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The Drones Are Coming!

WILL THE FOURTH AMENDMENT STOP THEIR THREAT TO OUR PRIVACY?

Robert Molko[†]

INTRODUCTION

In recent years, the use of drones in military operations has become very public. But what is not as well known is that local law enforcement agencies are now using drones¹ and plan to expand their use to conduct surveillance of communities for criminal activity.²

Today, in the twenty-first century, our privacy seems to have been eroded virtually to the point of nonexistence.³ We

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¹ "In five days, the Unmanned Applications Institute International can teach a cop how to use a drone the size of a bathtub toy." Mark Brunswick, *Spies in the Sky Signal New Age of Surveillance*, STAR TRIB. (July 22, 2012, 6:26 AM), <http://www.startribune.com/local/163304886.html?refer=y>. "The University of North Dakota operates a fleet of seven different types of [drones]." *Id.* It "offer[s] a four-year degree in unmanned aircraft piloting." *Id.*

² See Catherine Herridge, *Government Plans for Drastic Expansion of Domestic Mini-Drones*, FOXNEWS.COM (Feb. 23, 2013), <http://www.foxnews.com/politics/2013/02/23/government-plans-for-drastic-expansion-domestic-mini-drones/>; see also David Pierce, *Mayor Bloomberg Says Surveillance Drones Are Inevitable in NYC: "Get Used to It,"* THEVERGE (Mar. 24, 2013), <http://www.theverge.com/2013/3/24/4141526/mayor-bloomberg-says-surveillance-drones-inevitable-in-nyc>; Carl Franzen, *Privacy Laws Can't Handle New Wave of Commercial Drones, Senate Hearing Concludes*, THEVERGE (Mar. 20, 2013), <http://www.theverge.com/2013/3/20/4127988/senate-worried-drones-for-commercial-police-violate-privacy/in/3759737>.

³ Advances in technology have been blamed for a lot of this loss of privacy. On the other hand, as Professor Simmons points out, technology has also enhanced privacy in our everyday lives, allowing us to communicate more privately (e.g., cell phones, emails, text messages, anonymizers), store data more privately ("cloud" remote electronic storage, encryption), and conduct a greater number of activities within the

have already lost substantial privacy in our cars, our cell phones, our business records, our bodies, and even in our homes.⁴ And now, law enforcement's adoption of drones threatens to further erode our right to privacy as they silently hover over our neighborhoods and monitor our every move. Will the U.S. Supreme Court and the Fourth Amendment stop this impending threat to our privacy?

The Fourth Amendment protects us from unreasonable intrusions by the government, and we have come to depend on that protection.⁵ Over the years, we have learned to cherish our privacy and shield it not only from governmental intrusion but also from everyone else if we so choose. Our privacy arguably represents our most cherished "possession."⁶ For more than forty years, courts have used the *Katz* "reasonable expectation of privacy"⁷ test to determine whether government conduct is constitutional. Both courts and scholars, however, have highly criticized this test when applied to advancing technology.⁸ Yet, the test still survives, and as this article will demonstrate, it will continue to survive as the applicable test of

privacy of our homes in the computer age. See Ric Simmons, *Why 2007 Is Not Like 1984: A Broader Perspective on Technology's Effect on Privacy and Fourth Amendment Jurisprudence*, 97 J. CRIM. L. & CRIMINOLOGY 531, 535-36 (2007).

⁴ We have lost most of our privacy to warrantless governmental intrusions due to the U.S. Supreme Court's creation of numerous exceptions to the Fourth Amendment's search warrant requirement. These exceptions continue to grow and expand all the time. This trend seems unstoppable. The Court has also found that many of the governmental intrusions are "reasonable" and therefore not in violation of the Fourth Amendment. At the same time, we have been subject to far worse intrusions by private individuals that are not governed by the Fourth Amendment (e.g., compromises of databases, hackers, insiders).

⁵ The U.S. Constitution does not explicitly delineate a right of privacy. Rather, it has been implied from the protections for "persons, houses, papers, and effects" under the Fourth Amendment. U.S. CONST. amend. IV. In 1965, the Court developed a separate basis of privacy out of what it called "penumbras, formed by emanations from [the Bill of Rights] guarantees that help give them life and substance." *Griswold v. Connecticut*, 381 U.S. 479, 484 (1965). Moreover, the Court has indicated that one aspect of the "liberty" protected by the Due Process Clause of the Fourteenth Amendment is "a right of personal privacy, or a guarantee of certain areas or zones of privacy." *Roe v. Wade*, 410 U.S. 113, 152 (1973). This latter concept of privacy is primarily used in relation to the right to abortion and issues involving consensual acts by adults in their own home. See *Lawrence v. Texas*, 539 U.S. 558 (2003).

⁶ As Justice Brandeis described it, the right of privacy is the "right to be let alone—the most comprehensive of rights and the right most valued by civilized men." *Olmstead v. United States*, 277 U.S. 438, 478 (1928) (Brandeis, J., dissenting).

⁷ *Katz v. United States*, 389 U.S. 347 (1967). The "reasonable expectation of privacy" test was initially proposed by Justice Harlan in his *Katz* concurrence. *Id.* at 361 (Harlan, J., concurring). However, it was adopted by the Court in subsequent decisions and has since been referred to as the *Katz* reasonable expectation of privacy. See *Kyllo v. United States*, 533 U.S. 27, 34 (2001); *California v. Ciraolo*, 476 U.S. 207, 211 (1986).

⁸ See *infra* Part II.

constitutionality under the Fourth Amendment in drone surveillance cases. Nevertheless, the test's continued use is not necessarily a foregone conclusion, as the Supreme Court may yet alter its manner of application.

Over the years, courts have permitted aerial surveillance from navigable airspace where civilian planes or helicopters routinely fly,⁹ although they have prohibited such surveillance if it occurred from unusually low altitudes.¹⁰ Today, however, advances in surveillance and optics technology have made it possible to detect very small objects from high altitudes.¹¹ In addition to these advances, stealth technology¹² enables drones to hover above us, silently monitoring everything we do in areas exposed to the sky.¹³ Drone technology, when carried to its extreme, threatens to destroy whatever vestiges of privacy remain in modern society, even in areas like a secluded, fenced-in backyard or private estate.

Many local law enforcement agencies have already begun implementing these aerial surveillance technologies. For example, the city of Lancaster, California recently began using aerial surveillance to monitor the city's neighborhoods.¹⁴ There, a plane will fly above the city for up to ten hours a day.¹⁵ "Drones are [also] being considered by [San Francisco] Bay Area law enforcement agencies as a cost-cutting way to replace helicopters . . . and use technology to fight crime and save lives."¹⁶ Moreover, North Dakota police recently used a drone to monitor activity on a ranch to determine when its occupants would be unarmed in order to avoid a violent shootout when

⁹ See generally *Florida v. Riley*, 490 U.S. 1014 (1989); *California v. Ciraolo*, 476 U.S. 207 (1986), discussed in detail in Part III.

¹⁰ See *Pew v. Scopino*, 904 F. Supp. 18, 27 (D. Me. 1995).

¹¹ See, e.g., *infra* notes 41-44 and accompanying text.

¹² See, e.g., *infra* notes 41-44 and accompanying text.

¹³ George Orwell saw it before any of us. "In the far distance a helicopter skimmed down between the roofs, hovered for an instant like a blue-bottle, and darted away again with a curving flight. It was the Police Patrol, snooping into people's windows." GEORGE ORWELL, 1984, at 2 (1949).

¹⁴ Abby Sewell et al., *Lancaster Takes to the Skies to Get a View on Crime*, L.A. TIMES (Aug. 25, 2012), <http://articles.latimes.com/2012/aug/25/local/la-me-0825-lancaster-aircraft-20120825>. The plane is equipped with a video camera. *Id.* This program is the equivalent of drone surveillance for the purpose of Fourth Amendment analysis because the plane's civilian pilot cannot see the encrypted video that is fed down to the police dispatch center. See *id.*

¹⁵ *Id.*

¹⁶ Stephanie Chuang, *Bay Area Law Enforcement Agencies Test Drones*, NBCBAYAREA.COM (Feb. 14, 2013, 2:53 PM), <http://www.nbcbayarea.com/news/local/Bay-Area-Law-Enforcement-Agencies-Test-Drones-173415551.html>.

apprehending the suspects.¹⁷ Police in Gadsden, Alabama, bought “a lightweight drone . . . to help in drug investigations.”¹⁸ Authorities in Tampa Bay, Florida, considered using drones for security surveillance at the 2012 Republican National Convention.¹⁹ The Montgomery County Sheriff’s Office in Texas has even considered arming a drone with rubber bullets and tear gas.²⁰ These represent only a small sampling of local law enforcement agencies that have begun to use drones.²¹

At the same time, two private software companies, Apple and Google, used aerial surveillance and military-grade cameras in a race to create detailed, three-dimensional images of city and residential streets throughout the world.²² These cameras are so powerful that “they can show objects just four inches wide” and “potentially see into homes through skylights and windows.”²³ Apple’s rush to outdo Google led to its catastrophic premature release of three-dimensional visual flyovers in Apple Maps in September 2012, which it has been trying to correct ever since.²⁴

¹⁷ Brian Bennett, *Police Employ Predator Drone Spy Planes on Home Front*, L.A. TIMES (Dec. 10, 2011), <http://articles.latimes.com/2011/dec/10/nation/la-na-drone-arrest-20111211>. On August 1, 2012, a North Dakota District Judge held that this drone surveillance was lawful. See Jason Koebler, *Court Upholds Domestic Drone Use in Arrest of American Citizen*, USNEWS.COM (Aug. 2, 2012), <http://www.usnews.com/news/articles/2012/08/02/court-upholds-domestic-drone-use-in-arrest-of-american-citizen>.

¹⁸ Brian Bennett, *Police Departments Wait for FAA Clearance to Fly Drones*, L.A. TIMES (Apr. 29, 2012), <http://articles.latimes.com/2012/apr/29/nation/la-na-drone-faa-20120430>.

¹⁹ W.J. Hennigan, *Idea of Civilians Using Drone Aircraft May Soon Fly with FAA*, L.A. TIMES (Nov. 27, 2011), <http://articles.latimes.com/2011/nov/27/business/la-fi-drones-for-profit-20111127>.

²⁰ *Groups Concerned Over Arming of Domestic Drones*, CBS DC (May 23, 2012, 1:18 PM), <http://washington.cbslocal.com/2012/05/23/groups-concerned-over-arming-of-domestic-drones> [hereinafter CBS DC].

²¹ In April 2012, the Federal Aviation Administration (FAA) released a list of police departments that have been issued Certificates of Authorizations (COAs) to fly drones domestically. See *FAA List of Certificates of Authorizations (COAs)*, ELEC. FRONTIER FOUND., <https://www EFF.ORG/document/faa-list-certificates-authorizations-coas> (last visited Feb. 8, 2013). Those departments include, among others, the FBI and local law enforcement agencies in Orange County; Miami-Dade; North Little Rock, Arkansas; Houston, Texas; Arlington, Texas; Seattle, Washington; Gadsden, Alabama; Georgia Tech; Ogden, Utah; and small cities and counties like Otter Tail, Minnesota, and Herington, Kansas. *Id.*

²² Vanessa Allen, *Beware the Spy in the Sky: After Those Street View Snoopers, Google and Apple Use Planes that Can Film You Sunbathing in Your Back Garden*, MAIL ONLINE (June 10, 2012, 7:04 AM), <http://www.dailymail.co.uk/sciencetech/article-2157150/Google-Apple-use-planes-film-sunbathing-garden.html>.

²³ *Id.*

²⁴ See Kyle Wagner, *Apple’s New 3D Maps Are an Apocalyptic Horror Show*, GIZMODO.COM (Sept. 19, 2012, 4:19 PM), <http://gizmodo.com/5944672/apples-new-3d-maps-turn-your-world-into-an-apocalyptic-horror-show>; *Apple Improving 3D Flyover*

On the legislative side, on February 14, 2012, President Obama signed into law the FAA Modernization and Reform Act of 2012.²⁵ This law requires the FAA to expedite the process of authorizing both public and private use of drones in the national navigable airspace.²⁶ This statutory mandate will inevitably reduce our privacy through increased aerial surveillance of neighborhoods and public places by law enforcement drones, bringing us ever closer to an Orwellian state.²⁷ Indeed, “[t]he government has predicted that as many as 30,000 drones will be flying over U.S. skies by the end of the decade.”²⁸ Some experts predict that those drones will be used by “journalists, police departments, disaster rescue teams, scientists, real estate agents, and private citizens.”²⁹

In the past, the constitutionality of aerial surveillance has begun with the proposition that a person cannot have a reasonable expectation of privacy for matters left exposed to the public.³⁰ However, there must be some meaningful limit on how far overhead surveillance of our neighborhoods can stretch before the invasion of privacy reaches constitutional proportions. Accordingly, the increasing prevalence of drone surveillance may provide the right impetus for the Supreme Court to draw such a limit, whether under its current “reasonable expectation” jurisprudence or perhaps under a different framework altogether.

In any event, the Court would have to consider the issue of drone surveillance in the context of *United States v. Jones*, which reviewed the constitutionality of using GPS to monitor the location of cars in public.³¹ Dicta in *Jones* indicate that although none of the Justices would be willing to abandon the reasonable expectation of privacy test, some of them may decide to adopt a different approach in applying it in certain

Visuals in iOS 6 Maps, APPLEINSIDER.COM (Oct. 5, 2012, 2:59 PM), <http://appleinsider.com/articles/12/10/05/apple-improving-3d-flyover-visuals-in-ios-6-maps>.

²⁵ FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, 126 Stat. 11.

²⁶ See S. Smithson, *Drones Over U.S. Get OK by Congress*, WASH. TIMES (Feb. 7, 2012), <http://www.washingtontimes.com/news/2012/feb/7/coming-to-a-sky-near-you/>.

²⁷ The “Orwellian state” refers to the surveillance state that George Orwell depicted in his novel, *1984*. See generally ORWELL, *supra* note 13.

²⁸ Brunswick, *supra* note 1. “Where aviation was in 1925, that’s where we are today with unmanned aerial vehicles The possibilities are endless.” *Id.* (quoting Al Palmer, Dir., Univ. of N.D. Ctr. for Unmanned Aircraft Systems Research, Educ. & Training).

²⁹ Jason Koebler, *The Coming Drone Revolution: What You Should Know*, USNEWS.COM (Apr. 5, 2012), <http://www.usnews.com/news/articles/2012/04/05/the-coming-drone-revolution-what-you-should-know>.

³⁰ *Katz v. United States*, 389 U.S. 347, 351 (1967).

³¹ *United States v. Jones*, 132 S. Ct. 945 (2012).

contexts in the future. In particular, as discussed below in Part IV, many of the Justices seem very concerned about warrantless governmental monitoring of persons in their day-to-day activities and appear willing to limit the extent of such law enforcement activity.

