uses a drone to document illegal dumping of toxic waste by *co-conspirator 1*, nonpresent *co-conspirator 2*’s privacy rights were not violated, and 2 should not have the ability to vicariously assert 1’s privacy rights to protect himself from prosecution. Evidence gathered by drones should be admissible in proceedings short of trial such as grand jury proceedings,<sup>199</sup>

---

194 See *supra* note 181.

195 Pa. Bd. of Probation & Parole v. Scott, 524 U.S. 357, 364–65 (1998).

196 Hudson v. Michigan, 547 U.S. 586, 591 (2006).

197 Herring v. United States, 555 U.S. 135, 141 (2009).

198 This list of exceptions was drawn from 1 JOSHUA DRESSLER & ALAN C. MICHAELS, UNDERSTANDING CRIMINAL PROCEDURE chs. 19–20, 22 (6th ed. 2013).

199 This is consistent with the Supreme Court’s approach to Fourth Amendment violations in *United States v. Calandra*, 414 U.S. 338 (1974). There, the Court noted that “[a]llowing a grand jury witness to invoke the exclusionary rule would unduly interfere with the effective and expeditious discharge of the grand jury’s duties.” *Id.* at 350. The Court concluded that “extending the rule to grand jury proceedings is uncertain at best.” *Id.* at 351. “Such an extension,”

preliminary hearings,<sup>200</sup> bail hearings,<sup>201</sup> and other nontrial proceedings.

Evidence gathered by drones should also be admissible for impeachment purposes, as there is little deterrent value in keeping such impeachment evidence out of a trial (as law enforcement is unlikely to gather it solely for that purpose), and the use of evidence gathered by drones for such a limited purpose furthers the truth-seeking process and deters perjury.<sup>202</sup>

If legislators impose a statutory warrant requirement on the use of drones, they should also codify directly, or by reference, the body of jurisprudence associated with the so-called good faith exception articulated in *United States v. Leon*<sup>203</sup> and *Massachusetts v. Sheppard*.<sup>204</sup> The good faith exception allows for the admission of evidence gathered pursuant to a defective warrant unless, based on objective facts, “a reasonably well trained officer would have known that the search was illegal despite the magistrate’s authorization.”<sup>205</sup>

Legislators should next make clear that the independent source doctrine as articulated in *Murray v. United States*<sup>206</sup> applies equally to drone-related surveillance. The independent source doctrine allows for the admission of evidence, despite police illegality, if the evidence seized was not causally linked to the illegal police conduct.<sup>207</sup>

Legislators should codify the inevitable discovery rule articulated in *Nix v. Williams*.<sup>208</sup> In the context of drone surveillance, the rule would operate to allow the admission of drone-gathered evidence in a criminal trial if the prosecutor can prove (by a preponderance of the

---

the Court said, “would deter only police investigation consciously directed toward the discovery of evidence solely for use in a grand jury investigation.” *Id.*

200 This is consistent with Congress’s guidance in Federal Rule of Criminal Procedure 5.1(e), which states in relevant part, that “[a]t the preliminary hearing, the defendant may cross-examine adverse witnesses and may introduce evidence but may not object to evidence on the ground that it was unlawfully acquired.”

201 See 18 U.S.C. § 3142(f) (2012) (“The rules concerning admissibility of evidence in criminal trials do not apply to the presentation and consideration of information at the hearing.”).

202 *Contra James v. Illinois*, 493 U.S. 307, 317–18 (1990) (arguing that disallowing use of illegally obtained evidence for impeachment may in fact deter police misconduct and that any gains to truth-seeking may be offset by loss of probative witness testimony).

203 *United States v. Leon*, 468 U.S. 897 (1984).

204 *Massachusetts v. Sheppard*, 468 U.S. 981 (1984).

205 *Leon*, 468 U.S. at 922 n.23.

206 *Murray v. United States*, 487 U.S. 533 (1988).

207 See *id.* at 537–38.

208 *Nix v. Williams*, 467 U.S. 431 (1984).



evidence) that the evidence would have ultimately or inevitably been discovered by lawful means.<sup>209</sup>

Rather than suppress all fruit of drone surveillance, legislators should codify the attenuation principles articulated in *Nardone v. United States*<sup>210</sup> and *Wong Sun v. United States*.<sup>211</sup> The Court in *Wong Sun* stated that when considering whether fruit of an unlawful search should be suppressed, a court must ask “whether, granting establishment of the primary illegality, the evidence to which instant objection is made has been come at by exploitation of that illegality or instead by means sufficiently distinguishable to be purged of the primary taint.”<sup>212</sup> Stated differently, at some point the fruit of the poisonous tree loses its potency. Legislators should consider the following factors: (1) passage of time between the illegal search and the acquisition of evidence, (2) intervening events and a lack of foreseeability that the illegal drone surveillance would result in the gathering of evidence, and (3) whether the initial illegal surveillance was a flagrant or deliberate violation rather than an accidental one.<sup>213</sup>

### E. Embrace Technology

Perhaps the biggest problem with a warrant requirement is that it fails to recognize that someday, surveillance from unmanned aircraft may be more protective of privacy than manned surveillance. Technology continues to evolve at such a rapid pace that it is possible drones and other aerial surveillance technologies may enable targeted surveillance that protects collateral privacy harms while still allowing for the collection of evidence. Technology can further the goal of privacy by using geofencing technology to only collect evidence from specific locations and using redaction programming to automatically obscure information (such as faces) at the point of collection.<sup>214</sup> Crea-

---

<sup>209</sup> *Nix* was a Sixth Amendment case, but courts have applied the fruits analysis to searches. See Stephen E. Hessler, Note, *Establishing Inevitability Without Active Pursuit: Defining the Inevitable Discovery Exception to the Fourth Amendment Exclusionary Rule*, 99 MICH. L. REV. 238, 241–43 (2000) (discussing the *Nix* exception as applied to the Fourth Amendment).

<sup>210</sup> *Nardone v. United States*, 308 U.S. 338 (1939).

<sup>211</sup> *Wong Sun v. United States*, 371 U.S. 471 (1963).

<sup>212</sup> *Id.* at 488 (quoting JOHN MACARTHUR MAGUIRE, EVIDENCE OF GUILT 221 (1959)).

<sup>213</sup> See *Brown v. Illinois*, 422 U.S. 590, 603–04 (1975).

