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WRITTEN STATEMENT OF STEPHEN E. HENDERSON

Chairman Barrington, Vice Chair Brooks, members of the Committee on Public Safety, Senators, and distinguished guests, I am grateful for the opportunity to speak to you today about unmanned aerial systems, or drones, and more particularly about their federal constitutional implications and what might be the constitutional restrictions on any legislation you might like to enact. I am the Judge Haskell A. Holloman Professor of Law at the University of Oklahoma, where my teaching and research focus on criminal law and procedure and privacy, including the constitutional rights pertaining thereto.

My topic is not an easy one. The constitutional law is partially in flux and otherwise uncertain, and the technology is novel. This much you probably already know. Three colleagues and I last year published an article on these topics, *Regulating Drones Under the First and Fourth Amendments*, which is available online for reference.[1] It, however, is a dense ninety four pages in length, and even then cannot get to the level of concrete guidance I hope to give today. So, I will do my best to make a very complex set of topics manageable and helpful, without sacrificing so

[1] In order to interrupt the text as little as possible, all citation references are included in an Appendix keyed to page number.

much that they become meaningless. Ultimately, there is sufficient uncertainty that you could, with fealty to the federal constitutional rights of Americans, legislate a great many restrictions that may or may not ultimately stand up in the courts. We just cannot be certain. But hopefully I can at least provide a sense of the directions in which those rights push, why they do so, and the tradeoffs different legislative choices would make.

I. Our Federal and State Constitutions

I will speak of two constitutional rights today, and I cannot overstate their importance. Indeed, one could give a far worse definition of what it means to be an American than this: to enjoy the privileges of the First and Fourth Amendments to the United States Constitution. These two rights, as much as any others, prevent America from ever becoming a police state. They are what guarantee our liberty, our dignity, our autonomy, our very humanity. They are some of the most foundational freedoms of Americans.

And because to date the Oklahoma courts have interpreted the relevant provisions of the Oklahoma Constitution in "lockstep" with these federal rights—meaning that for now the Oklahoma protections identically track the holdings of the United States Supreme Court—we can limit our discussion to the federal provisions.

II. The Fourth Amendment

Let's begin with the Fourth Amendment, which provides that "the right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated." The Amendment goes on to restrict when warrants shall issue, because at the time of our founding, the colonial courts would issue general warrants that permitted the

constable to search in *every* home—wherever he saw fit—for anything from customs violations to allegedly stolen sheep. That could no longer happen in America, for "no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized."

For thousands of years governments had laws directed towards a person's home "being her castle," meaning she could keep everyone out...except for the State. The brilliance of the American revolution was to flip this on its head: the Fourth Amendment would keep out *especially* the State. I often say there is nothing more American than distrust of government—love of liberty is in our core. Thus, the Fourth Amendment restricts only the police and other state actors; it has no bearing on private citizens or businesses not acting as government agents.

Over the years, however, the United States Supreme Court has developed an underappreciated but critical link between the activities of American citizens and the constitutional restraints on state actors. It may not be the whole of the Fourth Amendment,[2] but it is a critical part, and it goes something like the following. The Fourth Amendment prohibits *unreasonable* searches. Since my neighbors cannot come in my home without my permission, it is *reasonable* for me to expect privacy there: in Supreme Court-speak, I have a reasonable expectation of privacy. Thus, neither law enforcement nor the fire department nor a city health inspector can enter my home without justification—unjustified entry would violate my reasonable expectation of privacy and would therefore be constitutionally unreasonable. Hence, absent a warrant, consent, emergency aid, or probable cause plus exigent circumstances, police must stay out of my home.