This article explores the ramifications of the *Jones* decision and its dicta suggesting that Fourth Amendment limitations could apply in the future in the context of drone surveillance of our neighborhoods. Importantly, while the Court's previous jurisprudence has primarily considered the *nature* of police observations, *Jones* provides insight for the first time on the permissible *duration*³² of such observations.³³ At the same time, however, because *Jones* focused only on monitoring activities occurring in *public places*, it provides only minimal insight on the issue of drone surveillance of the home or curtilage.³⁴ To bridge that gap, this article will also consider Supreme Court jurisprudence related to surveillance of those two areas.

Part I will introduce the FAA Modernization and Reform Act of 2012 and offer a discussion of the nature of current drone technology and how such technology could be used by law enforcement. Part II will provide a short overview of the manner in which the Fourth Amendment protects individuals from unreasonable governmental intrusion.³⁵ Part III will explore the scope of aerial surveillance and the use of other technologies that the Supreme Court has previously allowed under the Fourth Amendment. Part IV will analyze *Jones* and assess what the Justices' various opinions may foretell for the Fourth Amendment fate of drone technology surveillance. Finally, Part V will explore how the Court might apply the *Jones* rationales and current Fourth Amendment

³² The observations of the defendant's car in *Jones* lasted 24/7 for twenty-eight days. See *Jones*, 132 S. Ct. at 946; see also discussion *infra* Part IV.

³³ Previous jurisprudence focused on the type of observation (e.g., naked eye, photography, binoculars, or infrared technology). See discussion *infra* Part III.

³⁴ *Jones* does provide some indirect insight as to drone surveillance of the home and curtilage because the courts have traditionally held that the Fourth Amendment offers greater protection against the invasion of privacy in those areas than in public places. See discussion *infra* Part IV. Accordingly, if the Fourth Amendment would preclude some drone surveillance in public places, it would follow that similar protection would extend to the curtilage and the home.

³⁵ The issue of other potential constitutional rights violations, such as the First Amendment freedom of assembly, is a separate issue that is beyond the scope of this article. The issue of public safety related to possible collisions of drones with passenger planes or possible crashes to the ground of a drone is also beyond this article's scope. See, e.g., Chris Lawrence, *Navy Drone Crashes in Maryland*, CNN (June 11, 2012, 6:51 PM), <http://www.cnn.com/2012/06/11/us/maryland-drone-crash/index.html?hpt=hp%20t2t> (discussing a recent drone accident).

jurisprudence in the context of the inevitable drone invasion of our neighborhoods.

I. CURRENT DRONE TECHNOLOGY AND THE FAA MODERNIZATION AND REFORM ACT OF 2012

A brief preview of drone technology and recent legislation authorizing the use of drones will provide necessary context before considering the application of the Fourth Amendment to drone surveillance. Drones come in many shapes and sizes, ranging from as large as a commercial airplane³⁶ to as small as a hummingbird,³⁷ and many cost less than a helicopter.³⁸ Some drones' small size and light weight enable them to fit in the trunk of a car, and many are designed to be hand-launched by one person.³⁹ The following examples of existing drones provide some perspective on the breadth and adaptability of drone technology that law enforcement can use to conduct aerial surveillance:

- The pocketsize Nano Hummingbird has a wingspan of 6.5 inches, weighs 19 grams, and is equipped with a video camera.⁴⁰
- The Wasp Micro Air Vehicle has a wingspan of 2.4 feet, a length of 1.25 feet, and weighs 0.95 pounds.⁴¹
- The Wasp AE has a wingspan of 3.3 feet, a length of 2.5 feet, weighs 2.85 pounds, and is designed to be hand-launched.⁴²

³⁶ See W.J. Hennigan, *Air Force Buys Souped-Up, Stealthy Version of Predator Drone*, L.A. TIMES BLOG (Dec. 31, 2011, 10:19 AM), http://latimesblogs.latimes.com/money_co/2011/12/drone-general-atomics-air-force-.html.

³⁷ See W.J. Hennigan, *It's a Bird! It's a Spy! It's Both*, L.A. TIMES, Feb. 17, 2011, at B1, available at <http://articles.latimes.com/2011/feb/17/business/la-fi-hummingbird-drone-20110217> (describing the development by AeroVironment Inc. of the "Nano Hummingbird").

³⁸ A police helicopter can cost \$1.7 million, whereas a Qube drone only costs \$40,000. See Hennigan, *supra* note 19.

³⁹ See discussion *infra* notes 40-44. One can imagine two different uses for police drones: (1) a small drone in the trunk of a patrol car to be used by an unassisted officer for unplanned short periods of surveillance; and (2) a larger drone that can hover for long periods of time for a more complex planned surveillance.

⁴⁰ Hennigan, *supra* note 37. It is able to fly at speeds of up to eleven miles per hour and "can hover and fly sideways, backward and forward, as well as go clockwise and counterclockwise." *Id.*

⁴¹ *Wasp III*, AV AEROVIRONMENT, www.avinc.com/downloads/WASP-III_datasheet.pdf (last visited Feb. 10, 2013). The WASP Micro Air Vehicle has an operating altitude range from 50 to 1,000 feet. The WASP includes "live video downlink, self tracking, still photography and nighttime IR technology." It can be operated manually but is also capable of "GPS-based autonomous flight and navigation." *Id.*; see also Jennifer Lynch, *Texas Cancels Its Drone Program for Maintenance Issues*, ELEC. FRONTIER FOUND. (Jan. 24, 2012), <https://www.eff.org/deeplinks/2012/01/texas-department-public-safety-cancels-its-drone-program>.

- The Raven has a wingspan of 4.5 feet, weighs 4.2 pounds, and is designed to be hand-launched.⁴³
- The Qube weighs 5.5 pounds and can fit in the trunk of a car.⁴⁴
- The Boeing ScanEagle can fly at speeds of 139 kilometers per hour for up to 20 hours.⁴⁵
- The A160T Hummingbird is a large, 35-foot-long drone that can takeoff or land vertically and hover for 20 hours at 15,000 feet.⁴⁶

Due to their design, drones can carry various instruments that allow them to conduct stealth aerial surveillance for varying periods of time. For example, they can be equipped with still and video cameras, infrared cameras, heat sensors, and radar.⁴⁷ Drones can also carry tear gas or weapons.⁴⁸ In addition to conducting visual surveillance, drones have the electronic surveillance capability of using sophisticated instruments to measure infrared radiation emanating from houses, eavesdrop on cell-phone conversations and text messages by impersonating cell-phone towers, and spy on Wi-Fi networks through automated password cracking.⁴⁹ This article, however, focuses strictly on *visual* aerial surveillance.⁵⁰ In this context,

⁴² *Wasp AE*, AV AEROVIRONMENT, www.avinc.com/downloads/WaspAE.pdf (last visited Feb. 10, 2013). The WASP AE can fly at an altitude of 500 feet for 50 minutes. *Id.* It can be packed and carried by one person and is designed to be very quiet in order to avoid detection. *Id.*

⁴³ *U.S. Air Force Fact Sheet: RQ-11B Raven System*, www.avinc.com/downloads/USAF_Raven_FactSheet.pdf (last visited Feb. 10, 2013). The Raven has an operating altitude range from 100 to 500 feet. It can be used for low-altitude day- and night-surveillance. *Id.* It delivers real-time color or infrared imagery to ground control and remote viewing stations. *Id.* Although the single cost is \$35,000, the entire system costs \$250,000. *See RQ-11 Raven Unmanned Aerial Vehicle, United States of America*, ARMY-TECHNOLOGY.COM, <http://www.army-technology.com/projects/rq11-raven/> (last visited Apr. 2, 2013).

⁴⁴ The Qube can “swoop[] back and forth” at an altitude of 200 feet, can “captur[e] crystal-clear video,” and is “controlled remotely by a tablet computer.” *See* Hennigan, *supra* note 19.

⁴⁵ Gary Mortimer, *Boeing ScanEagle*, SUAS NEWS (Mar. 17, 2011), <http://www.suasnews.com/boeing-scaneagle/>. The ScanEagle is larger and has a wingspan of 10 feet. *Id.*

⁴⁶ *A160T Hummingbird*, BOEING.COM, http://www.boeing.com/bds/phantom_works/hummingbird/docs/hummingbird_overview.pdf (last updated Aug. 2012). The A160T Hummingbird weighs up to 6,500 pounds but does not need a runway for taking off or landing. *Id.*

⁴⁷ Bennett, *supra* note 17.

⁴⁸ *See* CBS DC, *supra* note 20.

⁴⁹ *See* Andy Greenberg, *Flying Drones Can Crack Wi-Fi Networks, Snoop on Cell Phones*, FORBES.COM (July 28, 2011, 2:11 PM), <http://www.forbes.com/sites/andygreenberg/2011/07/28/flying-drone-can-crack-wifi-networks-snoop-on-cell-phones/>.

⁵⁰ Visual surveillance includes photographs and video photography. The issues of electronic surveillance and drone weaponry will be left for another day.

drones can be used to hover over a location and continuously observe every action or movement of a specific person or vehicle, or to search for suspicious activities.⁵¹

Drones may be put to many beneficial uses other than everyday governmental surveillance. Such uses could include search and rescue operations, spotting and fighting wildfires, police chases, hostage crises, manhunts, bomb threats, SWAT team operations, industrial disaster prevention, riot control strategies, and assessment of perils during or in the immediate aftermath of nuclear accidents, tsunamis, and earthquakes. No one could rightfully claim that these emergency governmental operations violate the Fourth Amendment; indeed, they would be permissible under the emergency exception⁵² to the Fourth Amendment's warrant requirement, even if drone surveillance were found unconstitutional in other circumstances. This article, however, focuses on law enforcement drone surveillance in non-emergency situations.

The FAA Modernization and Reform Act of 2012 (Act) was signed into law on February 14, 2012, and will likely increase the use of drones in the future.⁵³ The Act requires that the FAA authorize public agencies to use unmanned aircraft systems (also known as drones) in the domestic navigable airspace.⁵⁴ On May 14, 2012, the FAA announced that an agreement had been reached with the Department of Justice's National Institute of Justice in satisfaction of this Congressional mandate.⁵⁵ The agreement allows a governmental public safety agency to operate drones under certain restrictions. Specifically,

⁵¹ See M. Ryan Calo, *The Drone as Privacy Catalyst*, 64 STAN. L. REV. ONLINE 29, 30 (2011), available at http://www.stanfordlawreview.org/sites/default/files/online/articles/64-SLRO-29_1.pdf.

⁵² See generally Edward G. Mascolo, *The Emergency Doctrine Exception to the Warrant Requirement Under the Fourth Amendment*, 22 BUFF. L. REV. 419, 426 (1972–1973). In a true emergency, the Fourth Amendment is not violated if the police fail to get a search warrant before conducting what would otherwise be a search in order to deal with the emergency. *Id.*

⁵³ FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, 126 Stat. 11.

⁵⁴ Section 334 of the Act provides that the FAA shall enter into agreements with appropriate government agencies to simplify and expedite the process of obtaining authorization to operate public unmanned aircraft systems (UAS) in the national airspace system. *Id.* The agreements shall allow a government public safety agency to operate unmanned aircraft during daylight conditions, within uncontrolled airspace where operations may be conducted under Instrument Flight Rules or Visual Flight Rules. *Id.*; see also Section 3. *Class G Airspace*, FAA.GOV (Mar. 7, 2013), www.faa.gov/air_traffic/publications/atpubs/aim/aim0303.html. This is consistent with the list of already approved law enforcement COAs. See ELEC. FRONTIER FOUND., *supra* note 21, for a partial list.

⁵⁵ Fed. Aviation Admin., *FAA Makes Progress with UAS Integration*, FAA.GOV, <http://www.faa.gov/news/updates/?newsId=68004> (last modified May 14, 2012).

when a public agency has demonstrated proficiency in flying its drones, it will receive an operational Certificate of Authorization (COA).⁵⁶ At the same time, private drone manufacturers eagerly await increased opportunities to sell their products to law enforcement based on their perception—supported by strong evidence—that the sale of drones will produce a very profitable market.⁵⁷ “The goal is to have [drones] in the trunk of a police car and to have them be able to access those unmanned systems within minutes, if need be.”⁵⁸ The inevitable proliferation of drones in the national airspace will thus require courts to reexamine how the Fourth Amendment should limit the invasion of privacy resulting from such law enforcement surveillance.

II. THE FOURTH AMENDMENT AND PROTECTION OF PRIVACY

The right of the people to be secure in their persons, houses, papers, and effects, against *unreasonable* searches and seizures, shall not be violated, and 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.⁵⁹

The Fourth Amendment does not ban all searches and seizures, only unreasonable ones.⁶⁰ There are two steps required to determine whether a search⁶¹ violates the Fourth Amendment: (1) whether the government action constitutes a “search” within the meaning of the Fourth Amendment; and (2)

⁵⁶ Proficiency would include safety-related issues that are beyond the scope of this article. Sections 332 to 336 of the Act require that the UASs have the “sense and avoid capability,” meaning the capability to remain a safe distance from, and to avoid collisions with other aircraft. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, 126 Stat. 11.

⁵⁷ See Jim Haddadin, *Drones at Home? Unmanned Aircraft Cleared for Takeoff Inside U.S.*, FOSTERS.COM (Feb. 19, 2012), http://www.fosters.com/apps/pbcs.dll/article?AID=/20120219/GJNEWS_01/702199914 (“The legislation will be a boon to the unmanned vehicle industry, which was estimated by one industry group to be worth a combined \$4.3 billion in 2011, according to [Ben] Gielow. That figure could reach \$11 billion by 2020.” (quoting Ben Gielow, Gov’t Relations Manager and General Counsel for the Ass’n for Unmanned Vehicle Systems Int’l)).

⁵⁸ *Id.*

⁵⁹ U.S. CONST. amend. IV (emphasis added).

⁶⁰ *Skinner v. Ry. Lab. Exec. Ass’n*, 489 U.S. 602, 619 (1989).

⁶¹ Most of this article focuses on searches rather than seizures. A seizure is a “meaningful interference with an individual’s possessory interests in [his] property.” *United States v. Jones*, 132 S. Ct. 945, 958 (2012) (Alito, J., concurring) (quoting *United States v. Jacobsen*, 466 U.S. 109, 113 (1984)). By its very nature, aerial surveillance by a drone is not a seizure because it does not interfere with any possessory interest of a person on the ground below. Indeed, the success of the surveillance depends on the stealth and non-interference capability of the drone.

if so, whether the search is “unreasonable” within the meaning of the Fourth Amendment.⁶²

An “essential purpose of [the Fourth Amendment] is to protect privacy interests” against the “random or arbitrary acts of [the] government,”⁶³ with the reasonableness requirement offering a safeguard and pivotal means of protecting a person’s privacy interest.⁶⁴ Simply put, “The Amendment guarantees the privacy, dignity, and security of persons against certain arbitrary and invasive acts by officers of the Government or those acting at their direction.”⁶⁵

The “reasonableness” of a search depends on the circumstances existing at the time the search is conducted.⁶⁶ The degree of privacy secured to citizens by the Fourth Amendment—as determined by what is reasonable under the circumstances—has changed over time due to both the development of technological advances⁶⁷ and changes in Fourth Amendment jurisprudence. Computers, smartphones, GPS devices, infrared detectors, night goggles, and X-ray scanners did not exist—nor were they foreseen—when the Fourth Amendment was enacted in 1791, or throughout much of the twentieth century when judicial pronouncements created many of the Amendment’s exceptions. On the one hand, these advances in technology have *increased* individuals’ privacy in many ways.⁶⁸ On the other hand, they have also increased the technological ability to intrude on individuals’ privacy. This double-edged sword poses a difficult challenge for courts in their application of the Fourth Amendment’s privacy protections.