<sup>214</sup> See *Geofencing*, TECHNOPEDIA <http://www.techopedia.com/definition/14937/geofencing> (last visited Feb. 9, 2016) (“Geofencing is a technology that defines a virtual boundary around a real-world geographical area. In doing so, a radius of interest is established that can trigger an action in a geo-enabled phone or other portable electronic device.”); Chris Hackett & Michael Grosinger, *The Growth of Geofence Tools Within the Mapping Technology Sphere*, PDVWIRELESS BLOG, <http://corp.pdvwireless.com/the-growth-of-geofence-tools-within-the-mapping-tech->

tive policymakers can embrace technology by writing laws requiring that aerial surveillance devices have systems to protect privacy.<sup>215</sup>

For example, imagine that the police receive a tip about marijuana growing in the backyard of 123 Main Street. They dispatch a helicopter to gather aerial photographs of the 123 Main Street property from an altitude of 700 feet. While the police are overhead photographing 123 Main Street, they look down and see a woman sunbathing in the adjacent property at 125 Main Street. Though the inadvertent observation of the woman at 125 Main Street does not violate her Fourth Amendment rights, she will likely consider it an offensive intrusion that violates her personal expectation of privacy (even if it's not one that society, per Supreme Court jurisprudence, is willing to deem reasonable).<sup>216</sup> Now, imagine the same collection scenario, this time conducted by a drone or a camera on a manned helicopter with software that is programmed to protect privacy. Prior to the mission the aircraft is instructed to only document the ongoing activities at 123 Main Street. The software could be required to automatically redact any additional information gathered from adjoining properties (such as 125 Main Street, the home of our hypothetical sunbather). Furthermore, legislators could require that software automatically redact the faces of individuals.<sup>217</sup> The redaction could be removed at a later date, perhaps after a showing of reasonable suspicion or probable cause (the particular standard to be determined by the legislature) to believe that the auto-redacted person's face is important because they are or were involved in criminal activity. If a state or local government required that aircraft engaged in aerial surveillance be coded for privacy, the rights of the adjacent sunbather and any other inadvertently observed individuals would be protected. Policies requiring that drones be coded for privacy could evolve society to the point where unmanned drones are *required* when manned flights might place law enforcement officers in a situation where they could make unwanted observations of innocent people. Warrant requirements do

---

nology-sphere/ (last visited Feb. 9, 2016) ("Geofencing also represents a critical element within telematics hardware and software. It allows system users to draw zones around places of work, customer sites and secure areas.").

215 See, e.g., Rule, *supra* note 5, at 201 (recommending simple GPS software and registration systems to track drones and retrieve their information).

216 See *supra* Sections II.A–B.

217 See Eric Pfeiffer, *How a Seattle Programmer Used Public Records Laws to Push Police to Fix a Surveillance Video Tech Headache*, GOV'T EXEC. (Jan. 8, 2015), <http://www.govexec.com/state-local/2015/01/seattle-police-camera-video-redaction/102483/> (discussing "fully autonomous" software code that "rapidly identifies red-flag items" in surveillance videos "and highlights them for redaction").

little to allow this type of privacy-protective technology to develop; they merely act as a soft ban on drones. The next Part argues that privacy can be protected without resorting to a warrant requirement; it argues that narrowly tailored reforms can, in fact, be more protective of privacy than warrants.

#### IV. REFORMS

This Part proposes five reforms. Those reforms are focused on defining vantage points from which drones should be prohibited from operating, placing limits on how long the government may surveil particular persons from the air, requiring data-retention procedures that increase procedural protections over time, urging the adoption of transparency and accountability measures, and institutionalizing new forms of oversight.

##### A. *Defining Property Rights Is a Necessary but Insufficient Part of Reform*

The uncertainty associated with landowner rights in the airspace immediately above their property has raised two problems. First, there is little clarity regarding where low-altitude aerial surveillance by the government would violate the Fourth Amendment. Is it at 500 feet if by a fixed-wing aircraft or 1000 feet?<sup>218</sup> Is it 400 feet if by a helicopter? In *Riley*, the Court said that the surveillance conducted at 400 feet by a helicopter did not require a warrant, but it left open the possibility that surveillance at a lower altitude could be acceptable.<sup>219</sup> *Riley*'s holding raises the question, what about a flight at 350 feet or 325? What about 200 feet or the eighty-three feet from *Causby*? The caselaw on whether this would be a lawful observation is not clear, but it is difficult to see how a court applying the principles of *Riley* would find substantive differences from an observation at 200 feet versus one at 400 feet. That is because the Supreme Court's jurisprudence tells us to look at whether the observation took place from "navigable airspace"—a vantage point from which any member of the public could make an observation.<sup>220</sup>

Given the FAA regulations that limit the heights at which people may fly aircraft, a court following *Riley* might find it plausible that aircraft flown at 200 feet would also be at a public vantage point. For

---

<sup>218</sup> Notably, FAA regulations don't clearly answer this question; the minimum altitude varies based on how congested an area is. See discussion *infra* Part IV.A.2.

<sup>219</sup> See *Florida v. Riley*, 488 U.S. 445, 451–52 (1989).

<sup>220</sup> See *id.* at 451.

helicopters, navigable airspace includes 200 feet above ground level so long as the pilot is not creating a hazard.<sup>221</sup> However, anything below 200 feet would likely be hazardous, as the FAA does not require the charting or lighting of obstacles that are lower than 200 feet in height.<sup>222</sup> FAA rules and guidelines also require that operation of drones and model aircraft take place below 400 feet,<sup>223</sup> and the proposed rules for commercial drone operations require those flights to take place below 500 feet.<sup>224</sup> Because operation of aircraft at 200 feet would be at a public vantage point and thus permissible under *Riley's* interpretation of the Fourth Amendment, the onus will be on landowners rather than aircraft operators to prevent aerial observations from certain vantage points. A legislative solution for aerial surveillance must address this issue.

A second problem arising out of the uncertainty of a landowner's airspace rights is the issue of protecting one's privacy against private, nongovernmental drone operators. While private drone use is beyond the scope of this Article, the right to exclude the government from conducting aerial surveillance is inextricably tied to whether the public would have had a right to make the observation the police made.<sup>225</sup> The linkage of these two concepts suggests that a property-rights approach may provide a way to harmonize these separate policy con-

---

<sup>221</sup> See 14 C.F.R. § 91.119 (2015), which reads:

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

- (a) *Anywhere.* An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.
- (b) *Over congested areas.* Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.
- (c) *Over other than congested areas.* An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.
- (d) *Helicopters, powered parachutes, and weight-shift-control aircraft.* If the operation is conducted without hazard to persons or property on the surface—
  - (1) A helicopter may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA . . . .

<sup>222</sup> The FAA requires notice of “[a]ny construction or alteration that is more than 200 feet” above ground level. 14 C.F.R. § 77.9(a) (2015). Such notice is used by the FAA to “[d]etermine appropriate marking and lighting recommendations.” *Id.* § 77.5(c)(3).

<sup>223</sup> See Interpretation of the Special Rule for Model Aircraft, *supra* note 37, at 36,172.

<sup>224</sup> See NPRM, *supra* note 8, at 9562.

<sup>225</sup> See *supra* Part II.A–B.

cerns (specifically surveillance by private actors and surveillance by public actors) and thereby address most of the concerns associated with aerial surveillance.