So, can police fly a helicopter or plane over my home in order to find what I am doing in my backyard? Yes, held the Supreme Court, so long as not only *can* private citizens do the same—

[2] For example, it matters that time immemorial the home has been a private space, and thus it might need to continue so against the government even if social norms and positive laws changed vis-a-vis other citizens.

the flight was according to FAA regulations—but private citizens *do* so fly. In that circumstance, I cannot reasonably expect privacy therefrom. So, can police without a search warrant aim a thermal imaging camera at my home from a public street to determine the heat emanating therefrom? No, held the Supreme Court, at least so long as private citizens do not do the same. Can police without a search warrant track the location of my vehicle for a month? No, held the Supreme Court, because private citizens might watch my driving for a short time, but certainly not for a month. Can police without a search warrant walk a drug sniffing dog up to my front door? No, held the Supreme Court, because private citizens might approach and knock, but they would not bring such a dog.

So, what does all this mean for drones?

A. Drones Under the Fourth Amendment

Hopefully you now see that whether police drone flight will be restricted by the Fourth Amendment depends in very significant part—if not entirely—on how private persons fly their drones. If you and I, acting as private citizens, fly our drones over each others' houses, then how can we have a reasonable expectation of privacy against such flight? How would our privacy or security meaningfully change when the sheriff adds her quadcopter to the mix? On the other hand, if you and I *don't* so fly our drones, then it *is* reasonable to expect privacy, and unrestricted government flight would seem unreasonable, especially since we have no tradition or history of such flight.

So, the Fourth Amendment restriction on government drone flight depends principally—if not entirely—upon private drone flight. What does this mean for you?

B. Getting Practical: Legislation

First, you should realize that you are constitutionally permitted to place *any* restriction on government drone flight, including *any* restriction on law enforcement drone flight. This includes a complete ban thereof. The Oklahoma legislature is always free to place additional restriction upon law enforcement, above or beyond that required by the federal and state Constitutions. So, such restrictions are entirely up to you.

Second, if the Fourth Amendment restricts drone flight, in some sense you need not legislate that same restriction—government actors are already constitutionally bound. However, I would recommend that you seriously consider such legislation. The Fourth Amendment is necessarily vague, and its precise contours as to drone flight will likely not be known for many years until it is slowly developed largely from criminal defendants litigating motions to suppress evidence. There is benefit in your providing clarity to Oklahoma law enforcement and other government actors, and also in providing a state cause of action where they exceed those defined limitations.

Third, I recommend that you exercise caution in restricting state actors more than the federal Constitution requires—you should have good reason for forcing only law enforcement to shield its eyes. If everyone else can fly in a certain manner, the burden should be on those urging any limitation prohibiting law enforcement from doing the same. We must be careful to compare apples to apples—that a teenager might fly a drone quickly over my home would say nothing about whether a government could set up an interconnected network of hovering drones with gigapixel cameras. But so long as we are comparing apples to apples, we would typically not want to overly restrict those seeking to keep us safe and well.

Therefore, I am recommending, in essence, that if you pass a law saying "private persons cannot do X with drones," you also pass a law saying "government actors cannot do X with drones absent a judicial warrant or other adequate justification." Let us therefore turn to what 'X' you could constitutionally legislate.

III. The First Amendment

The First Amendment provides a critical panoply of rights, including that "Congress shall make no law ... abridging the freedom of speech, or of the press." Like the Fourth Amendment, its protections restrict the states via the Due Process Clause of the Fourteenth Amendment. And again like the Fourth Amendment, this freedom of speech is fundamental to our American identity. In the words of Justice Hugo Black, "The First Amendment provides the only kind of security system that can preserve a free government—one that leaves the way wide open for people to favor, discuss, advocate, or incite causes and doctrines however obnoxious and antagonistic such views may be to the rest of us." And from Justice Brandeis, "Those who won our independence ... believed liberty to be the secret of happiness and courage to be the secret of liberty. They believed that freedom to think as you will and to speak as you think are means indispensable to the discovery and spread of political truth; that without free speech and assembly discussion would be futile; ... that the greatest menace to freedom is an inert people; that public discussion is a political duty; and that this should be a fundamental principle of the American government."