Changes in Fourth Amendment jurisprudence over time have also affected the degree of privacy the Fourth Amendment secures. Perhaps the most significant change occurred in 1967 when the Supreme Court decided *Katz v. United States*.⁶⁹ In *Katz*, the Court considered the legality of police eavesdropping on a telephone call made from an enclosed public telephone

⁶² *Skinner*, 489 U.S. at 619-22.

⁶³ *Id.* at 621-22.

⁶⁴ *United States v. Kincade*, 379 F.3d 813, 821 (2004) (citing *Pennsylvania v. Mimms*, 434 U.S. 106, 108-09 (1977)).

⁶⁵ *Skinner*, 489 U.S. at 613-14.

⁶⁶ *See Kincade*, 379 F.3d at 822.

⁶⁷ *Id.* at 821 (quoting *Kyllo v. United States*, 533 U.S. 27, 33-34 (2001)).

⁶⁸ As a result of increases in technology, we are now able to perform many tasks from our homes that previously required us to leave our homes and be observed in public (e.g., electronic banking, emails, text messages, phone and video conferences, Skype, etc.). *See generally* *Simmons*, *supra* note 3.

⁶⁹ *Katz v. United States*, 389 U.S. 347 (1967).

booth.⁷⁰ The police listened in on Katz's conversation that was taking place inside the booth by placing a listening device on the booth's exterior. In many of the Fourth Amendment decisions before *Katz*, the Court had used physical intrusion into the defendant's property as the triggering search that could lead to a constitutional violation, suggesting that the absence of any physical intrusion into a protected area would render the eavesdropping constitutionally permissible.⁷¹ The Court, however, took a different approach in *Katz*, finding a violation despite the fact that police committed no physical trespassory act.⁷²

As promulgated in *Katz* and its progeny, the controlling test to determine if a governmental action constitutes a "search" asks whether the individual holds a reasonable expectation of privacy.⁷³ If the individual does hold such an expectation, then a warrant—or an exception to the warrant requirement—is necessary to avoid a Fourth Amendment violation.⁷⁴ On the other hand, if the individual does not have a reasonable expectation of privacy, there is no search and thus no Fourth Amendment violation.⁷⁵ Perhaps foreshadowing the difficulties that future courts would confront in classifying constitutionally protected areas, the *Katz* Court emphasized that "[w]hat a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection. But what he seeks to preserve as private, even in an area accessible to the public, may be constitutionally protected."⁷⁶ This seemingly contradictory language has taken on new significance in situations involving new technologies such as drone surveillance.

The Supreme Court has established a two-prong test⁷⁷ for determining whether an individual has a reasonable expectation of privacy: (1) whether the individual's conduct reflects "an actual expectation of privacy,"⁷⁸ and (2) whether it

⁷⁰ *Id.* at 348.

⁷¹ *Olmstead v. United States*, 277 U.S. 438, 466 (1928).

⁷² *Katz*, 389 U.S. at 353.

⁷³ *See, e.g., Kyllo v. United States*, 533 U.S. 27, 33 (2001); *California v. Ciraolo*, 476 U.S. 207 (1986).

⁷⁴ *See Katz*, 389 U.S. at 361.

⁷⁵ *See id.*

⁷⁶ *Id.* at 351-52 (citation omitted).

⁷⁷ This two-prong approach was initially suggested by Justice Harlan in his concurring opinion in *Katz*. *See id.* at 361 (Harlan, J., concurring).

⁷⁸ The Court has indicated that in some very unusual situations, the subjective expectation prong of the reasonable expectation of privacy test might

is an expectation that society is prepared to recognize as “reasonable.”⁷⁹ The first prong involves a subjective inquiry as to facts that can be fairly easily ascertained from the circumstances of the situation. The second prong, however, requires an objective analysis and has given courts a great deal of difficulty, in light of the fact that what society considers “reasonable” has changed over time.

Katz’s reasonable expectation of privacy test has been used in Fourth Amendment cases ever since, despite receiving heavy criticism throughout subsequent judicial decisions.⁸⁰ For example, Justice Powell expressed concern that Fourth Amendment rights would “gradual[ly] decay” under the reasonable-expectation-of-privacy test “as technology advances.”⁸¹ On a separate occasion, Justice Marshall suggested that the *Katz* test be replaced with a test that focuses “on the risks [the individual] should be forced to assume in a free and open society.”⁸²

provide an inadequate index of Fourth Amendment protection. For example, if the Government were suddenly to announce on nationwide television that all homes henceforth would be subject to warrantless entry, individuals thereafter might not in fact entertain any actual expectation of privacy regarding their homes, papers, and effects. Similarly, if a refugee from a totalitarian country, unaware of this Nation’s traditions, erroneously assumed that police were continuously monitoring his telephone conversations, a subjective expectation of privacy regarding the contents of his calls might be lacking as well. In such circumstances, where an individual’s subjective expectations had been “conditioned” by influences alien to well-recognized Fourth Amendment freedoms, those subjective expectations obviously could play no meaningful role in ascertaining what the scope of Fourth Amendment protection was. In determining whether a “legitimate expectation of privacy” existed in such cases, a normative inquiry would be proper.

Smith v. Maryland, 442 U.S. 735, 740-41 n.5 (1979).

⁷⁹ The first prong is a subjective test, and the second prong is an objective test. Both must be satisfied to establish a reasonable expectation of privacy. Examples of this test’s application can be found in *Minnesota v. Olson*, 495 U.S. 91 (1990) (overnight houseguest has a reasonable expectation of privacy in his temporary quarters), *United States v. Cunag*, 386 F.3d 888 (9th Cir. 2004) (no reasonable expectation of privacy in hotel room procured with forged ID documents and dead woman’s credit card), *United States v. Lyons*, 992 F.2d 1029 (10th Cir. 1993) (no reasonable expectation of privacy in contents of computer that the suspect stole), and *People v. Pleasant*, 19 Cal. Rptr. 3d 796 (2004) (people who live with probationers who remain subject to probation searches cannot reasonably expect privacy in areas of the residence that they share with the probationer).

⁸⁰ It has been criticized as being “circular, . . . subjective[,] and unpredictable.” *Kyllo v. United States*, 533 U.S. 27, 34 (2001). It has also been criticized because a trial judge is likely to substitute his or her own expectations of privacy for society’s “reasonable person’s” expectations in the second prong of the test. See *United States v. Jones*, 132 S. Ct. 945, 962 (2012) (Alito, J., concurring).

⁸¹ *Dow Chem. Co. v. United States*, 476 U.S. 227, 240 (1986) (Powell, J., dissenting).

⁸² *Smith*, 442 U.S. at 750. (Marshall, J., dissenting).

Over the years, scholars have argued that *Katz's* reasonable expectation of privacy test has outlived its usefulness and that today's rapid rate of technological change requires a new test that would address the concerns raised by Justice Powell. Although frequently well devised, many proposed tests would present equal (if not greater) difficulties in application than the *Katz* test itself. Indeed, this is inevitable because the "reasonableness" exception to the Fourth Amendment's warrant requirement mandates that any proposed alternative test include a "reasonableness" standard. For example, Professor Clancy's test asks whether an individual has a "right to exclude" the government, but it nonetheless requires the court to determine whether the police conduct was "reasonable."⁸³ Professor Nowlin, on the other hand, refocuses the question of reasonableness around the Fourth Amendment's "right to be secure" and would thereby replace a reasonable expectation of privacy with reasonable security.⁸⁴ Professor

⁸³ Thomas K. Clancy, *Coping with Technological Change: Kyllo and the Proper Analytical Structure to Measure the Scope of Fourth Amendment Rights*, 72 MISS. L.J. 525, 541 (2002).

To adequately protect and give recognition to the ability to exclude, normative values must be employed. Do the precautions taken by the person objectively evidence an intent to exclude the human senses? Does the particular surveillance technique utilized by the government defeat the individual's right to exclude? Would the "spirit motivating the framers" of the Amendment "abhor these new devices no less" than the "direct and obvious methods of oppression" that inspired the Fourth Amendment? The answer to each of these questions may be an empirical inquiry at times, but is always a value judgment.

Id. at 549-50 (quoting *Goldman v. United States*, 316 U.S. 129, 139 (1942) (Murphy, J., dissenting)). "The right to exclude is the sum and essence of the right protected." *Id.* at 541. A "search" would occur whenever "the police have learned something about the object that would otherwise have been imperceptible absent the use of the technological device." *Id.* at 560. Although this right is not absolute because it only protects against *unreasonable* searches and seizures, "the burden [would be] on the government to justify its actions" as *reasonable*. *Id.* at 564.

⁸⁴ See Jake Wade Nowlin, *The Warren Court's House Built on Sand: From Security in Persons, Houses, Papers, and Effects to Mere Reasonableness in Fourth Amendment Doctrine*, 81 MISS. L.J. 1017, 1051-52 (2012). The author's contention is that in its effort to expand the Fourth Amendment protection by introducing the reasonable expectation of privacy standard, the Warren Court actually set in motion the unintended consequence of reducing privacy in one's person, house, papers, and effects. See *id.* at 1019. This occurred because the focus shifted away from the enumerated protected interests of that clause and focused on the reasonableness of the police conduct under the circumstances. See *id.* at 1082-83. Nowlin would require that police conduct provide "reasonable security" to the protected interests enumerated in the amendment. *Id.* at 1080; see also Timothy Casey, *Electronic Surveillance and the Right to Be Secure*, 41 U.C. DAVIS L. REV. 977 (2008). Casey would "redefin[e] the [Amendment's] protection . . . as a security interest rather than a privacy interest, [thereby] dispel[ling] the false dichotomy between privacy and security." *Id.* at 1027.

Penney offers an economically informed cost-benefit analysis of the reasonable-expectation-of-privacy test that would offer no protection “when [the expectation of privacy’s] primary effect [would] impede the optimal deterrence of crime.”⁸⁵ Such a framework, however, would present even more difficult determinations as to what constitutes the “primary” effect of such an expectation or the “optimal” level of deterrence of crime. Professor Slobogin’s two-part proportionality and exigency framework appears to eliminate any warrant exception other than exigency.⁸⁶

Professors Kerr and Ohm have proposed Equilibrium-Adjustment theories that aim to maintain the balance between police power and civil liberties.⁸⁷ Under Professor Kerr’s approach, the Supreme Court would adjust the scope of protection in response to new facts in order to maintain the status quo level of protection.⁸⁸ But a difficulty with this test lies in the fact that the Supreme Court usually takes at least five to ten years after a technological development emerges before it ultimately considers any Fourth Amendment issue on that particular innovation.⁸⁹ Professor Ohm would determine

⁸⁵ Steven Penney, *Reasonable Expectations of Privacy and Novel Search Technologies: An Economic Approach*, 97 J. CRIM. L. & CRIMINOLOGY 477, 480 (2007). As Professor Penney explains, if privacy is

used chiefly to conceal socially harmful conduct (such as crime), then legal protection for privacy in that realm should be weak and police should be given broad search powers. If, on the other hand, privacy encourages efficient behaviors, then legal protections should be strong and police powers should be limited.

Id. at 491. In essence, Professor Penney proposes a balancing test, weighing the costs and benefits of limiting the government’s ability to obtain information about criminal activities. *Id.* at 491-92.

⁸⁶ See Christopher Slobogin, *Government Dragnets*, 73 L. & CONTEMP. PROBS. 107, 109 (2010). Professor Slobogin proposes that the justification for the search must be proportional to its intrusiveness. *Id.* at 139. The analysis should focus on “hit rates” and the likelihood of success, not the importance of the governmental interest. *Id.* If no exigency exists, the police should obtain judicial authorization. *Id.* at 141. But, Professor Slobogin also exempts most suspicionless group searches and would defer to a legislative approach on those. *Id.*

⁸⁷ Orin S. Kerr, *An Equilibrium-Adjustment Theory of the Fourth Amendment*, 125 HARV. L. REV. 476, 482 (2011) (“When changing technology or social practice expands police power, threatening civil liberties, courts can tighten Fourth Amendment rules to restore the status quo. The converse is true, as well. When changing technology or social practice restricts police power, threatening public safety, courts can loosen Fourth Amendment rules to achieve the same goal.”); Paul Ohm, *The Fourth Amendment in a World Without Privacy*, 81 MISS. L.J. 1309 (2012).

⁸⁸ Kerr, *supra* note 87, at 487.

⁸⁹ For example, the *Jones* case on GPS surveillance was decided in 2012, more than twelve years after GPS technology had been made commonly available to the public. On May 1, 2000, President Clinton “ordered the U.S. military to stop

the proper balance by using metrics to determine that “it should take, on average, just as long to solve a crime today as it has *in the past*.”⁹⁰ A few issues, however, could pose difficulties in applying the Ohm test. First, how would courts decide what starting date to use as a basis for the “past”? Second, the test might also overlook the fact that police techniques have changed significantly over the years and police investigations have become much more efficient. Third, it would seem almost impossible to measure the average length of investigations in the past, even if that data were available.

Underlying each of these proposed tests and the current reasonable-expectation-of-privacy test itself is the same fundamental question of where to draw the balance between law enforcement power and civil liberties⁹¹: How should the Court determine what society is willing to accept as “reasonable” or what constitutes “reasonable security”? Reasonableness should vary as a function of society’s evolving practices and mores and national events. But should this be determined by taking a poll of society?⁹² Such an approach would create

scrambling signals from its [GPS] satellite network, thus making the data available to civilian GPS owners. This action allowed boaters, motorists, and hikers using GPS receivers to enjoy the far more precise positioning data previously available only to the military.” Robert Longley, *Civilians Can Use Military GPS Data*, ABOUT.COM (May 3, 2000), <http://usgovinfo.about.com/library/news/aa050300b.htm>.

⁹⁰ Ohm, *supra* note 87, at 1345-46 (emphasis added). The author discusses the different scholarly suggestions in a world where privacy is disappearing and finds them inadequate, including Kerr’s Equilibrium-Adjustment theory. *Id.* at 1310-13. Professor Ohm proposes a different kind of Equilibrium-Adjustment theory where the balance of power between the police and the citizens is adjusted by the courts as needed based on the metrics, either by shifting the balance back to the citizen by introducing other requirements such as necessity, or back to the police such as is found in the Electronic Communication Privacy Act (ECPA). He also proposes making the default rule in favor of the citizen. *Id.* at 1348-49, 1351-52.

⁹¹ Professor Lee would shift the balance more in favor of the citizen. *See generally* Cynthia Lee, *Reasonableness with Teeth: The Future of Fourth Amendment Reasonableness Analysis*, 81 MISS. L.J. 1133 (2012). Lee proposes replacing the reasonableness standard that defers too much to governmental interest with a more rigorous non-deferential standard of review. *See id.* She proposes a hybrid model involving rebuttable presumptions and four factors if the warrantless search did not fall within an established exception: (1) a presumption of unreasonableness would apply if the search was highly intrusive; (2) a presumption of unreasonableness would arise if the search was not supported by probable cause; (3) there would be a presumption of unreasonableness if there was little or no danger to the officer, the public, or the investigation; (4) the good faith or bad faith of the officer would also be considered; (5) if an established exception applied, at least two of these factors would be required to rebut the presumption of reasonableness. *Id.* at 1171-75.