Although state and local laws almost exclusively govern matters involving ownership of airspace at low altitudes, those laws are still not comprehensive. Arizona State law professor Troy Rule, one of the first scholars to analyze property rights in the context of drones, notes the stark contrast in the clarity of laws delineating property rights on surface land and the laws governing low-altitude airspace.<sup>226</sup> The surface landowners, Professor Rule explains, have an unambiguous right to exclude trespassers and other intruders from entering the clearly defined boundaries of surface land.<sup>227</sup> Conversely, “[t]he commons regime that governs high-altitude airspace is in many ways the antithesis of the private property regime that applies to surface land: no one owns high-altitude space, and everyone is welcome to use it if they follow certain rules.”<sup>228</sup> Yet the low-altitude airspace between the privatized surface land and high-altitude commons has largely undefined rules.<sup>229</sup> State and local governments should act to clarify the rights of landowners in the zone between the land and high-altitude airspace.<sup>230</sup>

State and local governments that act to craft laws clarifying property rights in low-altitude airspace could do so by arguing they are merely codifying long-standing property law. In so doing, state and local governments could rely on the *Causby* Court’s declaration that “the flight of airplanes, which skim the surface but do not touch it, is as much an appropriation of the use of the land as a more conventional entry upon it.”<sup>231</sup> Such flights, the Court said, “are in the same category as invasions of the surface.”<sup>232</sup>

If low-altitude flights above a landowner’s property are akin to walking onto that property, then for Fourth Amendment purposes, police drones might be deemed to walk on any property that they fly

---

226 See Rule, *supra* note 5, at 174–75 (“Unlike the murky set of legal rules governing low-altitude airspace, the laws delineating property rights in the surface land could hardly be clearer.”).

227 *Id.* at 176.

228 *Id.* at 180 (footnote omitted).

229 *Id.* at 182.

230 Professor Rule suggests a similar solution, namely that “state legislatures could . . . enact[] new laws that give landowners clear rights to exclude drones or other aircraft from entering into the low-altitude airspace above their land up to the existing navigable airspace line.” *Id.* at 187.

231 *United States v. Causby*, 328 U.S. 256, 264 (1946).

232 *Id.* at 265.

over at a low altitude. If legislators aim to categorically prevent warrantless police-drone flights over private property, legislators could merely craft statutes that provide property owners with clearer rights to exclude the public from private land; the *Causby* Court's decision would automatically extend to the airspace immediately above that property.

Granted, police could evade this rule by asking a neighbor for permission to fly above his adjacent property to obtain an adequate vantage point, just as police (or private citizens) may ask a neighbor to permit observation from a second-floor window into neighboring property. Similarly, such a rule would not preclude flights over public land, such as sidewalks and streets, but local zoning laws could address flights over public land.

### 1. *Property Rights Should Be Defined*

The proposal set forth below will preclude the police from flying at low altitudes directly over a greenhouse like the one in *Riley* or directly over a backyard like that in *Ciraolo*, but it would preserve the ability of the police to conduct those already lawful surveillance activities at or near the altitudes at which they were conducted in *Riley* (above 400 feet) and *Ciraolo* (above 1000 feet). In essence, the proposal set forth below is a status quo solution.

What might such a statute look like? To preserve privacy, the landowner's right must extend high enough to make the exclusion effective. However, to preserve a right of transit for drones (such as Amazon or Google delivery drones, a mapping and real estate drone, or model aircraft), the right of exclusion cannot extend all the way up to the manned navigable airspace line (500 feet in most locations, 1000 feet in congested areas).<sup>233</sup>

This Article argues that an appropriate statute would state that landowners own the airspace above their property—up to 200 feet above ground level. In most locations, that will provide the land-

---

<sup>233</sup> For a contrary approach that extends the right to the public navigable airspace line, see Rule, *supra* note 5, at 187–88. (“To preserve a level of privacy and safety comparable to what landowners enjoyed prior to the drones era, laws clarifying landowner airspace rights should define these rights as extending *all the way up to the navigable airspace line of 500 feet above-ground* in most locations. A rule defining exclusion rights as covering only 100 feet or 200 feet above the ground would arguably be insufficient because it would allow small drones to cheaply hover above land, potentially violating landowners’ privacy or threatening their safety from those altitudes. . . . Because navigable airspace designations can vary by location, the exact heights of each parcel’s exclusion rights could initially be established based on the FAA’s existing navigable airspace designations.” (emphasis added) (footnote omitted)).

owner with airspace rights that extend to more than five times the height of the average two-story home.<sup>234</sup> By virtue of owning this column of land up to 200 feet, the landowner will have a right to exclude the general public (and therefore the police) from flying above his property in a way that will interfere with his enjoyment of the land.

This proposal draws the line at 200 feet for a few reasons. First, 200 feet is an appropriate line to draw because the FAA has largely ignored the construction of buildings and other structures that might pose an obstacle to air transit when those obstacles are less than 200 feet tall.<sup>235</sup> On the other hand, the construction of obstacles that are 200 feet above ground level requires notice to be filed with the FAA pursuant to 14 C.F.R. § 77.9.<sup>236</sup> Those structures below 200 feet have been the sole province of local zoning authorities. This suggests that in the low-altitude airspace—defined here as airspace below 200 feet—the FAA has largely ceded the field to local authorities. This is an important issue as a local law that extends the property owner's rights too far into the airspace may face a preemption challenge. Second, this proposal will provide a 200-foot buffer space between the ceiling of the property owner's airspace (200 feet) and the ceiling of model aircraft airspace (which allows recreational flights up to 400 feet in altitude), and a 300-foot buffer space between the ceiling of the property owner's airspace (200 feet) and the ceiling of the proposed commercial drone airspace (500 feet).<sup>237</sup> This will allow for a transit zone for model aircraft and drones. Such a transit zone will allow model aircraft and commercial drone operators to traverse the airspace above private property without fear of violating the landowner's property rights, permit space for development of future drones that might take advantage of the transit zones, and simultaneously avoid

---

<sup>234</sup> In circumstances where property is located adjacent to a slope, this proposal may under-protect. For example, depending on the degree of slope, a drone flying between 200 and 500 feet above the ground of the sloped terrain and equipped with a camera and recorder could have an unobstructed, intimate eye and earshot into yards and homes on the slope or ridge top. Legislators in jurisdictions where terrain may pose this policy problem may want to specify the distance drones must remain from homes, or they may want to limit drone flights over adjacent public property.

<sup>235</sup> See 14 C.F.R. § 77.17(a)(2) (2015).

<sup>236</sup> See *supra* note 222.

<sup>237</sup> See Interpretation of the Special Rule for Model Aircraft, *supra* note 37, at 36,172 (400-foot ceiling for model aircraft); NPRM, *supra* note 8, at 9562 (500-foot ceiling for commercial drones); see also Federal Aviation Administration, Fact Sheet—Unmanned Aircraft Systems (UAS) (Jan. 6, 2014) (on file with *The George Washington Law Review*) (“Recreational use of airspace by model aircraft is covered by FAA Advisory Circular 91-57, which generally limits operations to below 400 feet above ground level and away from airports and air traffic.”).

creating circumstances where drone operators will need to choose between violating FAA regulations by traversing into manned airspace above or violating property rights below.

By creating a space from 200 feet to 500 feet, this proposal does admittedly create a space where law enforcement drones could operate in a way that might cause nuisances or violate privacy. The alternative would be to allow landowners to exclude all aircraft from a column of space above their lands, upwards to the lower reaches of manned aviation (500 feet in some areas, 1000 feet in others).<sup>238</sup> The problem with that approach is that it places all of the benefits on the privacy and property side of the ledger without recognizing the significant costs that will be imposed on innovation and future beneficial uses of drones.