Thus, freedom of speech is fundamental, rich, and—alas—legally complicated. While rights to *expression* tend to trump privacy concerns outside of certainly narrowly defined categories (such as defamation law that prohibits libel and slander), rights to *acquisition* of information that might later be expressed are commonly limited (such as legal prohibitions on

trespass and wiretapping). But of course the importance of acquisition cannot be overstated: if information cannot be acquired, it cannot be expressed.

A. Drones Under the First Amendment

There are rare instances in which drone flight might itself be the expression. For example, in 2014, Cirque du Soleil released a video in which quadcopters bring lampshades to life in an electrician's laboratory, and a drone could pull a sign like some airplanes do along our nation's beaches or, presumably, write a message with smoke. But much more common will be a drone used to acquire information, from visual imagery to sound to infrared waves—which is of course a concern when drones fly over property belonging to another. Another concern is that the drone will lose signal or otherwise crash, harming persons or property.

For many years, the Federal Aviation Administration—or FAA—has exercised comprehensive control over airspace safety. Thus, state and local laws that would restrict aviation, even regarding traditionally local matters—for example, limiting the noise of airports—are often found to be preempted by federal law. But it is quite a different thing altogether when the FAA attempts to regulate the "airspace" three feet above my back lawn on the theory that an "aircraft," in this case a small quadcopter drone, could take off and fly there. It has always been primarily up to state and local law, if any, to regulate the activities of my home and yard, and the FAA has recently recognized a place for state and local drone law. Moreover, the FAA has never considered airspace privacy in any meaningful sense, and nor has any other federal regulatory agency. Again, to the extent there are legal restrictions—peeping tom laws and laws restricting intrusions into seclusion—they have been local laws.

Do we need privacy laws? Like never before. Americans rightly fear for our seemingly ever-shrinking islands of privacy. Data mining of our social networking profiles can better predict our personality and personal problems, including substance abuse, than our real-life friends. Our mobile phone providers know not only where we have been, but—because location is 93% predictable—where we will be. One company has built a profile of every American adult: home address, what politicians you donate to, what you spend on groceries and other necessities of life, where you tend to spend it, and when. Most of us do not even want to think about what Google might be able to discern about even our subconscious tics. Yes, we love Google Maps and Amazon delivery, but at least a part of us fears what we unwittingly give away with every click—not just where we might be going and what we might be buying, but everywhere we even *consider* going and everything we even *consider* buying. I could go on and on—from the automobile that used to be anonymous to the insurance company and car manufacturer that track your every acceleration, from the cash that used to be anonymous to the credit and store loyalty cards that track your every purchase, from the television that used to be anonymous to the cable company that tracks everything you even browse.

So, what to do when the constitutional right to acquire information runs into the core aspects of information privacy that are fundamental to our personal development, societal relations, and even democratic participation? This is not easy, and for the most part the law is simply not yet declared. Over the last decade courts have begun to articulate a constitutional right to record, but so far it has been limited to the recording of police in the public performance of their duties—the easiest case. And it has not yet considered recording from the air.

Therefore, when it comes to legislation you might enact restricting private drone flight—and thereby restricting information gathering via private drone flight—I can give only a spectrum of possibilities from which you might select.

B. Getting Practical: Drone Legislation Spectrum

This spectrum runs from the least speech protective but most privacy protective on one end to the most speech protective but least privacy protective on the other. The left end of the spectrum is not at all favorable to drone business; the right is. The left end of the spectrum is more subject to claims of federal preemption; the right less so. I cannot guarantee everything on the left end of the spectrum will ultimately pass constitutional review. But nor can I say that it will not.

1. Least Speech Protective But Most Privacy Protective

A legislature might decide that for reasons of safety and privacy, all nonconsensual drone image gathering over privately owned property should be prohibited. And, because it is the information gathering that is of First Amendment interest and therefore protection, it would seem of no *additional* First Amendment concern if all nonconsensual drone flight was therefore prohibited, which further protects safety.