⁹² Consider, for example, the “anger” of smart phone subscribers and car owners when it was suggested that the GPS in those devices could be used for covert tracking of their movements. *See United States v. Jones*, 132 S. Ct. 945, 956 n.* (2012) (Sotomayor, J., concurring). A February 13, 2012 Rasmussen poll reported that 52% of voters are opposed to domestic police drone surveillance. “Only 30% favor the use of

enormous difficulties.⁹³ Nor can these societal practices and mores be decided by nine Justices—or by whichever trial judges happen to be presented with the issue in the first instance⁹⁴—based on their personal views or drawn only from their life experiences.⁹⁵ As Justice Alito suggested in *Jones*, Congressional action may be the closest practical way of determining the pulse of the nation, given that legislators are elected to represent the will of the people.⁹⁶ But then again, the Court would be abdicating its role in interpreting and upholding the supremacy of the Constitution if legislation were used as the *sole* measuring tool for Fourth Amendment protection.

The discussion above shows why *Katz*'s reasonable expectation of privacy test has survived and continues to endure today, despite the existence of heavy criticism and many proposed alternatives.⁹⁷ The question thus becomes: How

unmanned drones for domestic surveillance. Seventeen percent (17%) are undecided.” *Voters Are Gung-Ho for Use of Drones but not Over the United States*, RASMUSSEN REPS. (Feb. 13, 2012), http://www.rasmussenreports.com/public_content/politics/current_events/afghanistan/voters_are_gung_ho_for_use_of_drones_but_not_over_the_united_states. A Monmouth University poll released June 12, 2012, showed that

[a]n overwhelming majority of Americans support the idea of using drones to help with search and rescue missions (80%). Two-thirds of the public also support using drones to track down runaway criminals (67%) and control illegal immigration on the nation's border (64%). One area where Americans say that drones should *not* be used, though, is to issue speeding tickets. Only 23% support using drones for this routine police activity while a large majority (67%) oppose[s] the idea. . . . Specifically, 42% of Americans would be very concerned and 22% would be somewhat concerned about their own privacy if U.S. law enforcement started using unmanned drones with high tech surveillance cameras. Another 16% would be just a little concerned and 15% would not be concerned at all.

Press Release, Monmouth Univ. Poll, U.S. Supports Some Domestic Drone Use: But Public Registers Concern About Own Privacy (June 12, 2012), *available at* <https://www.monmouth.edu/assets/0/84/159/2147483694/3b904214-b247-4c28-a5a7-cf3ee1f0261c.pdf>.

⁹³ What if the public was almost evenly divided on the issue? Would a simple majority dictate what is “reasonable”? How often should the poll be taken? Should another poll be taken when a major national event, such as the 9/11 attacks on the World Trade Center and the Pentagon, occurs? In addition, should the poll questions distinguish between the different types of investigations (e.g., surveillance of domestic terrorists versus drug cases)?

⁹⁴ *See Jones*, 132 S. Ct. at 962 (Alito, J., concurring).

⁹⁵ *See id.* at 962 (Alito, J., concurring). Justice Scalia has sarcastically pointed out that the expectations of privacy “that society is prepared to recognize as reasonable bear an uncanny resemblance to those expectations of privacy that this Court considers reasonable.” *Minnesota v. Carter*, 525 U.S. 83, 97 (1998) (citations omitted) (internal quotation marks omitted).

⁹⁶ *See id.* at 962-63 (Alito, J., concurring).

⁹⁷ *See id.* at 953-54.

long can the test survive in our rapidly evolving technological world of drones? That issue is addressed below in Part V.

III. AN OVERVIEW OF CURRENT AERIAL SURVEILLANCE JURISPRUDENCE

The Supreme Court did not overrule prior aerial surveillance cases in *Jones*.⁹⁸ Thus, the existing aerial surveillance jurisprudence must be reviewed in order to foretell if and to what extent the Court may uphold the constitutionality of drone surveillance of our neighborhoods given the conflicting opinions in *Jones*.

The leading case on aerial surveillance by the government is *California v. Ciraolo*, a 1986 case in which the Court applied *Katz*'s two-prong reasonable-expectation-of-privacy test and held, five to four, that a warrantless, naked-eye police observation of the backyard of a house did not constitute a "search" under the Fourth Amendment where it was conducted from a fixed-wing aircraft at 1000 feet above ground.⁹⁹ The Court accepted the fact that the backyard was within the curtilage of the house and that the defendant had exhibited a subjective expectation of privacy by erecting a fence that completely shielded the yard from observation from the street.¹⁰⁰ Nevertheless, the Court held that the defendant's expectations were not "reasonable" under the *Katz*'s second prong; they were not expectations "that society [was] prepared to honor"¹⁰¹ because private and commercial flights in the navigable airspace¹⁰² were routine.¹⁰³ The *Ciraolo* majority deemed it irrelevant that the flight and observations were not part of a routine police flight but were instead acts specifically focused on the defendant's property.¹⁰⁴ In addition, the Court analogized the publicly navigable airspace to public thoroughfares¹⁰⁵ and indicated that if no physical intrusion occurs, even the home

⁹⁸ See *infra* Part IV.

⁹⁹ *California v. Ciraolo*, 476 U.S. 207, 214 (1986).

¹⁰⁰ *Id.* at 211-12.

¹⁰¹ *Id.* at 213-14.

¹⁰² One thousand feet falls within the navigable airspace as defined by the FAA. *Id.* at 213 (citing 49 U.S.C. App. § 1304).

¹⁰³ *Id.* at 215.

¹⁰⁴ *Id.* at 214 n.2.

¹⁰⁵ *Id.* at 213 ("What a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection." (quoting *Katz v. United States*, 389 U.S. 347, 351 (1967)) (internal quotation marks omitted)).

and its curtilage are not necessarily protected from inspection.¹⁰⁶

On the same day it decided *Ciraolo*, the Court decided another aerial surveillance case in *Dow Chemical Co. v. United States*.¹⁰⁷ In *Dow*, the Environmental Protection Agency had taken photographs of open areas at Dow Chemical's 2000-acre manufacturing facility using a standard precision aerial mapping camera.¹⁰⁸ The Court, (with the same exact 5-4 split as in *Ciraolo*) held that "the taking of aerial photographs of an industrial plant complex from navigable airspace is not a search prohibited by the Fourth Amendment."¹⁰⁹ It found that Dow had exhibited a subjective expectation of privacy by implementing multiple security measures aimed at preventing visual observation of its complex from the outside.¹¹⁰ However, in applying the *Katz*'s second prong, the majority concluded that the open areas of the industrial complex were not analogous to a house's "curtilage"¹¹¹ but instead more closely resembled an "open field."¹¹² Thus, the majority determined that they were open to observation by persons in aircraft lawfully present in navigable public airspace.¹¹³

The majority emphasized that the camera used was not a "unique sensory device that, for example, could penetrate the walls of buildings and record conversations in [the buildings' interiors], but rather a conventional, albeit precise, commercial camera commonly used in mapmaking."¹¹⁴ The majority also suggested that its holding would not open the floodgates for all photography, indicating that the Fourth Amendment may nevertheless limit the technological sophistication of the cameras involved. As the Court explained, "[i]t may well be, as the Government concedes, that surveillance of private property by using highly sophisticated surveillance equipment *not*

¹⁰⁶ *See id.*

¹⁰⁷ *Dow Chem. Co. v. United States*, 476 U.S. 227 (1986).

¹⁰⁸ *Id.* at 229.

¹⁰⁹ *Id.*

¹¹⁰ *Id.* at 237 ("Dow's inner manufacturing areas are elaborately secured to ensure they are not open or exposed to the public from the ground.").

¹¹¹ *Id.* at 239. The Court's efforts in distinguishing this area from the curtilage seems unnecessary because on the same day, the Court allowed aerial surveillance of the curtilage in *Ciraolo*. *See Ciraolo*, 476 U.S. at 213, 215.

¹¹² *Dow Chem. Co.*, 476 U.S. at 239. The "open fields" doctrine was reaffirmed in *Oliver v. United States*, 466 U.S. 170 (1984). The "open fields" common law doctrine allows law enforcement to enter and search a "field" without a warrant. *See discussion infra* Part IV.

¹¹³ *Dow Chem. Co.*, 476 U.S. at 239.

¹¹⁴ *Id.* at 238.

generally available to the public, such as satellite technology, might be constitutionally proscribed absent a warrant.”¹¹⁵

Three years later, in *Florida v. Riley*,¹¹⁶ the Court was faced with a set of facts similar to those in *Ciraolo*. The case differed, however, in that the observing officer flew in a helicopter at an altitude of 400 feet rather than in a fixed-wing plane at an altitude of 1000 feet, as in *Ciraolo*. A divided Court agreed, five to four,¹¹⁷ that an officer’s warrantless observation, with his naked eye, of the interior of a partially covered greenhouse in a residential backyard¹¹⁸ did not constitute a “search” under the Fourth Amendment¹¹⁹ where it was conducted from a helicopter circling 400 feet above.

Once again, the Court accepted the fact that the defendant had exhibited a subjective expectation of privacy by planting trees and shrubs and positioning his mobile home so as to shield the greenhouse from observation from the surrounding property.¹²⁰ In applying *Katz*’s reasonable expectation of privacy test, five Justices found that the defendant could not reasonably have expected that the uncovered sides and roof of the greenhouse were protected from public inspection because planes and helicopters engaged in routine private and commercial flights could have made the same observations.¹²¹

All nine Justices agreed that the second prong of *Katz* was the controlling issue and that the decision turned on the regularity of public travel in that airspace and at that altitude.¹²² On that point, five Justices placed the burden of

¹¹⁵ *Id.* (emphasis added). We see here a similar qualification to the “not in general public use” standard that the Court majority would later assert in the *Kyllo* case, which involved an infrared sensing device. *Kyllo v. United States*, 533 U.S. 27, 34, 40 (2001); see also *infra* notes 302-308 and accompanying text.

¹¹⁶ 488 U.S. 445 (1989).

¹¹⁷ The decision was 5-4 on the *Katz* second prong. Justice O’Connor, concurring, joined the other four Justices in the majority in holding that society was not prepared to recognize the defendant’s expectations as reasonable. *Id.* at 453-55 (O’Connor, J. concurring). Justice O’Connor indicated that the pivotal issue on the second prong of the test turned on the routine nature of public flights at the altitude in question rather than on whether the helicopter was allowed by the FAA to legally operate at that altitude. *Id.* at 454.

¹¹⁸ The defendant “lived in a mobile home located on five acres of rural property. [The] greenhouse was located ten to twenty feet behind the mobile home.” *Id.* at 448.

¹¹⁹ *Id.* at 451-52.

¹²⁰ *Id.* at 450.

¹²¹ *Id.* at 451. Five Justices agreed on imposing the burden of proof on this issue on the defendant. *Id.* at 455 (O’Connor, J., concurring).

¹²² In other words, the Court considered the frequency and altitude of flyovers by non-police helicopters. *Id.* at 451 (majority opinion), 454 (O’Connor, J., concurring), 456-58 (Brennan, J., dissenting).

proof on the defendant and found no constitutional violation because the defendant failed to demonstrate that public flight over the property at the altitude in question rarely occurred.¹²³ The four dissenting Justices, however, would have placed the burden of proof on the state.¹²⁴ Meanwhile, four Justices in the plurality emphasized the fact that the FAA permitted helicopters to fly legally at an altitude of 400 feet and treated this as a significant factor.¹²⁵ Five Justices nonetheless disagreed on that point.¹²⁶

The *Riley* case provides a prime example of the continuing difficulties in applying *Katz*'s reasonable expectation of privacy test. Notably, the Court's composition changed between the decisions in *Ciraolo* and *Riley*.¹²⁷ It changed again between the time of the *Riley* decision and the *Jones* decision. Indeed, Justices Scalia and Kennedy—both members of the *Riley* majority—are the only Justices from the *Riley* Court who remain on the Court today, and both were members of the *Jones* majority, as well.¹²⁸ This suggests that at least these two Justices would be willing to uphold drone surveillance even of the curtilage under certain conditions, a proposition which is discussed more fully below.

IV. *UNITED STATES V. JONES*

In *United States v. Jones*,¹²⁹ government agents had placed a Global-Positioning-System (GPS) tracking device on a car registered to the defendant's wife,¹³⁰ placing it "on the undercarriage of the [car] while it was parked in a public parking lot."¹³¹ The agents then remotely monitored the car's

¹²³ *Id.* at 451 (majority opinion); *id.* at 455 (O'Connor, J., concurring).

¹²⁴ *Id.* at 465 (Brennan, J., dissenting), 468 (Blackmun, J., dissenting).

¹²⁵ *Id.* at 451 (majority opinion).

¹²⁶ *Id.* at 452 (O'Connor, J., concurring); *id.* at 457 (Brennan, J., dissenting); *id.* at 467 (Blackmun, J., dissenting).

¹²⁷ *Ciraolo* was decided 5-4 with Justices Burger, Rehnquist, White, Stevens, and O'Connor in the majority, and Justices Powell, Marshall, Brennan, and Blackmun dissenting. See *California v. Ciraolo*, 476 U.S. 207, 208 (1986). On the other hand, *Riley* was decided by the plurality of Justices White, Rehnquist, Scalia, Kennedy, and O'Connor, with Brennan, Marshall, Stevens, and Blackmun dissenting. *Riley*, 488 U.S. at 447, 452 (O'Connor, J., concurring).

¹²⁸ See *United States v. Jones*, 132 S. Ct. 945 (2012).

¹²⁹ *Id.*

¹³⁰ There was no dispute as to whether the defendant had standing to raise the Fourth Amendment issue with respect to his wife's car because the defendant was the "exclusive driver" of the car. *Id.* at 949 n.2.

¹³¹ *Id.* at 948.

location continuously for twenty-eight days.¹³² Following the investigation and arrest, the defendants were indicted on cocaine trafficking conspiracy charges.¹³³ The trial court suppressed the GPS information obtained from the car while it was parked inside the garage adjoining defendant's residence but permitted all other data, finding that defendant had "no reasonable expectation of privacy" in the car when it was located on public streets.¹³⁴ The defendant was eventually convicted and sentenced to life in prison.¹³⁵ The appellate court reversed, finding that the admission of the GPS location information violated the Fourth Amendment.¹³⁶ The Supreme Court granted certiorari on the issue of "whether the attachment of a [GPS] tracking device to an individual's vehicle, and subsequent use of that device to monitor the vehicle's movements on public streets, constitutes a search or seizure within the meaning of the Fourth Amendment."¹³⁷ On January 23, 2012, the Court unanimously held that the admission of this evidence violated the Fourth Amendment.¹³⁸ However, the Justices could not agree on the reasoning for upholding the judgment,¹³⁹ producing three separate opinions.¹⁴⁰

Five Justices joined in the majority opinion written by Justice Scalia.¹⁴¹ The majority held that attaching the GPS to the car and using it to monitor the car's movements constituted a search that violated the Fourth Amendment.¹⁴² For that reason, Justice Scalia's opinion found it unnecessary to decide whether the subsequent long-term monitoring also violated the constitution.¹⁴³ In an opinion written by Justice Alito, which concurred only in the judgment, the other four Justices¹⁴⁴ found

¹³² *Id.* at 948. The agents had obtained a search warrant allowing them to install the GPS device within ten days in the District of Columbia. *Id.* The GPS was placed on the 11th day (after the warrant period had expired) and the installation took place in Maryland, not in the District of Columbia. *Id.* Accordingly, the government conceded non-compliance with the warrant, and the case was decided as if there had been no warrant. *Id.* at 948 n.1.