Moreover, excluding drones from the property line to the manned aviation line does very little to protect privacy, as moving the limit to 500 feet will likely have a minimal impact on the surveillance capabilities of drones, which at 200 feet may already be operating at the outer limits of their camera equipment.<sup>239</sup> Although there are technological reasons for rejecting the extension of the property right to the manned aviation line, Supreme Court jurisprudence also suggests that limiting observations (from manned or unmanned aircraft) to 200 feet is a near status quo solution. In *Riley*, a warrantless helicopter observation from 400 feet was deemed constitutional, with the Court leaving open the possibility that observations from lower altitudes might also be constitutional.<sup>240</sup> Thus, this proposal to place the line at 200 feet provides greater protections than those in *Riley* by providing greater precision. This proposal creates a bright-line rule at 200 feet, making it clear that *any* aerial intrusion at or below that altitude would violate the landowner's property rights. Surveillance below 200 feet would be a nonpublic vantage point and would violate the Fourth Amendment if information were gathered without a warrant.

Thus, while drones and helicopters might still conduct surveillance at 200 feet, drone surveillance at that altitude will be far less intrusive than helicopter surveillance at 400 feet because a helicopter's

---

<sup>238</sup> Professor Rule argues for such an approach. Rule, *supra* note 5, at 187.

<sup>239</sup> David Kovar, *What Can a Drone Actually "See"?*, INTEGRIOGRAPHY (Aug. 23, 2015), <https://integriography.wordpress.com/2015/08/23/what-can-a-drone-actually-see/> (visually depicting a man in a field photographed with the popular DJI Phantom and showing that at 200 feet "[i]t is hard to find any identifying details of a human . . . above 50 feet" and that "at 200 feet it would be hard to identify the human if you did not know what you [were] looking at").

<sup>240</sup> See *Florida v. Riley*, 488 U.S. 445, 451–52 (1989).



larger size enables it to carry far more sophisticated surveillance equipment. Concomitantly, observations from drones at 200 feet will be far less intrusive than observations from helicopters flying at the same altitude.<sup>241</sup> Although some may express concerns that a drone may persistently surveil property by hovering for long periods, that argument fails for two reasons. First, law enforcement likely cannot afford technology capable of hovering for long periods.<sup>242</sup> Instead, they will likely use systems with flight times of less than one hour.<sup>243</sup> Second, persistent surveillance is a distinct concern, and to protect against it, this Article makes recommendations in the following Sections that are directed at its specific harm (whether conducted from manned or unmanned aircraft) rather than making drone-specific recommendations.

By defining property rights in the manner described above (extending rights up to 200 feet) courts will be in a position where they can readily adjudicate claims asserting that an aerial observation violated the Fourth Amendment. To conduct such an inquiry a court will examine whether an officer had a right to be in the place where he made the observation. Stated differently, the court will look at whether the police observation was from a public vantage point. Answering either of those questions will turn on an analysis of whether the observation took place from a vantage point that violates the landowner's right to exclude and therefore violates his reasonable expectation of privacy. When conducting this analysis, a court need only look to the statute and facts associated with the observation. With drones, those can be readily discernible because most law enforcement drones carry GPS software that pinpoints and documents location and altitude.<sup>244</sup>

## 2. "Navigable Airspace" Is No Longer a Helpful Reference Point

Some scholars and legislators have begun to argue for a property-rights approach, but rather than establishing a defined ceiling in feet,

---

<sup>241</sup> See discussion *infra* Part IV.B (addressing threat of pervasive surveillance whereby law enforcement might park a drone or other aircraft over a landowner's property for extended periods of time).

<sup>242</sup> See *supra* note 48.

<sup>243</sup> See *supra* note 48.

<sup>244</sup> McNEAL *supra* note \*, at 16. "The salutary effect of this approach is that civil suits for unlawful operation of drones above a landowner's property by voyeurs and other onlookers will be adjudicated with reference to clearly defined property rights, allowing courts to evaluate trespass and other claims." *Id.* "States may need to update their trespass laws to address aerial trespass. For example, many jurisdictions define trespass as "entering on" or "remaining on" property[:] legislatures may need to clarify that property includes airspace." *Id.* n.41.

as this Article advocates, those reformers have argued for an extension of the exclusionary zone up to the “navigable airspace.”<sup>245</sup> As discussed in the Introduction to this Article, this is a difficult line to draw due to the changing nature of FAA regulations. That is why this Article favors specifying the exclusionary zone in feet.<sup>246</sup>

To illustrate the point more clearly, consider the problems that will arise with California’s proposed drone trespass bill, a newly introduced piece of legislation that attempts to define airspace rights by referencing FAA regulations, rather than by clearly specifying an altitude. In late January 2015, California State Senator Hannah-Beth Jackson introduced SB 142, a drone trespass measure that aims to prohibit the unauthorized use of unmanned aerial vehicles in airspace directly over private property.<sup>247</sup> The bill will be unenforceable if enacted as drafted because it does not define the airspace directly; rather, it makes reference to “navigable airspace.”<sup>248</sup> It states:

(a) A person knowingly enters onto the land of another person . . . if he or she operates an unmanned aerial vehicle

---

<sup>245</sup> See Rule, *supra* note 5, at 187:

Today, as drone technologies create ever more opportunities for new and valuable uses of low-altitude domestic airspace, pressure is mounting once again for property laws to adapt. Arguably, state legislatures could assist in that process by enacting new laws that give landowners clear rights to exclude drones or other aircraft from entering into the low-altitude airspace above their land up to the existing navigable airspace line—a height of 500 feet above the ground in most areas. Such statutes could specify that these exclusion rights were largely equivalent to rights that landowners have long enjoyed on the surface. Holders of such rights would be entitled to bring actionable trespass claims against operators of drones that invaded their column of airspace simply by proving that the operator intentionally flew the drone into their space. Takings law rules applicable to government invasions on surface land would likewise be extended to low-flying government aircraft.

<sup>246</sup> Oregon has taken a similar approach, as Professor Rule’s research notes:

At least one state legislature has already enacted legislation giving landowners basic drone exclusion rights within a defined column of airspace above their parcels. An Oregon state statute enacted in 2013 included provisions creating a new civil claim for drone trespass. These provisions generally allow real property owners to bring claims against anyone who flies a drone over their parcels a second time at a height of less than 400 feet after being asked not to do so. Plaintiffs who prevail under Oregon’s drone trespass statute can recover treble damages for any injuries to persons or property caused by unwanted drones and can also recover attorney fees in cases where the amount pleaded was less than \$10,000. Although Oregon’s drone trespass law is fairly narrow in scope, it is at least a step in the right direction toward a simpler, clearer set of rules capable of more effectively governing drone activity in low-altitude airspace.

*Id.* at 188 (footnotes omitted).

<sup>247</sup> S.B. 142, 2015-2016 Leg., Reg. Sess. (Cal. 2015), [http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201520160SB142](http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB142).

<sup>248</sup> McNeal, *supra* note 136.

below the navigable airspace, as defined in paragraph (32) of subsection (a) of Section 40102 of Title 49 of the United States Code, overlaying the property.