What of such a ban over public properties? Over some properties, which are considered limited public forums, drone flight is incompatible with the property's purpose, such as over a jail or airport. Thus, such a ban would be constitutional. But a ban over traditional public forums, such as streets, sidewalks, and parks, would be the most constitutionally suspect—these places are time immemorial reserved for First Amendment activity. Yet where the motivations are safety and privacy—aspects of which can exist and even thrive in traditional public spaces—and where

the First Amendment activity is not a traditional one and arguably runs against other First Amendment interests like anonymity and freedom of association, little is certain.

But a ban on all nonconsensual drone flight would surely be subject to federal preemption, because Congress has mandated that the FAA incorporate drones into our national airspace system. So, it would seem that the most plausible proposal on this end of the spectrum would be (1) a ban on nonconsensual drone flight over private property below a certain height threshold (for example, 200, 250, or 300 feet), (2) a ban on nonconsensual information gathering—or on certain nonconsensual information gathering—over private property, (3) a ban on drone flight over certain specified public properties, and (4) perhaps a restriction on nonconsensual drone flight over other persons on public property.

Thus, a statute might read something like the following:

> A person commits an aerial trespass if—
> (a) Without express permission of the owner of private real property [where "real property" is merely lawyer-speak for land], he or she operates an unmanned aircraft less than 250 feet above ground level within the airspace overlaying that real property; or
> (b) Without express permission of the owner of private real property, he or she operates an unmanned aircraft and thereby captures images or information regarding that real property, including but not limited to visual images or sound recordings, and including any information regarding the airspace over that property from ground level to 200 feet;[3] or
> (c) He or she operates an unmanned aircraft within the airspace overlaying [certain designated properties]; or
> (d) He or she operates an unmanned aircraft less than 250 feet above ground level and within the airspace above a person without that person's express permission.

[3] It is critical to note that the ability to gather at least certain types of information within some range of the drone will almost certainly be necessary for safe flight.

Even this rather exhaustive first end of the spectrum is not truly exhaustive—a law could, for example, prohibit the nonconsensual following of a particular person by drone. Most often, however, it will be best to pass technologically-neutral laws designed to stop the unwanted behavior in all of its forms, here some form of stalking. It might, however, be necessary to update those laws to account for this new technology.

2. A Step to the Right: More Speech Protective But Less Privacy Protective

One step more respective of First Amendment interests—and therefore more likely to be constitutionally upheld—and one step more conducive to the developing drone industry, would be the same 250-foot flight limitation, but a more narrow image-gathering limitation.

Thus, a statute might read something like this:

> A person commits an aerial trespass if—
> (a) Without express permission of the owner of private real property, he or she operates an unmanned aircraft less than 250 feet above ground level within the airspace overlaying that real property; or
> (b) Without express permission of the owner of private real property, he or she operates an unmanned aircraft less than 250 feet above ground level and thereby captures images or information regarding that real property, including but not limited to visual images or sound recordings, and including any information regarding the airspace over that property from ground level to 200 feet;[4] or
> (c) Without express permission of the owner of private real property, he or she operates an unmanned aircraft and thereby captures images or information regarding that real property, including but not limited to visual images or sound recordings, by use of magnifying sensory enhancements such as telephoto lenses or parabolic microphones; or

[4] This accounts for the ability of a drone hovering over property A to photograph property B.

(d) He or she operates an unmanned aircraft within the airspace overlaying [certain designated properties]; or

(e) He or she operates an unmanned aircraft less than 100 feet above ground level and within the airspace above a person without that person's express permission.

3. Another Step to the Right: Even More Speech Protective But Still Less Privacy Protective

Another step more respective of First Amendment interests and more conducive to the developing drone industry, but less respective of safety and privacy interests, would be to (1) use the same 250-foot limitation, but only over residential property, (2) impose a durational limit of half an hour of flight per day over residential property, and (3) restrict image gathering to cameras without telephoto or other sense-enhancing capabilities. This is much more respective of First Amendment interests, and I would imagine would make the drone industry far more happy. However, notice there is a very real privacy cost—if fifty different drone operators hover their drone over your home at 300 feet for half an hour a day, that would effectively mean pervasive surveillance. And, as I have drafted it, there is no restriction on flight over nonresidential property, though of course we could draft a third step that did differently by retaining the uniform 250-foot buffer.