¹³³ *Id.* at 948.

¹³⁴ *Id.*

¹³⁵ *Id.* at 948-49.

¹³⁶ *Id.* at 949.

¹³⁷ *Id.* at 948.

¹³⁸ *Id.* at 945.

¹³⁹ *Id.* at 948.

¹⁴⁰ *Id.*

¹⁴¹ The Justices were Roberts, Kennedy, Thomas, Sotomayor, and Scalia. *Id.* at 947.

¹⁴² See generally *id.*

¹⁴³ *Id.* at 954.

¹⁴⁴ The Justices were Ginsburg, Breyer, Kagan, and Alito. *Id.* at 957 (Alito, J., concurring).

that the placement of the GPS device did not constitute a search but that the subsequent long-term monitoring itself violated the Fourth Amendment.¹⁴⁵ Justice Sotomayor filed a separate concurring opinion, agreeing with both the majority and part of Justice Alito's concurring opinion.¹⁴⁶ Justice Sotomayor provided the fifth vote for the Court's holding that the attachment of the GPS was a search,¹⁴⁷ but she also agreed with the other four concurring Justices that the long-term monitoring was unreasonable.¹⁴⁸ Between all of these concurrences, five Justices held that around-the-clock surveillance for 28 days was unconstitutional, and five Justices held that the placement of the GPS itself represented an unconstitutional search.

In order to fully assess the constitutionality of drone surveillance, we must then analyze what impact the conflicting *Jones* opinions might have on the issue. The majority found that the placement of the GPS device constituted a trespass on the defendant's personal property and therefore violated the Fourth Amendment.¹⁴⁹ That portion of the opinion will not provide much insight in the analysis of drone surveillance, which will most likely occur from an aerial position without any trespass to property.¹⁵⁰ On the other hand, the concurrences of the other five Justices provide far more insight as to how the Court would treat such an occurrence. Together, those five Justices should provide a majority when applying the reasonable-expectation-of-privacy test in drone surveillance cases. This part analyzes the dicta contained in the various opinions with the aim of shedding light on the Court's most likely path in deciding future drone cases.

A. *The Majority Opinion*

In the majority opinion, Justice Scalia made it clear that the Court was not abandoning the reasonable expectation of

¹⁴⁵ *Id.* at 964.

¹⁴⁶ *Id.* at 954-55.

¹⁴⁷ *Id.* at 954.

¹⁴⁸ *Id.* at 955.

¹⁴⁹ *Id.* at 949.

¹⁵⁰ *But see* discussion *supra* Part I, concerning the capability of very small drones, such as the Nano Hummingbird, that can fly in and out of open windows or doorways. Nevertheless, we do know that two of the Justices in the majority, Justices Scalia and Kennedy, had previously upheld aerial surveillance by a plane of the curtilage in the *Riley* case. *See* discussion *supra* Part III. Because Justices Scalia and Kennedy decided *Jones* on a trespass theory, we need to look back to their rationale in *Riley* in order to predict how they would rule when faced with a non-trespassory drone surveillance (of the curtilage and other areas) in the future.

privacy test. He pointed out that *Katz*'s reasonable expectation of privacy test had not repudiated the common-law trespass test that existed before *Katz* and that both tests continued to exist concurrently in testing for Fourth Amendment violations.¹⁵¹ "*Katz*, the Court explained [in *Soldal v. Cook County*], established that the 'property rights are not the sole measure of Fourth Amendment violations' but did not 'snuff[f] out the previously recognized protection for property.'"¹⁵² The majority indicated that it did not need to decide whether the defendant had a reasonable expectation of privacy because the trespass¹⁵³ upon the defendant's personal property alone violated the Fourth Amendment. The majority referred to the *Knotts*¹⁵⁴ and *Karo*,¹⁵⁵ cases in which the Court had allowed location monitoring of a police beeper attached to a container in a car. The majority distinguished the holdings of those decisions by pointing out that the police in those two cases had planted the beeper before the defendant obtained a possessory interest in the property. As a result, no initial trespass on the defendant's property had occurred.¹⁵⁶

The *Jones* majority emphasized the importance that originalism must play in interpreting the Fourth Amendment. Indeed, the majority explained that the Fourth Amendment "must provide *at a minimum* the degree of protection it afforded when it was adopted."¹⁵⁷ When no trespass occurs—such as in a case involving "merely the transmission of electronic signals"—*Katz*'s reasonable expectation of privacy test

¹⁵¹ *Katz v. United States*, 389 U.S. 353 (1967).

¹⁵² *United States v. Jones*, 132 S. Ct. 945, 951 (2012) (second alteration in original) (quoting *Soldal v. Cook Cnty.*, 506 U.S. 56, 64 (1992)).

¹⁵³ The majority conceded that "a trespass on 'houses' or 'effects,' or a *Katz* invasion of privacy, is not alone a search unless it is done to obtain information; and the obtaining of information is not alone a search unless it is achieved by such a trespass or invasion of privacy." *Id.* at 951 n.5.

¹⁵⁴ In *United States v. Knotts*, 460 U.S. 275 (1983), the police monitored the location of the defendant's car by tracking a beeper in a container in the car while the car travelled on public roads for a few hours. *Id.* at 277-79. (Although the record is not specific on this issue, the distance between the locations described is approximately 200 miles).

¹⁵⁵ Similar to the circumstances in *Knotts*, in *United States v. Karo*, 468 U.S. 705 (1984), the police tracked a beeper in a can of ether in the defendant's car off and on for multiple days as the car moved from place to place on public roads. *Id.* at 706-10. The *Karo* opinion did not specifically define the length of each surveillance, but the beeper was tracked on at least six separate days over five months. The longest distance travelled was approximately 140 miles. The Court only allowed the beeper information into evidence when the car was on public roads but disallowed any information that was obtained when the beeper was inside any house or building. *Id.* at 714-15.

¹⁵⁶ *Jones*, 132 S. Ct. at 952.

¹⁵⁷ *Id.* at 953.

applies.¹⁵⁸ The majority also reiterated that “a person traveling . . . on public [roads] has no reasonable expectation of privacy in his movements” and that visual surveillance by a large team of officers, multiple vehicles, and aerial assistance does not violate the Fourth Amendment.¹⁵⁹ The Court found it unnecessary, however, to decide the constitutionality of “achieving the same result through electronic means, without an accompanying trespass[,]” leaving that question for another day.¹⁶⁰

What insight does the majority opinion provide with respect to drone surveillance? Four Justices refused to join the other five Justices in finding that around-the-clock surveillance for twenty-eight days necessarily violated the subject’s reasonable expectation of privacy.¹⁶¹ As such, one can infer that those four Justices *could* find such surveillance constitutionally permissible in a similar drug case,¹⁶² even where no physical trespass to property had occurred. The other five Justices would nonetheless prevail on this issue.

B. *Justice Alito’s Concurring Opinion*¹⁶³

Although Justice Alito concurred in the judgment, he strongly disagreed about the continued existence of the trespass-based rule.¹⁶⁴ He pointed out that after the trespass approach had been “repeatedly criticized,”¹⁶⁵ *Katz* “finally did away with [it]”¹⁶⁶ Indeed, twenty-three years after *Katz*, the *Karo* Court had made it clear that “an actual trespass is neither necessary *nor sufficient* to establish a constitutional violation.”¹⁶⁷

Justice Alito insisted that, despite its difficulties, *Katz*’s reasonable-expectation-of-privacy test remained the proper test to use.¹⁶⁸ He acknowledged that “[i]t involves a degree of

¹⁵⁸ *Id.*

¹⁵⁹ *Id.* at 953-54.

¹⁶⁰ *Id.* at 954.

¹⁶¹ Although Justice Sotomayor joined the majority’s trespass theory, she also agreed with Justice Alito’s concurring opinion that the 24/7 twenty-eight-day monitoring violated the Fourth Amendment. *See supra* Part IV.C.

¹⁶² This was contrary to the other five Justices who found this case not to involve an “extraordinary offense” where it would allow such surveillance. *See infra* notes 177-178 and accompanying text (discussing Justice Alito’s concurring opinion) and notes 227-230.

¹⁶³ Joined by Justices Ginsburg, Breyer, and Kagan. *Jones*, 132 S. Ct. at 957.

¹⁶⁴ *Id.* at 957-58 (Alito, J., concurring).

¹⁶⁵ *Id.* at 959.

¹⁶⁶ *Id.*

¹⁶⁷ *Id.* at 960 (quoting *United States v. Karo*, 468 U.S. 705, 713 (1984)) (internal quotation marks omitted).

¹⁶⁸ *Id.* at 958, 962.

circularity” and that “judges are apt to confuse their own expectations of privacy with those of the hypothetical reasonable person”¹⁶⁹ Society, he explained, may “eventually reconcile” with “the diminution of privacy that new technology entails,” accepting the “convenience or security at the expense of privacy.”¹⁷⁰ He suggested that the enactment of legislation might be the “best solution to privacy concerns” in the rapidly evolving technological era.¹⁷¹

However, because Congress had not acted to regulate this matter, Justice Alito conceded that “[t]he best that we can do in this case is to apply [the *Katz* test] and ask, whether the use of the GPS tracking in a particular case involved a degree of intrusion that a reasonable person would not have anticipated.”¹⁷²

Under this approach, the four concurring Justices stated that a “relatively *short-term* monitoring of a person’s movements on public streets” would be reasonable (citing *Knotts* as an example);¹⁷³ on the other hand, “*longer term* GPS monitoring in investigations of *most offenses*” would be unreasonable.¹⁷⁴ “For such offenses, society’s expectation [is] that” the police cannot “secretly monitor and catalogue every single movement of an individual’s car for a *very long period*.”¹⁷⁵ Finally, the four Justices stated that around-the-clock monitoring for four weeks would constitute an unreasonable search in violation of the Fourth Amendment.¹⁷⁶

Justice Alito did not define what a “very long period” or “longer term” meant, indicating simply that “[o]ther cases may present more difficult questions.”¹⁷⁷ Likewise, he did not define what he meant by “most offenses” but suggested that, with respect to “extraordinary offenses,” prolonged GPS monitoring may be reasonable because, in those cases, “long-term tracking might have been mounted using previously available techniques.”¹⁷⁸ Nor did he define the demarcation line for what

¹⁶⁹ *Id.* at 962.

¹⁷⁰ *Id.*

¹⁷¹ *See id.* at 964.

¹⁷² *Id.* It does not appear that Justice Alito was changing the *Katz* second prong by substituting “the reasonable person’s anticipation” for “what society is prepared to accept as reasonable.” The terms would seem to be interchangeable as an expression of “society’s expectations”; the latter is a term that Justice Alito also used in the same context.

¹⁷³ *Id.* (emphasis added).

¹⁷⁴ *See id.* (emphasis added).

¹⁷⁵ *See id.* (emphasis added).

¹⁷⁶ *See id.*

¹⁷⁷ *Id.*

¹⁷⁸ *Id.* at 954, 964.

constitutes “prolonged” monitoring or what qualifies as an “extraordinary offense.”¹⁷⁹

However, Justices Alito and Sotomayor’s concurrences sufficiently indicate that the Court would permit short-term—but not most long-term—surveillance and, along with the Justices who joined their opinions, would likely form a majority in drone cases under similar contexts. Part V discusses this issue further.

C. Justice Sotomayor’s Concurring Opinion

Justice Sotomayor, in her concurring opinion, joined the majority’s originalist approach, finding that the trespass test was an “irreducible constitutional minimum” of the Fourth Amendment.¹⁸⁰ She also agreed that, in situations without a trespass, *Katz*’s reasonable-expectation-of-privacy test would apply.¹⁸¹ On the other hand, she “agree[d] with Justice Alito[’s concurring opinion] that, at the very least, longer term GPS monitoring in investigations of most offenses impinges on expectations of privacy.”¹⁸²

With regard to short-term GPS monitoring in cases that do not involve trespasses, Justice Sotomayor went further than Justice Alito. She expressed concerns that such monitoring may “chill[] associational and expressive freedoms,”¹⁸³ and that the government’s “unrestrained power” to collect private information on individuals is “susceptible to abuse.”¹⁸⁴

GPS monitoring generates a precise, comprehensive record of a person’s public movements that reflects a wealth of detail about her familial, political, professional, religious, and sexual associations. (“Disclosed in [GPS] data . . . will be . . . trips to the psychiatrist, the plastic surgeon, the abortion clinic, the AIDS treatment center, the strip club, the criminal defense attorney, the by-the-hour motel, the union meeting, the mosque, synagogue or church, the gay bar and on and on.”).¹⁸⁵

Justice Sotomayor added that she would consider these factors when deciding the “reasonable societal expectation of

¹⁷⁹ See *id.* at 954.

¹⁸⁰ *Id.* at 955 (Sotomayor, J., concurring).

¹⁸¹ *Id.*

¹⁸² *Id.* (internal quotation marks omitted).

¹⁸³ See *id.* at 956.

¹⁸⁴ *Id.*

¹⁸⁵ *Id.* at 955 (quoting *People v. Weaver*, 12 N.Y.3d 433, 441-42 (2009) (first alteration in original)).

privacy in the sum of one's public movements" in short-term GPS monitoring.¹⁸⁶ The fact that all this information could have been gathered by means of "lawful conventional surveillance" would not be dispositive of this issue.¹⁸⁷ Moreover, she expressed strong concern about entrusting law enforcement, in the absence of judicial oversight, with "a tool so amenable to misuse, especially in light of the Fourth Amendment's goal to curb arbitrary exercises of police power and to prevent 'a too permeating police surveillance.'"¹⁸⁸ GPS monitoring could collect such a "substantial quantum of intimate information about any person who the Government, in its unfettered discretion, chooses to track" that such monitoring "may 'alter the relationship between citizen and government in a way that is inimical to democratic society.'"¹⁸⁹

In addition to these passionate concerns, Justice Sotomayor suggested two important developments in her future analyses of Fourth Amendment issues. First, she criticized the long-standing concept of third-party disclosure:

More fundamentally, it may be necessary to reconsider the premise that an individual has no reasonable expectation of privacy in information voluntarily disclosed to third parties. This approach may be ill suited to the digital age, in which people reveal a great deal of information about themselves to third parties in the course of carrying out mundane tasks.¹⁹⁰

Second, Justice Sotomayor stated that secrecy should no longer serve as a prerequisite for privacy.¹⁹¹ Information "disclosed to some member of the public for a limited purpose" may be constitutionally protected.¹⁹² Indeed, she argued that "[p]rivacy is not a discrete commodity, possessed absolutely or not at all."¹⁹³

Justice Sotomayor's dicta support a reasonable inference that she would reject the rule that categorically precludes Fourth Amendment protection of anything exposed to the public. Similarly, Justice Sotomayor would likely hold drone surveillance unconstitutional, even if a person's activities

¹⁸⁶ *Id.* at 956.