(b) A person wrongfully occupies real property and is liable for damages . . . if, without permission, he or she operates an unmanned aerial vehicle below the navigable airspace, as defined in paragraph (32) of subsection (a) of Section 42102 of Title 49 of the United States Code, overlaying the real property.<sup>249</sup>

In layman's terms, the bill attempts to say that if an individual flies a drone over someone's property, and below "navigable airspace" as that term is defined in federal law, it is a trespass in California. At first blush, the bill sounds like it will address drone flights over private property, but the proposal and proposals like it are destined to fail for three reasons.

First, the term navigable airspace does all of the heavy lifting in SB 142 and similar proposals relying on the term. Federal law defines "navigable airspace" as "airspace above the minimum altitudes of flight prescribed by regulations under this subpart and subpart III of this part, including airspace needed to ensure safety in the takeoff and landing of aircraft."<sup>250</sup>

While 500 feet is a useful rule of thumb for defining navigable versus nonnavigable airspace, regulations governing navigable airspace are actually a bit more complex. Helicopters, for example, are exempted from minimum altitude regulations "[i]f the operation is conducted without hazard to persons or property on the surface."<sup>251</sup> For fixed-wing aircraft, the rule is that, for over congested areas, the minimum altitude is "1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft."<sup>252</sup> For noncongested areas, other than "over open water or sparsely populated areas," the minimum is 500 feet.<sup>253</sup> Over open water and sparsely populated areas, "the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure."<sup>254</sup> Moreover, within certain distances of certain classes of airports and airspace, altitude restrictions below 500 feet may also be in place.

---

<sup>249</sup> *Id.*

<sup>250</sup> 49 U.S.C. § 40102(a)(32) (2012).

<sup>251</sup> 14 C.F.R. § 91.119(d) (2015).

<sup>252</sup> *Id.* § 91.119(b).

<sup>253</sup> *Id.* § 91.119(c).

<sup>254</sup> *Id.*

These examples drawn from FAA regulations are not intended to be a comprehensive overview of aviation regulations; rather, they highlight the complexities in the law, defining what exactly is navigable airspace. The complexity associated with defining navigable airspace means that legislative proposals that use navigable airspace as a proxy for what constitutes a lawful or unlawful vantage point will hinge on so many difficult variables that the laws will be almost impossible to implement.

The second problem with defining lawful vantage points (or places where one might be trespassing) by making reference to navigable airspace is that the definition in federal regulations also includes the airspace needed to ensure safety in the takeoff and landing of aircraft. In public statements, the FAA has stated that navigable airspace extends down to the ground, at least in circumstances where aircraft are taking off and landing.<sup>255</sup> But, the FAA has recently begun applying that concept to drones and has said that the navigable airspace for drones is anywhere a drone can be operated.<sup>256</sup> According to Jim Williams, a spokesperson for the FAA's unmanned aircraft integration office:

If you are flying in the national airspace system, FAA regulations apply to you. The definition of the national airspace system is anywhere where aircraft can safely navigate. So by definition then, these quadcopters are what have extended the national airspace down to the ground. . . . That's just the situation. I'm not saying it's ideal, but that's what the laws say and that's what the rules say.<sup>257</sup>

What this means is that a drone flying over a California resident's property would never be trespassing under the terms of SB 142, nor would it be making an observation from a vantage point where it did not have a lawful right to be because the FAA interprets navigable airspace as anywhere an aircraft can operate. Under the FAA's interpretation, proposals tying rights to FAA regulations simply provide no rights—drones will always be operating in, not below, the navigable airspace.

Third, the NPRM specifically allows for drone flights from zero to 500 feet above ground level. As the FAA wrote:

[T]he FAA proposes, in § 107.51(b), to set an altitude ceiling of 500 feet above ground level (AGL) for small UAS opera-

---

<sup>255</sup> McNeal, *supra* note 136.

<sup>256</sup> See McNeal, *supra* note 101.

<sup>257</sup> *Id.*

tions that would be subject to this proposed rule. The FAA chose to propose 500 feet as the vertical area-of-operation boundary because most manned aircraft operations take place above 500 feet.<sup>258</sup>

In the NPRM, the FAA proposes a 500-foot ceiling for the navigable airspace for drone operations with the floor of that navigable airspace set at the ground.<sup>259</sup> Thus, if the FAA's proposed regulations are adopted as written, drones will never be operating below navigable airspace. That means proposals that tie rights to the definition of navigable airspace will never be triggered. The solution to this legal morass is to define the airspace in feet, and that is why I argue it should extend upwards to 200 feet above the landowner's property.

It is important to note that establishing the property line at 200 feet is only a partial solution. Merely adopting an airspace right without the other reforms outlined in this Article will do very little to address anything other than drone surveillance—and will only do so for a short period of time as technology is rapidly advancing. As this Section highlighted, manned aircraft are capable of surveillance from extremely far distances, such that they need not be located at a low altitude to conduct surveillance. Eventually technology will advance to allow for drone surveillance from higher altitudes. That's why the subsequent recommendations in this Article go beyond pushing property rights higher but also address the duration of government surveillance, data-retention procedures, and transparency and accountability measures associated with surveillance.

This first proposal is not intended to ban aerial surveillance; rather, it is intended to place aerial surveillance from drones and manned aircraft on equal legal footing. This proposal also ensures that policymakers remain focused on the harms of aerial surveillance, not merely the platform from which the surveillance takes place.

*B. Place Limits on How Long the Government May Surveil from the Air*

Even if policymakers establish property rights in airspace, the buffer airspace between the property owner's airspace and the floor of manned navigable airspace will allow law enforcement to sit in that area and conduct surveillance.<sup>260</sup> Moreover, eventually autonomous drones may be developed that will be able to continuously follow one

---

<sup>258</sup> NPRM, *supra* note 8, at 9562.

<sup>259</sup> *Id.*

<sup>260</sup> *See supra* Part IV.A.1.

particular person, tracking their movements.<sup>261</sup> To address these concerns, policymakers should focus on controlling the duration of surveillance.<sup>262</sup> Doing so will limit two feared harms: First, duration-based limits on aerial surveillance will address the possibility that drones or other technologies will enable the police to follow individuals and monitor their day-to-day activities. Second, duration-based limits will address the possibility that drones or other aircraft will be used to hover directly above a landowner's property for lengthy periods of time monitoring an individual's day-to-day activities. Of course, these two forms of persistent surveillance can be conducted with manned or unmanned aircraft, therefore an appropriate reform should not focus on the technology (a drone, for example) but rather on the duration of surveillance. In other words, the target of reforms should be the harmful surveillance, not the platform from which the surveillance can be conducted.

Crafting legislation that places aggregate limits on how long law enforcement may surveil specific persons or places can protect against the possibility of persistent surveillance. Such a legislative scheme might look like this:

- Aerial surveillance of a person may continue for sixty minutes in any seven-day period at the officer's discretion.
- Aerial surveillance extending from sixty minutes to forty-eight hours in any seven-day period may only take place with a court order and reasonable suspicion.
- Aerial surveillance of longer than forty-eight hours in any seven-day period is permissible only when accompanied by a warrant and probable cause.<sup>263</sup>

The specific duration on which legislators may settle (and the period of aggregation) will depend on whether a jurisdiction places a higher value on privacy or the efficiency of law enforcement. This reform is focused on surveillance of a specific person. If surveillance of widespread areas is occurring, legislators may want lengthier limits.