A statute might read something like this:

A person commits an aerial trespass if—

(a) Without express permission of the owner of residentially zoned property, he or she operates an unmanned aircraft less than 250 feet above ground level within the airspace overlaying that real property; or

(b) Without express permission of the owner of residentially zoned property, he or she operates one or more unmanned aircraft within the airspace overlaying that real property for more than 30 cumulative minutes in any one twenty-four hour period; or

(c) Without express permission of the owner of private real property, he or she operates an unmanned aircraft and thereby captures images or information regarding that real property, including but not limited to visual images or sound recordings, by use of magnifying sensory enhancements such as telephoto lenses or parabolic microphones.

Such a statute could—or could not—once again include some limitations over certain public spaces or persons.

4. A Final Step to the Right: Most Speech Protective But Least Privacy Protective

One final step would follow laws and legal rules that depend upon vague but more narrow concepts, such as those that mimic the Fourth Amendment's language and therefore prohibit actions that intrude upon a "reasonable expectation of privacy," or those that prohibit conduct "offensive to a reasonable person." Sometimes, there is no better language possible. After all, a Constitution must withstand the changes of hundreds of years, and, as you well know, legislatures must try to predict every possible scenario in the nearer term. But better language is to be preferred whenever it is possible, because it provides far greater clarity, and there is no more important constitutional principle than that people should not have to guess at what the law is—especially, of course, the criminal law. Therefore, believing better alternatives available, I do not recommend such laws for drone flight. However, including such criteria would be yet another step in our spectrum, prohibiting not all image gathering but only *offensive* gathering, or *offensive* gathering of *familial activity*.

Finally, you can of course enact nothing, in which case the only restraints on drone flight will be those imposed by the FAA or by Congress—or perhaps by municipalities. The FAA has traditionally been very strict as to drone flight, because it takes its safety mission seriously. Thus, both the hobbyist rules and the new Part 107 "commercial" rules are quite restrictive,

including permitting flight only within operator line of sight, and the latter prohibiting flight over anyone not directly participating in the flight. However, the FAA does grant exemptions, and—more importantly—it has traditionally had no interest in protecting privacy. Perhaps that is changing. But unless and until it does, we should expect to see FAA regulations of drone flight become more relaxed over time. In short, as things stand, Oklahomans are right to look to you to protect their privacy interests when it comes to drone flight—which means at the very least you should keep abreast of changes in FAA rules.

IV. How To Select From the Spectrum

While I have a comparative advantage to most in understanding the constitutional law that we have discussed, I have far less, if any, comparative advantage in making the policy decision. But I suggest that you are going about this precisely right—hear from the private landowners, the drone industry, the media, advocacy organizations, and others, and decide what you deem best for the people of Oklahoma. No matter what decision you make, including the decision to do nothing at all, some will be unsatisfied. That is simply the nature of things.

I will conclude with a few quick final points.

V. What About That Fourth Amendment?

If you do legislate restrictions upon private drone flight, remember that I recommend you also restrict equivalent government drone flight. For example, as to law enforcement flight, you might ban that flight absent a warrant, consent, emergency aid (meaning a reasonable belief of imminent danger of death or serious physical injury), or exigent circumstances (meaning probable cause to fear imminent destruction of evidence or imminent suspect flight).

VI. What About Manned Aviation?

We have been talking solely about drones—what about the privacy risks from manned aviation? As I have mentioned, all else being equal, technologically neutral legislation is the best legislation. In other words, it is better to regulate stalking generically—which is, in one essence, repeatedly contacting or following a person in order to cause them to fear bodily harm—than to separately regulate stalking by car, stalking on foot, and stalking by email. But even that oversimplified example demonstrates there will be exceptions: there may be reasons to treat electronic stalking differently, from different harms it causes to different classes of perpetrators or victims to different barriers to criminal entry.