¹⁸⁷ *Id.*

¹⁸⁸ *See id.* (quoting *United States v. Di Re*, 332 U.S. 581, 595 (1948)).

¹⁸⁹ *Id.* (quoting *United States v. Cuevas-Perez*, 640 F.3d 272, 285 (7th Cir. 2011)).

¹⁹⁰ *Id.* at 957 (citation omitted).

¹⁹¹ *Id.*

¹⁹² *See id.*

¹⁹³ *Id.* (quoting *Smith v. Maryland*, 442 U.S. 735, 749 (1979) (Marshall, J., dissenting)).

were publicly observable, if the governmental intrusion on the person's privacy is extensive.

The concurring opinions in *Jones* provide significant insight about what the Court may do in the future when faced with drone surveillance in public places. These five Justices would most likely represent the majority in drone cases. However, since the concurring Justices in *Jones* focused on the *duration* of surveillance rather than on the *nature* of the observations, a comprehensive analysis of drone surveillance issues must also consider previous surveillance jurisprudence that assessed the nature of the observations, either with the naked eye¹⁹⁴ or with photography,¹⁹⁵ given that drone surveillance will necessarily involve photography of visual observations.

V. HOW WILL THE SUPREME COURT APPLY THE FOURTH AMENDMENT WHEN POLICE USE DRONES IN OUR NEIGHBORHOODS?

A. *The Challenge of Applying Katz's Reasonable Expectation of Privacy Test to Advanced Drone Technology*

As law enforcement's use of drones becomes more routine, how will the Supreme Court strike the proper balance under the Fourth Amendment between protecting individual privacy and permitting law enforcement to engage in investigative activity? Drones will most likely operate within "navigable airspace" as the FAA is likely to define it.¹⁹⁶ And because of their design, drones will not interfere with people on the ground by creating undue noise, dust, pollution, or threat of injury.¹⁹⁷ Their use will not involve any physical intrusion on property except in the unlikely event that a drone were to physically enter the home.¹⁹⁸ Visual surveillance is not, in itself, trespassory because "the eye . . . cannot be guilty of trespass."¹⁹⁹

¹⁹⁴ See *Florida v. Riley*, 488 U.S. 445 (1989); *California v. Ciraolo*, 476 U.S. 207 (1986).

¹⁹⁵ See *Dow Chem. Co. v. United States*, 476 U.S. 227, 236 (1986).

¹⁹⁶ See *supra* note 54 and accompanying text.

¹⁹⁷ See *supra* Part I. The absence of "undue noise, . . . wind, dust, or threat of injury" was a factor considered by the majority in deciding that the aerial surveillance of the curtilage was not a "search" in *Riley*. 488 U.S. at 452.

¹⁹⁸ It is unlikely that any law enforcement agency would push the envelope by sending a drone into a home, even though doing so is technologically possible. See *supra* Part I (discussing small drones, such as the Nano Hummingbird).

¹⁹⁹ See *Kyllo v. United States*, 533 U.S. 27, 32 (2001) (quoting *Boyd v. United States*, 116 U.S. 616, 628 (1886)).

As such, the trespass theory employed by the *Jones* majority and pre-*Katz* cases will offer little assistance in applying the Fourth Amendment to drone surveillance. The Court will have no choice but to use the *Katz* reasonable expectation of privacy test or create a new test.²⁰⁰ There is no reason to create a new test, however, because, as will be discussed below, the existing reasonable expectation of privacy test can effectively control drone surveillance.

While *Katz*'s reasonable expectation of privacy test may be difficult to apply in our rapidly evolving technological society, the other proposed tests²⁰¹ also present problems in their application. Even the principle of originalism has its critics.²⁰² Indeed, originalism will not solve the problem in many cases because the drafters of the Fourth Amendment could not have foreseen the manner in which new technology simultaneously advances privacy and threatens it.²⁰³ As Justice Alito argued in *Jones*, any attempt to draw realistic analogies more than two hundred years after the enactment of the Fourth Amendment would be "unwise" and "highly artificial."²⁰⁴ How can anyone presume to know what the drafters would have intended had they faced the incredible augmentation of privacy of our computer age? How too can anyone know what they would have intended to protect upon violation of that newly augmented privacy? If originalism means that the protection of privacy should remain exactly as it was in 1791, regardless of the method used by law enforcement, then it should follow that the

²⁰⁰ It is highly unlikely that the Court would allow complete free-for-all use of drones by law enforcement, relegating the entire controlling authority to Congress. This is true despite Justice Alito's argument in *Jones* in which he suggested that Congressional action would provide the best solution in the rapidly evolving technological world. See *supra* note 171 and accompanying text. The important question becomes where the Court will draw the line under the Fourth Amendment.

²⁰¹ See *supra* Part II.

²⁰² See, e.g., Donald A. Dripps, *Responding to the Challenges of Contextual Change and Legal Dynamism in Interpreting the Fourth Amendment*, 81 MISS. L.J. 1085, 1088 (2012). The social and institutional context was completely different: the founders of the Fourth Amendment understood that the common law was dynamic and subject to change by judicial decisions or by statutes; there was no pro-active police force then; the 1791 criminal justice system was amateurish, reactive, and took little action absent judicial authorization; the 1791 search and seizure rule vanished during the nineteenth century. "[I]t is arbitrary to suppose that the founders would have clung to specific rules when a changed institutional context made those rules dysfunctional." *Id.* at 1121. Perhaps the strongest originalism argument is "an aspirational balance of advantage originalism," *id.* at 1128 (emphasis omitted); that is, an argument that "asks whether [a] search[] [or] seizure[] threaten[s] the priority of individual liberty and privacy, as against public security, that the founders aspired to." *Id.*

²⁰³ See Simmons, *supra* note 3, at 533-34.

²⁰⁴ See *United States v. Jones*, 132 S. Ct. 945, 957 (2012) (Alito, J., concurring).

privacy of a citizen in his home's curtilage, secluded from public sight, should remain as protected today as it was in 1791; any surveillance from the sky would thus result in a privacy violation. Yet, the Court has held otherwise in *Ciraolo* and *Riley*.²⁰⁵ Even Justice Scalia, the passionate advocate of originalism, joined the majority in *Riley* that held that aerial surveillance of the curtilage from an altitude of 400 feet is constitutionally permissible.²⁰⁶

At the core of the reasonable expectation of privacy test—and most of the suggested substitute tests, whether labeled “reasonableness,” “protection of security,” or “equilibrium adjustment”—the controlling issue remains how to strike the proper balance between providing governmental protection to citizens and prosecuting crime, on the one hand, and respecting individual citizens' privacy and security in their intimate activities, on the other. Ultimately, the question of balancing society's interests with those of the individual reflects a fundamental issue of the “social contract” between individuals and their government.²⁰⁷

In striking the proper balance, “[it] would be foolish to contend that the degree of privacy secured to citizens by the Fourth Amendment has been entirely unaffected by the advance of technology.”²⁰⁸ Whichever test is used must be applied in a twenty-first century context, and in so doing, it must take into consideration both the actual gain and loss of privacy that technology has caused in our “modern” society. In deciding where to strike this balance, the Court simply cannot ignore the manner in which private companies regularly expose private and intimate information to the public.²⁰⁹ “[M]any people may find the tradeoff [between technology and loss of privacy] worthwhile”²¹⁰ for purposes of security or convenience. Although the public may not welcome the “diminution of privacy that the new technology entails, they may eventually reconcile themselves to this development as inevitable.”²¹¹ Would that result alter the definition of reasonableness

²⁰⁵ See *Florida v. Riley*, 488 U.S. 445 (1989); *California v. Ciraolo*, 476 U.S. 207 (1986).

²⁰⁶ *Riley*, 488 U.S. at 452.

²⁰⁷ See JEAN-JACQUES ROUSSEAU, *THE SOCIAL CONTRACT* 59-62 (1762).

²⁰⁸ *Kyllo v. United States*, 533 U.S. 27, 33-34 (2001).

²⁰⁹ Referring to all the private information that one can find on the internet, social media, and the satellite-type of photos of neighborhoods that Apple and Google provide online.

²¹⁰ *United States v. Jones*, 132 S. Ct. 945, 962 (2012) (Alito, J., concurring).

²¹¹ *Id.*

according to the public's expectations? When large enough groups manifest acceptance of the loss of privacy technology brings, courts would have to find, under *Katz*, that it is unreasonable for "society" to expect otherwise.²¹²

For example, a loss of privacy in our homes and backyards has already resulted from Google and Apple's software applications that provide 3-D mapping of the nation's metropolitan areas.²¹³ Both companies are presently competing with each other to improve their mappings by taking multiple aerial photographs with very precise cameras.²¹⁴ Indeed, politicians have already voiced concerns about the invasion of privacy by the upcoming publication of these images of people's backyards and other private settings.²¹⁵ If such images are available to the public by merely accessing Google online, how can the Court forbid the police from using aerial surveillance to obtain similar images?²¹⁶

²¹² This is a necessary corollary to what one commentator suggested: "When a large enough group of people start to manifest subjective expectations of privacy, 'society [becomes] prepared to recognize [that expectation] as reasonable,' the expectation becomes objective, and courts adopt it." Joseph J. Vacek, *Big Brother Will Soon Be Watching—Or Will He? Constitutional, Regulatory, and Operational Issues Surrounding the Use of Unmanned Aerial Vehicles in Law Enforcement*, 85 N.D. L. REV. 673, 692 (2009) (alterations in original) (footnote omitted) (quoting *Smith v. Maryland*, 442 U.S. 735, 740 (1979)).

²¹³ Allen, *supra* note 22.

²¹⁴ See Alexei Oreskovic, *Google's, Apple's Eyes in the Sky Draw Scrutiny*, REUTERS (June 19, 2012, 6:33 PM), <http://www.reuters.com/article/2012/06/19/us-google-privacy-idUSBRE85I1QU20120619>.

²¹⁵ See Press Release, Sen. Charles E. Schumer, New Apple and Google Plans to Use Military-Grade Spy Planes to Map Communities and Publish Images Could Cause Unprecedented Invasion of Privacy (June 18, 2012), *available at* <http://www.schumer.senate.gov/Newsroom/record.cfm?id=337036>; see also Carl Franzen, *Schumer: Google, Apple Moves to 3D Maps a Dimension Too Far!*, TALKINGPOINTSMEMO.COM (June 19, 2012, 6:01 AM), <http://idealab.talkingpointsmemo.com/2012/06/sen-schumer-questions-google-and-apple-over-3d-mapping-surveys.php> (discussing remarks by U.S. Senator Charles Schumer of New York). Schumer cited reports claiming that the technology used is the equivalent of military-grade technology, capable of imaging objects as small as four inches. Schumer Press Release, *supra*; see also Franzen, *supra*; Letter from Joe Barton & Edward J. Markey, U.S. Representatives, to Michael P. Huerta, Acting Adm'r of U.S. Fed. Aviation Admin. (Apr. 19, 2012), *available at* <http://markey.house.gov/sites/markey.house.gov/files/documents/4-19-12.Letter%20FAA%20Drones%20.pdf> ("[T]here is also the potential for drone technology to enable invasive and pervasive surveillance without adequate privacy protections The surveillance power of drones is amplified when the information from onboard sensors is used in conjunction with facial recognition, behavior analysis, license plate recognition, or any other system that can identify and track individuals as they go about their daily lives."); see also Pierce, *supra* note 2.

²¹⁶ Of course, the police could just go to the Google website and use the images there instead of doing any aerial surveillance. The Google images, however, would be archived images, not real-time ones, but could still provide a basis for "reasonable suspicion" to investigate further by aerial surveillance. As one commentator envisioned, "[t]omorrow's police and journalists might sit in an office or vehicle as their metal agents methodically search for interesting behavior to record and relay." Calo, *supra* note 51, at 32.

Assuming that Congress would step in and regulate these private companies and statutorily limit what they can expose to the public, the Court would then be in a better position to strike the proper balance under the Fourth Amendment.²¹⁷

This part will examine how *Jones's* dicta could forecast how the Court will respond to the use of police drones over our neighborhoods. As indicated above, this analysis requires a review of the rest of the current Fourth Amendment jurisprudence in order to project these future developments.

Because courts have traditionally held that the degree of privacy protection varies in descending order from the home, to the curtilage, to open fields, and finally to public places,²¹⁸ this section will consider the constitutionality of aerial drone surveillance in each of these four areas.²¹⁹ Because *Jones* focused on surveillance conducted in the public, a review of drone surveillance in public places provides a logical starting point.

B. *Drone Surveillance of Public Places Subject to Constant Security Surveillance*

Jones's dicta and the previous aerial surveillance cases offer great insight into how the Court might deal with aerial surveillance of public places by drones. Should any distinction exist between the public highways considered in *Jones* and other public places? After the events of 9/11, it would be difficult to successfully argue that one has any privacy interest

²¹⁷ See, e.g., Preserving Freedom from Unwarranted Surveillance Act of 2012, S. 3287, 112th Cong. (2012), available at [http://thomas.loc.gov/cgi-bin/bdquery/z?d112:s.3287:%20\(S.%203287\)](http://thomas.loc.gov/cgi-bin/bdquery/z?d112:s.3287:%20(S.%203287)). This bill was introduced but was not passed in the 112th Congress by the time that it adjourned. It is likely that it will be reintroduced in the 113th Congress. Its terms would force federal law enforcement to obtain a warrant based on probable cause before using domestic drones. *Id.* § 3. There were some exceptions within this bill, such as the patrol of our national borders, when immediate action was necessary to prevent “imminent danger to life” and when there was a high risk of a terrorist attack. *Id.* § 4. Any evidence obtained or collected in violation of the Act would have been inadmissible in a criminal prosecution. *Id.* § 6. Any affected person could sue the government. *Id.* § 5; see also Rand Paul, Opinion, *Don't Let Drones Invade Our Privacy*, CNN.COM (June 5, 2012), <http://www.cnn.com/2012/06/14/opinion/rand-paul-drones/index.html>. The companion bill to S. 3287 is H.R. 5925, introduced by Rep. Austin Scott. Preserving Freedom from Unwarranted Surveillance Act of 2012, H.R. 5925, 112th Cong. (2012), available at [http://thomas.loc.gov/cgi-bin/bdquery/z?d112:HR05925:%20\(H.R.%205925\)](http://thomas.loc.gov/cgi-bin/bdquery/z?d112:HR05925:%20(H.R.%205925)). Both bills were referred to committees but had received no further action when the 112th Congress adjourned.

²¹⁸ Public highways are included by definition in public places. See *infra* note 268 and accompanying text.