---

<sup>261</sup> See, e.g., Ben Coxworth, *HEXO+ Drone Autonomously Follows the Action, for Under \$500*, GIZMAG (June 16, 2014), <http://www.gizmag.com/hexo-plus-autonomous-drone/32560/>; Stu Roberts, *AirDog Drone Automatically Follows You and Films Your Sporting Feats*, GIZMAG (June 17, 2014), <http://www.gizmag.com/airdog-auto-follow-action-sports-drone/32576/>.

<sup>262</sup> I recognize that this does nothing to address surveillance from satellites, but state and local governments are unlikely to engage in widespread surveillance from satellites as the technology is not readily accessible and does not provide real-time information.

<sup>263</sup> This recommendation is adapted in part from Christopher Slobogin, *Making the Most of United States v. Jones in a Surveillance Society: A Statutory Implementation of Mosaic Theory*, 8 DUKE J. CONST. L. & PUB. POL'Y SPECIAL ISSUE 1, 24 (2012).

For example, limiting aerial surveillance to sixty minutes unless accompanied by a warrant would mean that law enforcement could not monitor specific events such as the Boston Marathon. Such a limitation is likely not a desired policy outcome, and policymakers should be careful to craft limitations in such a way that they address the harm of persistent surveillance (tracking of individuals) versus area or pervasive surveillance (to ensure public safety) or event-based surveillance.

Although policymakers may disagree as to what amount of time to choose, carefully crafting duration-based rules for manned or unmanned surveillance is a superior approach to rules that focus merely on drones, as such technology-centric approaches will oftentimes be riddled with blanket bans and exceptions.<sup>264</sup> By legislating with a focus on persistent surveillance, legislators can create rules based on clearly defined durational limits, thus creating public policy that is easier to follow, “easier for courts to adjudicate, and doesn’t allow for loopholes based on technology.”<sup>265</sup>

*C. Adopt Data-Retention Procedures That Require Heightened Levels of Suspicion and Increased Procedural Protections over Time*

“Many critics of drones raise the legitimate concern that the government’s collection of aerial imagery and video will enable pervasive surveillance that allows the government to know what all citizens are doing at all points in time.”<sup>266</sup> This concern about the government warehousing information about individuals that may be accessible years after its collection is not unique to drones, but it is nevertheless troubling as it may allow the government to review footage years after its collection, revealing the most intimate details about a person’s life. While this is a recurring theme in critiques of all video and still imagery collection, it is one that can be remedied by encouraging legislators to adopt policies that address collection and retention of information in a way that focuses on the information that is collected, how it is stored, and how it is accessed, rather than the particular technology used to collect the information. Thus, while this Part of the

---

<sup>264</sup> To see the perils of a process riddled with exceptions, consider the bill that the Texas legislature passed, which has no fewer than twenty-two exceptions for drone use with carve-outs for agricultural interests, electrical companies, oil companies, real estate brokers, and others. McNEAL, *supra* note \*, at 18 n.43 (citing Texas Privacy Act, ch. 1390, § 423.002, 2013 Tex. Gen. Laws 3691, 3691–92).

<sup>265</sup> *Id.*

<sup>266</sup> *Id.*

Article speaks specifically about drones, the principles articulated here apply to all forms of video and imagery collection.<sup>267</sup>

Legislators should enact retention policies and procedures that make it more difficult for the government to access information as time passes, doing so will protect against pervasive surveillance and warehousing of data about citizens. Data should also have an expiration date, such that information collected by the government should be destroyed at the end of a predetermined period of time. The specific duration of time and processes may be subject to debate and may even need to be recalibrated as the public learns more about what works and what does not work, but the key is to ensure that all procedures and timelines are legislatively determined. Creating clear directives and embedding them in statutes will ensure these procedures and timelines cannot be modified by individual agencies. To protect the rights of individuals, the information gathered and stored should be exempt from sunshine act requests, but the fact of collection practices should not be exempt, and of course the actual information gathered should be fully discoverable in any criminal prosecution.<sup>268</sup>

A few procedural ideas are outlined below that will form the bulk of any responsible retention procedure:

At the moment of collection up to 30 days after collection, information should be treated like any other contemporaneous or near contemporaneous observation. Agents of government should be able to monitor aerial surveillance in real time or near real time just as they observe CCTVs in real time or near real time. This 30 day window will allow law enforcement to respond to immediate or nearly immediate complaints about violations of the law. After 30 days have passed from initial collection, information gathered from aerial surveillance should be moved from servers openly accessible by law enforcement to servers that are only accessible with a court order and a showing of reasonable suspicion. After 90 days have passed from initial collection, police should not be allowed to access information stored on servers without a court order and a showing of probable cause that indicates that the information contained on the servers contains evidence of a crime. All information stored on serv-

---

<sup>267</sup> *Id.*

<sup>268</sup> *Id.* at 18–19. Note that, although I argue the information gathered should be exempt from sunshine act requests, the transparency recommendations below contend that the *fact* of collection and the government's use of aerial surveillance technology should be subject to transparency and accountability reforms and heightened oversight. See *infra* Section IV.D.



ers should be automatically deleted after a period of time so that the government does not maintain a long term archive of information about individuals. That period of time may be as short as 120 days, but should not be longer than five years.<sup>269</sup>

As with prior proposals, these limits are general guidelines with inherent policy trade-offs. A jurisdiction may value law enforcement prerogatives over privacy and may choose to place a greater emphasis on having data accessible for longer periods of time without a showing of cause and might replace the thirty-day limit with a sixty-day limit. That decision might enhance the value of aerial surveillance data to law enforcement, but it would also impose a civil liberties cost. Those types of decisions are best calibrated at the local level where legislators can gauge their particular crime levels and their constituents' desires for privacy.<sup>270</sup>

#### *D. Adopt Transparency and Accountability Measures*

Regardless of whether legislators follow the recommendations in this Article or choose to follow the ill-conceived warrant-based approach, transparency and accountability measures should be required for government use of aerial surveillance devices and the retention of collected imagery. "Transparency and accountability measures may be more effective than suppression rules or warrants for controlling and deterring wrongful government surveillance. To hold law enforcement accountable, legislators should mandate that the use of all aerial surveillance devices (manned or unmanned) be published on a regular basis (perhaps quarterly) on the website of the agency operating the system."<sup>271</sup>

Publishing usage logs encourages accountability, as does publishing detailed information about who operated the system, when it was operated, where it was operated (including GPS coordinates), and what was the law enforcement purpose for the operation.<sup>272</sup> To further leverage the benefits of technology in the public interest, legisla-

---

<sup>269</sup> *Id.* at 19.