And so it is with drones versus manned aviation: manned aviation has relatively massive resource restraints that tend to prevent—or at least lessen—any privacy abuse. Drones do not. Therefore, it makes good sense to separately regulate drone flight and its impact on safety and privacy.

VIII. What About Prime Air?

Even as complicated as my presentation has been, we have only scratched the surface. Amazon would famously like to deliver packages by drone, and that's really, really cool. Even my civil-libertarian, privacy-fanatic kids think that's cool. We are ready to subscribe. But this will require complicated rules. For example, the customer will of course have provided consent to land in her yard, but I could imagine Amazon needing a significant 360-degree view around the drone during this descent, and in tight neighborhoods that might mean looking into adjacent yards. After all, if a child or dog begins to run at the drone from such a location, the landing might need to abort. And I can imagine Amazon needing to retain such landing video for a short

time, in case there are complaints or injuries. So, the law might permit such video but require insurance coverage, access restrictions, audit logs, and data destruction schedules. As I said, complicated rules.

But I would recommend that while you keep such innovation on your horizon, that you do not allow the perfect to be the enemy of the good. Amazon and other like companies have plenty of lawyers who will be ready and willing to bring you the legal changes they will need when that time comes. So, I'd say the trick is not to stifle innovation, but nor to allow potential future innovations to effectively prevent all safety and privacy protections.

Conclusion

As an Oklahoman, and as someone who has dedicated my life to teaching the fundamental rights of the constitutional criminal law, I appreciate your convening this study, and your requesting my input. I hope something here has been helpful, I thank you for your time, and I welcome your questions, in this or other fora.

Appendix: Sources by Page Number

1 which is available online for reference: Marc Jonathan Blitz, James Grimsley, Stephen E. Henderson, Joseph Thai, *Regulating Drones Under the First and Fourth Amendments*, 57 WM. & MARY L. REV. 49 (2015), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2574378.

3 The brilliance of the American revolution: *See* WILLIAM J. CUDDIHY, THE FOURTH AMENDMENT: ORIGINS AND ORIGINAL MEANING xiv (Oxford 2009).

4 police must stay out of my home: Payton v. New York, 445 U.S. 573, 586 (1980).

4 but private citizens *do* so fly: Florida v. Riley, 488 U.S. 445, 454 (1989) (O'Connor, J., concurring in the judgment and casting the critical fifth vote).

4 private citizens do not do the same: Kyllo v. United States, 533 U.S. 27 (2001).

4 but certainly not for a month: United States v. Jones, 132 S. Ct. 945, 954 (2012) (Sotomayor, J., concurring); *id.* at 957 (Alito, J., concurring in the judgment).

4 but they would not bring such a dog: Florida v. Jardines, 133 S. Ct. 1409 (2013).

6 In the words of Justice Hugo Black: Yates v. United States, 354 U.S. 298, 344 (1957) (Black, J., concurring in part and dissenting in part).

6 And from Justice Brandeis: Whitney v. California, 274 U.S. 357, 375 (1927) (Brandeis, J., concurring).

7 lampshades to life in an electrician's laboratory: SPARKED: A Live Interaction Between Humans and Quadcopters, https://www.youtube.com/watch?v=6C8OJsHfmpI.

7 harming persons or property: *See, e.g.*, J. David Goodman, *Remote-Controlled Model Helicopter Fatally Strikes Its Operator at a Brooklyn Park*, N.Y. TIMES (Sept. 5, 2013), http://www.nytimes.com/2013/09/06/nyregion/remote-controlled-copter-fatally-strikes-pilot-at-

park.html; Emanuella Grinberg & Vivian Kuo, *Enrique Iglesias Injured in Concert Mishap with a Drone*, CNN (June 2, 2015, 12:05 AM), http://www.cnn.com/2015/05/31/entertainment/enrique-iglesias-drone-feat/index.html; James Nye, *Fail! Photographer's Drone Smacks Groom in the Head as He Looked for the Perfect Shot*, DAILY MAIL (Aug. 16, 2013), http://www.dailymail.co.uk/news/article-2395933/Fail-Photographers-dronesmacks-groom-head-looked-perfect-shot.html.