²¹⁹ Similarly, one would need to separate visual surveillance from other advanced sense-enhanced, non-visual surveillance. This article, however, focuses only on visual surveillance.

when attending an open-air concert or a football game with forty-thousand or more people,²²⁰ where surveillance cameras are always present for security reasons. For similar reasons, the same result should follow with respect to other locations that are subject to constant monitoring by cameras, such as outdoor entertainment centers like Live-L.A., New York's Times Square, or downtown areas of some cities. If we were ever to reach the point of a "surveillance state," with cameras everywhere, the Court may have to reconsider whether that state of affairs is consistent with the principles of a "free and open society."²²¹ But we are not there yet, although the threat of a surveillance state does not seem that far away.²²²

C. *Drone Surveillance of Public Highways and Other Public Places Not Subject to Constant Security Surveillance*

In contrast to areas subject to constant surveillance by security cameras, *Jones* examined the government's ability to track a person's movements on public highways using a GPS device attached to the car, which revealed only the location of the person and not the person's activities during these movements.²²³ Because drones could similarly track a person's movements in outdoor public places, the question then becomes a matter of what limitations the Court will impose on location tracking by drones.

The five concurring Justices²²⁴ in *Jones* expressed very clearly that they would draw the line at "prolonged" or "long-term" tracking of a person for "most offenses."²²⁵ It appears that Justice Alito used these first two terms interchangeably in his concurring opinion.²²⁶ Nevertheless, he never explained how

²²⁰ E.g., modern day raves, and other huge festivals, such as the "Burning Man" festival in the Coachella Valley in California; or Woodstock for those of us who are old enough to remember; or perhaps the Super Bowl; or the Olympics where there is always (unfortunately) a potential threat of terrorism.

²²¹ See *Smith v. Maryland*, 442 U.S. 735, 750 (1979) (Marshall, J., dissenting).

²²² A good example of how modern society may be approaching that type of surveillance state is found in Britain, where subways and downtown areas are continuously surveyed by cameras. See H.D.S. Greenway, *Opinion: Conservatives Eye Big Brother*, GLOBALPOST.COM (May 26, 2010), <http://www.globalpost.com/dispatch/worldview/100524/london-surveillance-nick-clegg-biometric-identification>.

²²³ See *supra* Part IV.

²²⁴ The Justices were Alito, Ginsburg, Breyer, Kagan, and Sotomayor.

²²⁵ *United States v. Jones*, 132 S. Ct. 945, 955 (2012) (Sotomayor, J., concurring); *id.* at 964 (Alito, J. concurring).

²²⁶ *Id.* at 964 (Alito, J., concurring).

long tracking would need to last before becoming “long-term.” We only know what the *Jones* concurrences tell us—that around-the-clock surveillance for twenty-eight days is “surely” too long.²²⁷ Neither did Justice Alito define or give examples of the kind of “extraordinary offense” that would permit “prolonged” surveillance under the Fourth Amendment.²²⁸ But, he obviously indicated that some situations would not require a warrant.²²⁹ As such, we are left to wonder what constitutes an “extraordinary offense,” except that it probably occurs where long-term surveillance would have been accomplished by traditional visual surveillance with police cars and aircraft.²³⁰

Justice Alito used the “short-term” monitoring that occurred in *Knotts* as an example of permissible surveillance.²³¹ The *Knotts* Court upheld location tracking of a single trip over a period of a few hours in a single day, where the trip covered a distance of 200 miles. Just one year later, in *Karo*, the same Court upheld location monitoring involving multiple trips over multiple days (at least six) during a period of six months, where the longest trip covered a distance of 140 miles.²³² At first glance, it would seem that the same five Justices from *Jones* would continue to uphold short-term surveillances like those in *Knotts* and *Karo*. However, Justice Sotomayor, in her separate concurring opinion, forcefully suggested that she might not support certain methods of short-term surveillance:

In cases involving even short-term monitoring, some unique attributes of GPS surveillance relevant to the *Katz* analysis will require particular attention. GPS monitoring generates a precise, comprehensive record of a person’s public movements that reflects a

²²⁷ *Id.*

²²⁸ *Id.*

²²⁹ *See id.* As the *Jones* plurality opinion implied, this does not provide a bright line for the police to follow.

²³⁰ *See id.* One wonders how this would be proved. Would the trial court have to take testimony from experts in order to make that determination? Would it be up to the trial court to make that judgment by taking judicial notice of certain facts without any testimony?

²³¹ *Id.* at 955 (Sotomayor, J., concurring).

²³² *United States v. Karo*, 468 U.S. 705, 708-10 (1984). The ether can with the beeper was initially tracked to one house, then another house two days later, then one day later to a storage facility, then to another storage facility, and eventually tracked for 140 miles to another house in another city. *Id.* It should be noted that the tracking information from location to location was permitted by the Court, but all location information when the can/beeper was inside any of the houses or storage structures was suppressed, *id.* at 714, even though two of the four occupants had no privacy interest in the house, *id.* at 720.

wealth of detail about her familial, political, professional, religious and sexual associations.²³³

Thus, Justice Sotomayor referred to a type of long-term surveillance or an accumulation of many short-term surveillance operations necessary to capture all of the delineated information. Around-the-clock surveillance of a person for one day would be unlikely to yield the comprehensive record she seemed concerned with. Justice Sotomayor also expressed concerns about the government mining a “substantial quantum of intimate information” for years, the potential for abuse of this type of governmental power, and the lack of judicial oversight over the government’s unfettered discretion to track whomever it chooses. She stressed that this type of surveillance “may ‘alter the relationship between citizen and government in a way that is inimical to democratic society.’”²³⁴ Justice Sotomayor’s concurrence leaves the unmistakable impression that she would look at the reason for aerial surveillance very carefully and examine what type of intimate information is being gathered before deciding whether even short-term (one- or two-day) aerial surveillance violates the Fourth Amendment. Only time will tell.

With respect to “long-term” or “prolonged” drone surveillance, Justice Sotomayor’s comments reflect a kind of “mosaic theory,” illustrated by the colloquialism that “the whole is greater than the sum of its parts.”²³⁵ Based on the principle of circumstantial evidence, each piece of a mosaic may seem trivial or insignificant on its own, but each acquires much greater meaning when assembled together in a pattern with all the others.²³⁶ The D.C. Circuit recognized this principle in the *Maynard* case when it explained, “[w]hat may seem trivial to the uninformed, may appear of great moment to one who has a broad view of the scene.”²³⁷ The Court went on to explain:

²³³ *Jones*, 132 S. Ct. at 955 (Sotomayor, J., concurring).

²³⁴ *Id.* at 956 (quoting *United States v. Cuevas-Perez*, 640 F.3d 272, 285 (7th Cir. 2011)).

²³⁵ See *United States v. Maynard*, 615 F.3d 544, 561 n.*, 562 (D.C. Cir. 2010), *aff’d sub nom.* *United States v. Jones*, 132 S. Ct. 945 (2012). It should be noted that the *Maynard* case led to the *Jones* opinion when the Supreme Court granted certiorari to the respondent Jones, who had been a co-defendant of Maynard in the lower court.

²³⁶ See *Maynard*, 615 F.3d at 562 (distinguishing between a matter of degree and one of kind, or a person’s “way of life” versus a day in the life of that person).

²³⁷ *Id.* at 562 (quoting *CIA v. Sims*, 471 U.S. 159, 178 (1985)). That Court pointed out that the prosecutor had used the importance of the “pattern” in his presentation of the case at trial. *Id.* at 562.

Prolonged surveillance reveals types of information not revealed by short-term surveillance, such as what a person does repeatedly, what he does not do, and what he does ensemble. These types of information can each reveal more about a person than does any individual trip viewed in isolation. *Repeated* visits to a church, a gym, a bar, or a bookie tell a story not told by any single visit, as does one's not visiting any of these places over the course of a month. The sequence of a person's movements can reveal still more; a single trip to a gynecologist's office tells little about a woman, but that trip followed a few weeks later by a visit to a baby supply store tells a different story. A person who knows all of another's travels can deduce whether he is a weekly church goer, a heavy drinker, a regular at the gym, an unfaithful husband, an outpatient receiving medical treatment, an associate of particular individuals or political groups—and not just one such fact about a person, but all such facts.²³⁸

Although not expressed in exactly the same way, these words likely reflect Justice Alito's underlying concern—as expressed in his concurring opinion in *Jones*—that justified his finding that the around-the-clock, twenty-eight day surveillance was “surely” too long.²³⁹ As Justice Alito stated, society would not expect that law enforcement will “secretly monitor and catalogue every single movement of an individual's car for a very long period.”²⁴⁰

Justice Scalia, writing for the majority, implied in his dicta that the twenty-four hour, twenty-eight day location-tracking surveillance could amount to the “dragnet-type law enforcement practices” that the Court referred to in *Knotts*.²⁴¹ *Knotts* had allowed single-trip, single-day location monitoring but found it unnecessary to consider a scenario that “involved twenty-four hour surveillance of any citizen of the country.”²⁴² It is difficult to determine whether Justice Scalia was broadly referring to around-the-clock surveillance of any specific citizen at any time for no reason at all, or if he was just referring to mass governmental surveillance of the entire population. Lower courts

²³⁸ *Id.* at 262 (emphasis added) (footnotes omitted).

²³⁹ See *supra* note 227.

²⁴⁰ *Jones*, 132 S. Ct. at 964 (Alito, J., concurring); see also *Maynard*, 615 F.3d at 560 (“[T]he whole of a person's movements over the course of a month is not actually exposed to the public because the likelihood a stranger would observe all those movements is not just remote, it is essentially nil. It is one thing for a passerby to observe or even to follow someone during a single journey as he goes to the market or returns home from work. It is another thing entirely for that stranger to pick up the scent again the next day and the day after that, week in and week out, dogging his prey until he has identified all the places, people, amusements, and chores that make up that person's hitherto private routine.”).

²⁴¹ See *Jones*, 132 S. Ct. at 951-52 n.6.

²⁴² See *id.* (quoting *United States v. Knotts*, 460 U.S. 276, 283 (1983)).

have broadly interpreted this language to refer to prolonged surveillance of a single individual, not just mass surveillance.²⁴³

On the other hand, Justice Scalia found the concurrence's short-term–long-term dichotomy unnecessary and questioned its application²⁴⁴: Why was “a 4-week investigation . . . ‘surely’ too long”? Why did the concurring Justices decide that the *Jones* “drug-trafficking conspiracy involving substantial amounts of cash and narcotics [was] not an ‘extraordinary offens[e]’ which [could] permit longer observation”? “What of a 2-day monitoring of a suspected purveyor of stolen electronics? Or of a 6-month monitoring of a suspected terrorist?”²⁴⁵ Indeed, by leaving the permissible length of the surveillance ambiguous, the concurring Justices failed to provide any type of bright line for law enforcement.

One more vote from any of the four majority Justices²⁴⁶ would support short-term drone surveillance, just as the Court did in *Knotts* and *Karo*. We must look at other opinions for any clues on the subject. Justices Kennedy and Scalia, who were both in the *Jones* majority, had previously joined the majority opinion in *Riley*, which upheld the short-term aerial surveillance and photography of a greenhouse located within the curtilage of a home.²⁴⁷ Since the curtilage has traditionally received greater protection than public highways, it follows that one or both of these Justices would likely uphold short-term drone surveillance of a person's movements on public highways. Moreover, we also know that the Court has previously rejected any distinction between routine police surveillance and surveillance that is specifically focused on a particular person.²⁴⁸

We can probably conclude that the current Court would uphold warrantless and suspicionless drone surveillance for a period of six days or less. Moreover, drone surveillance covering a distance of 200 miles or less would also be permissible. Twenty-eight days of around-the-clock surveillance, however, would likely violate the Fourth Amendment, except in the case of an “extraordinary” offense. As Justice Scalia pointed out, five Justices believed that a drug conspiracy like the one in *Jones*

²⁴³ See *Maynard*, 615 F.3d at 556-58; see also, e.g., *United States v. Butts*, 729 F.2d 1514, 1518 n.4 (5th Cir. 1984).

²⁴⁴ *Jones*, 132 S. Ct. at 954.

²⁴⁵ *Id.*

²⁴⁶ Justices Scalia, Roberts, Kennedy, and Thomas.

²⁴⁷ See *Florida v. Riley*, 488 U.S. 445 (1989).

²⁴⁸ See *California v. Ciraolo*, 476 U.S. 207, 214 n.2 (1986).

would not qualify as “extraordinary.” A terrorist threat could qualify, however, as such and thereby allow prolonged, around-the-clock drone surveillance. Another potentially “extraordinary” offense could arise in an organized crime investigation where the investigation has been unable to infiltrate the conspiracy.²⁴⁹ Except for the “extraordinary” case, however, we can rest assured that the Court will not allow a “surveillance state”²⁵⁰ where the government constantly monitors our way of life.

At the same time, practical issues surrounding drone surveillance are also likely to limit their long-term, around-the-clock use. The FAA will predictably impose safety regulations requiring constant monitoring of drones for safety reasons, primarily to avoid interference or collisions with other aircraft in navigable airspace. Safety concerns would also limit the number of drones in any particular airspace. Because of these practical limitations, most investigations will likely consist of only one or a series of short-term surveillance operations.

Nevertheless, the Court needs to adopt a bright-line rule that law enforcement can understand and use. Failure to do so will present an unacceptable level of uncertainty for both the public and the police in determining the scope of permissible surveillance of public places. Despite these challenges, the Court could logically start by excluding any *warrantless*, twenty-four hour drone surveillance lasting longer than a few days. A one-week limit may provide an appropriate demarcation, since that period of time likely will not reveal the kinds of repeated activities that would produce a mosaic effect, thereby alleviating many of the concerns shared by some of the Justices. A one-week limitation would also be consistent with *Jones*, *Knotts*, and *Karo*. The corollary of such a rule would be that the police would have to justify any warrantless surveillance in excess of that time by offering some other circumstances or through another exception to the warrant requirement.

Next, we must consider drone surveillance of “open fields.” As will be seen below, a significant body of law exists concerning the Fourth Amendment and “open fields.”

²⁴⁹ Necessity could come into play, for example, by analogy to the requirements for obtaining a wiretap. In general, wiretap warrants are not obtainable unless there is a showing of necessity: i.e. that “other investigative procedures have been tried and failed or why they reasonably appear to be unlikely to succeed if tried or to be too dangerous.” 18 U.S.C. 2518(c).

²⁵⁰ This refers to indiscriminate mass surveillance by government as described in George Orwell’s novel, *1984*. See ORWELL, *supra* note 13. I have tried throughout this article not to refer to this overly-mentioned novel, although its themes are indeed appropriate.

D. Drone Surveillance of “Open Fields”

In the leading case of *Oliver v. United States*,²⁵¹ the Supreme Court reaffirmed the common law “open fields” doctrine. Under this doctrine, law enforcement may freely “enter and search a field without a warrant,”²⁵² and thus, the intrusion does not constitute an “unreasonable search” under the Fourth Amendment.²⁵³ As the Court explained in *Hester v. United States*, “the special protection accorded by the Fourth Amendment to the people in their ‘persons, houses, papers, and effects,’ is not extended to the open fields. The distinction between the latter and the house is as old as the common law.”²⁵⁴ Moreover, as explained by the *Oliver* Court, this conclusion derives “from the text of the Fourth Amendment and from the historical and contemporary understanding of its purposes”²⁵⁵ An open field is simply not an “effect” of a person.