<sup>270</sup> I say "might" enhance the law enforcement value because as the amount of data increases, law enforcement will face challenges analyzing that data. *Cf.* Sandra I. Erwin, *Too Much Information, Not Enough Intelligence*, NAT'L DEF. MAG., May 2012, at 26, 28 (explaining that "avalanches of data" created by military aircraft, sensors, and ISR platforms are never fully analyzed and converted into intelligible reports because there is not enough manpower and automated analysis algorithms are not yet functional).

<sup>271</sup> McNEAL, *supra* note \*, at 19.

<sup>272</sup> *Id.*

tors may even mandate that unmanned systems operating in their jurisdictions come equipped with software that allows for the easy export of flight logs that contain this information. Exporting logs in an easily readable format will allow privacy advocates and concerned citizens to closely monitor how aerial surveillance devices are being used, enabling the political process as a check that will hold government operators accountable.<sup>273</sup>

Granted, such a transparency-focused approach may impose costs on law enforcement, and accordingly, legislators should make efforts to allow the agency operating the drone to keep their usage logs confidential until the investigation is closed. However, the agency should be required to make the logs public within thirty days of the close of an investigation. To facilitate public accountability legislators should mandate that agencies publish all logs in an “open and machine-readable format consistent with the President’s Executive Order of May 9, 2013.”<sup>274</sup>

There is anecdotal evidence suggesting that a “flight log” approach works. For example, in the United Kingdom police departments published their helicopter flight logs on their webpage, with some even live-tweeting their helicopter’s activities.<sup>275</sup> Public watchdog groups in the United Kingdom have cropped up to take advantage of this transparency: they monitor police activity, with some even solely focusing on monitoring the activity of police helicopters.<sup>276</sup> “These groups, and their respective websites, act as [ ] forum[s] for noise and privacy complaints from various individuals across the [United] Kingdom, and several of these groups organize and lobby Members of Parliament [ ] to pass legislation restricting helicopter flyovers.”<sup>277</sup> The advocacy that these groups generate “appear[s] to be largely responsible for the recent trend of many UK police departments publishing their helicopters’ flight logs, or even creating Twitter

---

<sup>273</sup> *Id.* at 19–20.

<sup>274</sup> *Id.* at 20; see Exec. Order No. 13,642, 78 Fed. Reg. 28,111 (May 9, 2013), <http://www.whitehouse.gov/the-press-office/2013/05/09/executive-order-making-open-and-machine-readable-new-default-government->.

<sup>275</sup> McNEAL, *supra* note \*, at 20; see *UK’s Suffolk Police Helicopter Unit Now on Twitter*, HELIHUB (Sept. 3, 2012), <http://helihub.com/2012/09/03/uks-suffolk-police-helicopter-unit-now-on-twitter/>.

<sup>276</sup> McNEAL, *supra* note \*, at 20; see, e.g., *Our Aims*, HELICOPTER NOISE COAL., <http://www.helicopter-noise.org.uk/> (last updated Oct. 28, 2007).

<sup>277</sup> McNEAL, *supra* note \*, at 20; see Julian Huppert et al., *Early Day Motion 394: Helicopter Flights over London*, UK PARLIAMENT (July 14, 2012), <http://www.parliament.uk/edm/2012-13/394> (calling on government to introduce legislation to regulate and reduce amount of noise pollution caused by nighttime police helicopter flyovers in London).

accounts for their helicopters that publish real-time or delayed-time updates of the aircraft's activity."<sup>278</sup>

It appears that helicopter Twitter accounts<sup>279</sup> have become a growing trend amongst British police departments, and have had an immediate and powerful effect on public relations in their respective jurisdictions. "In Islington, the police department went from struggling to handle the overload of noise complaints relating to the department's use of its helicopter to receiving no complaints after the creation of its Helicopter Twitter feed."<sup>280</sup> The department reflected on the effectiveness—as well as future potential—of the Twitter feed by issuing this statement:

Maybe that is all people wanted—just to know and understand what we were doing. We don't update people in real time, but my vision is that soon we will be able to let people know about an operation as soon as it is over. In some cases we could get them to help—imagine if an elderly person with Alzheimer's was missing in Islington, we could Tweet our followers to keep an eye out.<sup>281</sup>

Another police department in Suffolk launched its Twitter feed as public outreach. One observer with the Suffolk Police, described the department's intentions in the following way:

We hope to use the Twitter feed to highlight the positive work being done by the Air Operations Unit and to keep members of the public informed as to why the helicopter has been deployed. We hope people will enjoy finding out more about the Unit and hopefully our tweets will give some explanation as to why we have been deployed and give some interesting insights into a very important policing tool.<sup>282</sup>

---

<sup>278</sup> McNEAL, *supra* note \*, at 20. Not all activity is published. The Cleveland (UK) Police Department's website indicates that "[t]his page is intended to provide basic information to the general public regarding the work of the police helicopter and will be updated on a daily basis. Weekend and public holiday updates will appear on the next working day. . . . Please note that not all items are always listed due to operational sensitivity or ongoing investigation." *Helicopter Watch*, CLEVELAND POLICE (UK), <http://www.cleveland.police.uk/news/helicopter-watch.aspx> (last visited Feb. 26, 2016).

<sup>279</sup> See, e.g., @MPSinthesky, TWITTER, <https://twitter.com/MPSinthesky>.

<sup>280</sup> McNEAL, *supra* note \*, at 20–21; see also Jon Dean, *Police Helicopter Twitter Account Stops Islington Complaints*, ISLINGTON GAZETTE (Feb. 12, 2012, 11:20 AM), [http://www.islingtongazette.co.uk/news/police\\_helicopter\\_twitter\\_account\\_stops\\_islington\\_complaints\\_1\\_1206725](http://www.islingtongazette.co.uk/news/police_helicopter_twitter_account_stops_islington_complaints_1_1206725).

<sup>281</sup> Dean, *supra* note 280.

<sup>282</sup> McNEAL, *supra* note \*, at 21; see Suffolk Police, *UK's Suffolk Police Helicopter Unit Now on Twitter*, HELIHUB (Sept. 3, 2012), <http://helihub.com/2012/09/03/uks-suffolk-police-helicopter-unit-now-on-twitter/>.

This anecdotal evidence suggests that the practice of disclosing nonsensitive flight logs through a public channel—such as a department web page or through Twitter—can be a useful tool in reassuring the public that law enforcement’s helicopters are engaged in legitimate law enforcement activity. The very idea of drones—of any kind—flying above American cities and towns might be foreboding to many lay persons, but by requiring law enforcement to regularly publish data or logs, legislators can add a citizen-centric political check on government surveillance. Such a data-and-innovation-driven approach to public awareness may help quell the fears of a society that is not yet certain how it should react to the increasing presence of aerial surveillance devices over the skies of America.

### *E. Institutionalized Oversight*

State and local government may also want to create oversight boards modeled after the federal Privacy and Civil Liberties Oversight Board.<sup>283</sup> The local board could comprise appointees drawn from the community. Such a surveillance oversight board could have a cross-section of civil liberties and law enforcement-minded individuals who could conduct audits of surveillance activities. Such audits might include reviewing data that was collected, checking for compliance with accountability procedures, or searching for areas where discriminatory targeting may be occurring.