7 preempted by federal law: See, e.g., City of Burbank v. Lockheed Air Terminal, Inc., 411 U.S. 624 (1973) (striking down an airport curfew).

7 But it is quite a different thing altogether: Federal jurisdiction over airspace has been confusing ever since the seminal case of *United States v. Causby*, 328 U.S. 256 (1946). One the one hand, the Court declared airspace a "public highway": "It is ancient doctrine that at common law ownership of the land extended to the periphery of the universe—cujus est solum ejus est usque and coelum. But that doctrine has no place in the modern world. The air is a public highway, as Congress has declared." *Id.* at 260-61. But at the same time, "it is obvious that, if the landowner is to have full enjoyment of the land, he must have exclusive control of the immediate reaches of the enveloping atmosphere." *Id.* at 264. Just where that crossover occurs is not clear, and the advent of drones has made it substantially less clear.

7 recognized a place for state and local drone law: *See New FAA Drone Rules Reject Federal Preemption of State and Local Drone Laws*, BUSINESS WIRE, June 22, 2016, http://www.businesswire.com/news/home/20160622006076/en/FAA-Drone-Rules-Reject-Federal-Preemption-State.

8 they have been local laws: *See, e.g.*, 21 Okla. Stat. § 1171(B) (peeping tom law).

8 Data mining of our social networking profiles can: *See* Clifton B. Parker, *New Stanford Research Finds Computers Are Better Judges of Personality Than Friends and Family*, STANFORD REP. (Jan. 12, 2015), http://news.stanford.edu/news/2015/january/personality-computer-knows-011215.html; Wu Youyou et al., *Computer-based Personality Judgments Are More Accurate Than Those Made by Humans*, 112 NAT'L ACAD. SCI. 1036, 1036–39 (2015), http://www.pnas.org/content/112/4/1036.full.pdf.

8 Our mobile phone providers know: *See* Chaoming Song et al., *Limits of Predictability in Human Mobility*, 327 SCIENCE 1018, 1021 (2010), http://www.barabasilab.com/pubs/CCNR-ALB_Publications/201002-19_Science-Predictability/201002-19_Science-Predictability.pdf; see also *Dr. Seldon, I Presume*, ECONOMIST, Feb. 23, 2013, at 76.

8 One company has built a profile: *See* David Gauvey Herbert, *This Company Has Built a Profile on Every American Adult*, BLOOMBERG BUSINESSWEEK, August 5, 2016, http://www.bloomberg.com/news/articles/2016-08-05/this-company-has-built-a-profile-on-every-american-adult.

10 into our national airspace system: FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 332(a)(3), 126 Stat. 11, 73.

13 offensive to a reasonable person: *See, e.g.*, Cal. Civ. Code 1708.8(b) (defining "constructive invasion of privacy").

14 Thus, both the hobbyist rules: For a simple resource see FAA, *Getting Started*, https://www.faa.gov/uas/getting_started/. The statutes, regulations, and other matter can also be found via the FAA's site.

14 traditionally had no interest in protecting privacy: See Nathan D. Taylor & Adam J. Fleisher, *Drone Privacy Issues Increase Washington's Focus*, LAWFUEL (Jan. 26, 2015)

http:/www.lawfuel.com/drone-privacy-issuesincrease-washingtons-focus (noting FAA articulation "that its mission 'does not include regulating privacy'").

14 Perhaps that is changing: *See* FAA, Press Release—DOT and FAA Finalize Rules for Small Unmanned Aircraft Systems, June 21, 2016, https://www.faa.gov/news/press_releases/news_story.cfm?newsId=20515 ("Although the new rule does not specifically deal with privacy issues in the use of drones, and the FAA does not regulate how UAS gather data on people or property, the FAA is acting to address privacy considerations in this area.").

15 And so it is with drones: *See* United States v. Jones, 132 S. Ct. 945, 963 (2012) (Alito, J., concurring in the judgment) (commenting on GPS tracking versus former alternatives).