Independent oversight bodies can provide policymakers with a transparent means to ensure accountability and expose wrongdoing, but they may also deter wrongdoing.<sup>284</sup> If police departments know that an oversight board will be auditing their activity, it may convince them to live up to the expectations and standards embedded in the law.<sup>285</sup> This, of course, assumes that policymakers want to change the status quo, but the amount of drone-related legislation proposed in various jurisdictions suggests that legislators are in fact interested in making changes.<sup>286</sup> Moreover, the intense public interest in the issue

---

<sup>283</sup> The Privacy and Civil Liberties Oversight Board is an independent agency that analyzes and reviews policies proposed and actions taken by the executive branch to protect the country from terrorism. 42 U.S.C. § 2000ee(a), (c) (2012). The Board is composed of a chairman and four additional members, chosen in part for their expertise in the area of civil liberties. *Id.* § 2000ee(h). The Board may never have more than three members of the same political party. *Id.* § 2000ee(h)(2).

<sup>284</sup> For a lengthier discussion of accountability, see Gregory S. McNeal, *Targeted Killing and Accountability*, 102 GEO. L.J. 681 (2014).

<sup>285</sup> ROBERT D. BEHN, *RETHINKING DEMOCRATIC ACCOUNTABILITY* 14 (2001).

<sup>286</sup> For a discussion of the status quo, see FRANK R. BAUMGARTNER ET AL., *LOBBYING & POLICY CHANGE: WHO WINS, WHO LOSES, AND WHY* 43 (2009) (“Even if policy makers recog-

suggests that there are many incentives for elected officials to exercise greater oversight over drone surveillance, as there is substantial interest group advocacy associated with the topic. However, while legislators may have interest in the topic, they may not have the time or resources to exercise intense oversight. A dedicated oversight board could specialize in overseeing surveillance activities.

There are good reasons to believe independent oversight of surveillance might be quite successful. As legal scholars Eric Posner and Adrian Vermeule have pointed out, independent commissions can be established to review policies before and after the fact, and politicians might gain credibility by binding themselves to give the commissions authority along various dimensions.<sup>287</sup> Policymakers might promise to follow the recommendations of a commission and give power to a commission to review the success of policy choices related to drones.<sup>288</sup> Independent oversight boards can be successful because they signal the interests of politicians in maintaining credibility and winning the support of the public, and a willingness to make information available that could subject the government to criticism.<sup>289</sup> Independent oversight boards allow politicians to claim they are holding law enforcement accountable while at the same time shifting the blame for poor accountability decisions to others—this ensures that politicians can exercise oversight without needing to fear blowback from powerful law enforcement unions.<sup>290</sup>

The first challenge associated with such an approach is to ensure that police provide surveillance information to the oversight board, which requires it to be empowered by law. Second, for an oversight board to be successful from the outset, it requires political support. A

---

nize that the policy is imperfect or the result of an error . . . it may still be a hard sell to convince others, especially those in leadership positions, that the current policy is working so badly that it must be overhauled. This threshold effect means that the vast majority of policies do not change at all. . . . [F]or most issues most of the time, individual policy makers fight an uphill battle to reframe their issues.”); Gregory S. McNeal, *The Status Quo Bias and Counterterrorism Detention*, 101 J. CRIM. L. & CRIMINOLOGY 855, 882–83 (2011) (describing status quo bias in policymaking).

<sup>287</sup> ERIC A. POSNER & ADRIAN VERMEULE, *THE EXECUTIVE UNBOUND: AFTER THE MADISONIAN REPUBLIC* 141 (2010).

<sup>288</sup> *Id.*

<sup>289</sup> *Id.*

<sup>290</sup> For a discussion of the power of law enforcement unions, see generally HERVEY A. JURIS & PETER FEUILLE, *POLICE UNIONISM: POWER AND IMPACT IN PUBLIC-SECTOR BARGAINING* (1973); David Alan Sklansky, *Not Your Father's Police Department: Making Sense of the New Demographics of Law Enforcement*, 96 J. CRIM. L. & CRIMINOLOGY 1209 (2006), 1229–34 (2006); Michael Tracey, *The Pernicious Power of the Police Lobby*, VICE (Dec. 4, 2014), <http://www.vice.com/read/the-pernicious-power-of-police-unions>.

failure on the part of politicians to empower an oversight board may engender political fallout for the policymakers who established the oversight board, but only if the commissioners have a means to communicate their lack of empowerment. The board, once appointed, may operate as independent investigators who will have an interest in ensuring they are not stonewalled. However, because these members will be appointed by politicians with their own agendas or the board members themselves may have political ambition, the individuals chosen may have reasons to want to avoid exposing abusive surveillance practices that might create political enemies amongst law enforcement. That reality may temper the success of an independent oversight board, but these challenges are inherent in any form of oversight (for example, local elected judges who approve warrant applications are not immune from these influences).

### CONCLUSION

The emergence of drones in domestic skies raises understandable privacy concerns that require careful and sometimes creative solutions. The smartest approach—one that balances innovation and privacy—is one that does not disrupt the status quo. Such an approach requires five key components.

This Article argued that scholars and legislators should move beyond a warrant-based, technology-centric approach to protecting privacy from aerial surveillance. Such an approach is unworkable, counterproductive, and may stifle efforts to enact more privacy-protective legislative regimes. Instead, legal reform proposals should focus on excluding low-altitude flights and surveillance, coupled with imposing limits on persistent surveillance, requiring enhanced accountability procedures for data retention and access, and creating new transparency and accountability measures. This Article took the counterintuitive position that technology may make unmanned aerial surveillance more protective of privacy than manned surveillance.

Specifically, this Article made five core recommendations. First, landowners should have the right to exclude aircraft, persons, and other objects from a column of airspace extending from the surface of their land up to 200 feet above ground level. Such an approach is a necessary, albeit insufficient solution aimed at addressing low-altitude overflights and surveillance. However, it is only a stopgap measure, as sophisticated surveillance technology continues to evolve and will eventually allow for high-quality surveillance from longer distances. Second, to address the threat of persistent surveillance of particular

individuals, this Article argued that legislators should craft simple, duration-based surveillance legislation that will limit the aggregate amount of time the government may surveil a specific individual. Third, to address the possibility that drones and other sophisticated aerial surveillance technology will allow the government to build a comprehensive picture of an entire community's daily movements (a different persistent surveillance harm), governments should mandate data-retention procedures that require heightened levels of suspicion and increased procedural protections for accessing stored data gathered by aerial surveillance, coupled with a requirement that data be deleted after a legislatively mandated period of time. Fourth, governments should impose enhanced transparency and accountability measures, requiring agencies to regularly publish information about the use of aerial surveillance devices (both manned and unmanned) and should consider creating local oversight boards to police the use of surveillance technologies. Fifth, legal reformers should recognize that technology such as geofencing and auto-redaction may make drone surveillance more protective of privacy than human surveillance.

Outright bans on the use of drones and broadly worded warrant requirements that function as the equivalent of an outright ban do little to protect privacy or public safety and in some instances will only serve to protect criminal wrongdoing. Legislators should instead enact legislation that maintains the current balance between legitimate surveillance and individuals' privacy rights. The best way to achieve that goal is to follow the five recommendations set forth in this Article.