In *Oliver*, the Court held that even if the defendant held a subjective expectation of privacy, *Katz*’s second prong was not satisfied as to activities conducted outdoors in fields.²⁵⁶ As the Court explained:

[O]pen fields do not provide the setting for those intimate activities that the Amendment is intended to shelter from government interference or surveillance. There is no societal interest in protecting the privacy of those activities, such as the cultivation of crops, that occur in open fields. Moreover, as a practical matter these lands usually are accessible to the public and the police in ways that a home, an office, or commercial structure would not be. It is not generally true that fences or “No Trespassing” signs effectively bar the public from viewing open fields in rural areas. And both petitioner *Oliver* and respondent Thornton concede that the public and police lawfully may survey lands from the air. For these reasons, the asserted expectation of privacy in open fields is not an expectation that “society recognizes as reasonable.”²⁵⁷

²⁵¹ *Oliver v. United States*, 466 U.S. 170, 177-81 (1984). The decision confirmed that the *Katz* decision had not changed the open fields doctrine.

²⁵² *Id.* at 173 (citing *Hester v. United States*, 265 U.S. 57 (1924)).

²⁵³ *Id.* at 177.

²⁵⁴ *Hester*, 265 U.S. at 59.

²⁵⁵ *Oliver*, 466 U.S. at 181.

²⁵⁶ *Id.* at 178. In *Oliver*, two officers went to the defendant’s farm, “drove past [his] house to a locked gate with a “No Trespassing” sign[,] . . . walked around the gate and along the road for several hundred yards, pass[ed] a barn and a parked camper[,] . . . and found a field of marihuana over a mile from [the house].” *Id.* at 173.

²⁵⁷ *Id.* at 179 (footnotes omitted).

An “open field” need not be “open” nor a “field,” as those terms are commonly used.²⁵⁸ The term “may include any unoccupied or undeveloped area outside of the curtilage,” including a “thickly wooded area.”²⁵⁹ In *United States v. Dunn*, the Court identified four factors for determining whether the area at issue qualifies as an open field or as part of the curtilage:

[T]he proximity of the area claimed to be curtilage to the home, whether the area is included within an enclosure surrounding the home, the nature of the uses to which the area is put, and the steps taken by the resident to protect the area from observation by people passing by.²⁶⁰

When applying these factors, lower courts have found that even areas close to the home can be considered “open fields.”²⁶¹

The Supreme Court has rejected a case-by-case analysis in order to determine whether an open field was entitled to Fourth Amendment protection.²⁶² It has also found that in the “open fields” context, “the common law of trespass [has] little or no relevance to the applicability of the Fourth Amendment.”²⁶³

The *Oliver* Court held that aerial surveillance of open fields by the police does not violate the Fourth Amendment.²⁶⁴ The *Dow* Court reiterated that “the public and police lawfully

²⁵⁸ *Dow Chem. Co. v. United States*, 476 U.S. 227, 236 (1986) (quoting *Oliver*, 466 U.S. at 180 n.11).

²⁵⁹ *Oliver*, 466 U.S. at 180 n.11.

²⁶⁰ *United States v. Dunn*, 480 U.S. 294, 301 (1987).

²⁶¹ See, e.g., *United States v. Boyster*, 436 F.3d 986, 991 (8th Cir. 2006) (unenclosed field located over 100 yards from a home that was not used for “any legitimate purpose” was not within the curtilage, where no precaution had been made to keep it from being visible to onlookers); *United States v. Breza*, 308 F.3d 430 (4th Cir. 2002) (a vegetable garden used to grow marijuana was an open field, despite its location fifty feet from the home and its separate enclosure by an interior fence that clearly demarcated it from the rest of the landscaping around the house); *United States v. Broadhurst*, 805 F.2d 849 (9th Cir. 1986) (finding a greenhouse that was 125 yards from the home, separated by hills, grass, and oak trees and with no road leading from the house to the greenhouse, was open to public view, and thus defendant had no reasonable privacy expectation); *United States v. Waterfield*, No. 2:05-cr-169, 2006 WL 1645068 (S.D. Ohio June 8, 2006) (an area thirty-three feet from a home and a greenhouse eighty feet from that home were deemed to be open fields where the area next to the greenhouse was being used solely to grow marijuana); *State v. Marolda*, 927 A.2d 154 (N.J. 2007) (a cornfield with marijuana growing in it was not within the curtilage even though the field was *directly adjacent* to the house; only a row of weeds separated the cornfield from the house).

²⁶² See *Oliver*, 466 U.S. at 181-82.

²⁶³ *Id.* at 183-84. This is an interesting comment, considering that trespass was the trigger for the *Jones* majority to find a Fourth Amendment violation when the police planted the GPS device on the defendant’s car. The trespass on a person’s real property outside the curtilage is not a basis for finding a constitutional violation. In other words, the trespass must be on the proprietary interest enumerated in the Fourth Amendment—“houses, papers, and [personal] effects.” *Id.* at 185.

²⁶⁴ *Id.* at 183-84.

may survey lands from the air” where those lands represent open fields.²⁶⁵ *Dow* thus allowed aerial surveillance of an industrial complex by finding an analogy to open fields.²⁶⁶ It follows, then, that drone surveillance of open fields would not violate the Fourth Amendment any more than drone surveillance of public highways and other public places.²⁶⁷ Open fields and public places are thus equivalent for the purpose of privacy analysis,²⁶⁸ with the result that the length of permissible surveillance would not differ between them. Accordingly, surveillance of open fields would be equally limited to short-term surveillance in order to avoid the mosaic pattern of long-term surveillance condemned by the concurring opinions in *Jones*.

E. Drone Surveillance of the Curtilage

Despite the fact that the Fourth Amendment does not delineate the curtilage as a protected area, the Supreme Court has nonetheless protected that area as though it were part of the house itself.²⁶⁹ The courts have “defined the curtilage, as did the common law, by reference to the factors that determine whether an individual reasonably may expect that an area immediately adjacent to the home will remain private.”²⁷⁰ The *Ciraolo* Court further explained:

At common law, the curtilage is the area to which extends the intimate activity associated with the “sanctity of a man’s home and the privacies of life.” The protection afforded the curtilage is essentially a protection of families and personal privacy in an area intimately linked to the home, both physically and psychologically, where privacy expectations are most heightened.²⁷¹

As discussed above, the four *Dunn* factors apply in determining whether an area falls within the curtilage of the

²⁶⁵ *Dow Chem. Co. v. United States*, 476 U.S. 227, 238 (1986) (quoting *Oliver*, 466 U.S. at 179).

²⁶⁶ *Id.* at 239.

²⁶⁷ The issue of “prolonged” surveillance of open fields would be the same as one of public places.

²⁶⁸ See *United States v. Knotts*, 460 U.S. 275, 282 (1983) (implicitly equating public highways and open fields). “[N]o such expectation of privacy extended to the visual observation of Petschen’s automobile arriving on his premises after leaving a public highway, nor to movements of objects such as the drum of chloroform outside the cabin in the ‘open fields.’” *Id.*

²⁶⁹ See *Oliver*, 466 U.S. at 180.

²⁷⁰ *Id.*

²⁷¹ *California v. Ciraolo*, 476 U.S. 207, 212-13 (1986) (citation omitted) (internal quotation marks omitted).

home. However, the Court has cautioned against a mechanical application of these factors,²⁷² pointing out that they are merely useful analytical tools that can help decide “whether the area in question is so intimately tied to the home itself that it should be placed under the home’s ‘umbrella’ of Fourth Amendment protection.”²⁷³ The area’s proximity to the home represents only one factor in the analysis and is not by itself determinative. There is no specific distance at which point the curtilage ends.²⁷⁴ Moreover, with respect to fences, a fence that encircles the home suggests that everything located within the fence falls within the curtilage.²⁷⁵ However, interior fences that separate part of the yard from the home suggest that that area falls outside the curtilage.²⁷⁶

Yet, despite the strong language associating the curtilage with the home, the Court has distinguished their relative protections in aerial surveillance cases in light of the fact that they simply are not the same. Indeed, the curtilage does not receive the same protection as the home because it often remains exposed to public view from the ground or from the air.²⁷⁷ As the Court has explained, “That the area is within the curtilage does not itself bar all police observation.”²⁷⁸ The Court has based this conclusion on the rationale of the oft-quoted statement in *Katz*: “What a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection.”²⁷⁹

In both *Ciraolo* and *Riley*, the Court allowed the aerial surveillance of the curtilage of a home.²⁸⁰ Specifically, *Ciraolo* involved the fenced-in backyard of a home, and *Riley* involved a greenhouse located ten to twenty feet behind a mobile home.²⁸¹ Indeed, the Court in *Kyllo v. United States* later reiterated

²⁷² *United States v. Dunn*, 480 U.S. 294, 301 (1987).

²⁷³ *Id.* For an example of a court applying the *Dunn* factors, see *United States v. Jenkins*, 124 F.3d 768, 773 (6th Cir. 1997) (finding defendant’s backyard was within the curtilage, where the backyard was encircled on three sides by a wire fence, was used as a garden with flowers and numerous small trees, and was shielded from public view by the house).

²⁷⁴ *United States v. Breza*, 308 F.3d 430, 435 (4th Cir. 2002) (quoting *United States v. Depew*, 8 F.3d 1424, 1427 (9th Cir. 1993)).

²⁷⁵ *Dunn*, 480 U.S. at 301-02.

²⁷⁶ *Breza*, 308 F.3d at 436.

²⁷⁷ See *Kyllo v. United States*, 533 U.S. 27, 33-34 (2001) (“[T]he technology enabling human flight has exposed to public view (and hence . . . to official observation) uncovered portions of the house and its curtilage that once were private.”).

²⁷⁸ *California v. Ciraolo*, 476 U.S. 207, 213 (1986).

²⁷⁹ *Id.* (quoting *Katz v. United States*, 389 U.S. 347, 351 (1967)).

²⁸⁰ *Florida v. Riley*, 488 U.S. 445, 452 (1989); *Ciraolo*, 476 U.S. at 214.

²⁸¹ *Riley*, 488 U.S. at 448; *Ciraolo*, 476 U.S. at 209.

these holdings, explaining that “aerial surveillance of private homes and surrounding areas does not constitute a search.”²⁸² The Court has also emphasized that no constitutional violation occurs if the officer’s observations were made from a “public vantage point where he has a right to be and which renders the activities clearly visible.”²⁸³ Justices Scalia and Kennedy joined the majority opinions in both *Riley* and *Jones*, and they remain on the Court that could decide the drone surveillance issue today.²⁸⁴

In contrast to the small airplane used in *Ciraolo*, the *Riley* decision involved a helicopter hovering over a home’s curtilage at an altitude of four hundred feet.²⁸⁵ Five Justices agreed that no constitutional violation resulted from surveillance at that altitude because it was “routine” for public and private helicopters to fly at that altitude.²⁸⁶ Appropriately, the dissent expressed concern about the plurality’s failure to define any “meaningful [altitude] limit.” In the context of drones, the Court would likely permit the use of drones as long as they remain within an altitude commonly used by private or public planes, helicopters, or other drones in general.²⁸⁷

Lower courts’ applications of the *Ciraolo* and *Riley* precedents may also offer insight on how the post-*Jones* Court might treat drone surveillance of the curtilage. For instance, lower courts have considered other factors relevant when applying the reasoning of *Ciraolo* and *Riley*, beyond the frequency of flyovers by public aircraft. In particular, courts have considered the “total number of instances of surveillance, the frequency of surveillance, the length of each surveillance, the altitude of the aircraft,”²⁸⁸ the degree of disruption of

²⁸² *Kyllo*, 533 U.S. at 33 (citing *Ciraolo*, 476 U.S. at 213; *Riley*, 488 U.S. 445).

²⁸³ *Ciraolo*, 476 U.S. at 213 (citing *United States v. Knotts*, 460 U.S. 275, 282 (1983)).

²⁸⁴ Although Justices Scalia and Kennedy were on opposing sides in *Kyllo*, Justice Kennedy joined the dissenting opinion in *Kyllo* that would have found the monitoring of heat radiating from the home permissible. *Kyllo*, 533 U.S. at 41 (Stevens, J., dissenting).

²⁸⁵ *Riley*, 488 U.S. at 448.

²⁸⁶ *Id.* at 450-51.

²⁸⁷ In *Riley*, Justice O’Connor seemed to draw the line at 400 feet but did so only because the record on appeal was limited to that altitude. *Id.* at 452 (O’Connor, J., concurring). Her opinion should not be interpreted to signify that any surveillance at a lower altitude would not be permissible.

²⁸⁸ *Giancola v. W. Va. Dep’t of Pub. Safety*, 830 F.2d 547, 550-51 (4th Cir. 1987).

legitimate activities on the ground,²⁸⁹ and whether the surveillance violated any flight regulations.²⁹⁰

Among the lower courts, helicopter overflights at altitudes of 100 to 300 feet have been found permissible.²⁹¹ Courts have also allowed photographs to be taken of urban backyards from an altitude of 500 feet.²⁹² The Ninth Circuit has aptly stated that “the Constitution does not require one to build an opaque bubble over himself to claim a reasonable expectation of privacy,” but “[w]here the bubble he builds . . . allows persons in navigable airspace to view his illicit activity, whatever expectation of privacy he has certainly is not reasonable.”²⁹³

Drone altitude does not present the only concern, however. Indeed, the invasion of the “intimacy” of the curtilage is an even more important factor. The Court has previously stated that all details of the home are intimate, and that a distinction cannot be drawn between home activities that are intimate and those that are not.²⁹⁴ At the same time, the Court has treated the curtilage as an area “intimately linked to the home”²⁹⁵ For instance, the *Riley* plurality emphasized that

²⁸⁹ See *Pew v. Scopino*, 904 F. Supp. 18, 27 (D. Me. 1995) (violation of Fourth Amendment where helicopter created “excessive noise, wind, dust and disruption of human activities including physical injury to chattels”; an altitude of forty feet above roof was not within the so-called “safe zone” for engine failure”; and such “lack of safety would . . . take these . . . flights out of navigable airspace”).

²⁹⁰ See *State v. Little*, 918 N.E.2d 230, 238 (Ohio Ct. App. 2009) (violation because the flight over the home and curtilage at an altitude of 100 feet was within five miles of an international airport where the airspace was “tightly governed by FAA regulations and [was] essentially a ‘no-fly’ zone”).

²⁹¹ See, e.g., *United States v. Breza*, 308 F.3d 430 (4th Cir. 2002) (200 feet); *Giancola*, 830 F.2d at 548, 550-51 (100 feet); *United States v. Young*, No. 2:09-cr-00223, 2010 U.S. Dist. LEXIS 15103, at *5 (S.D.W. Va. Feb. 22, 2010), *aff’d*, No. 11-4379, 477 Fed. App’x 976 (4th Cir. Apr. 30, 2012), *cert. denied*, 133 S. Ct. 463 (Oct. 9, 2012) (300 feet); *Doggett v. State*, 791 So. 2d 1043, 1055-56 (Ala. Crim. App. 2000).

²⁹² See *Henderson v. People*, 879 P.2d 383, 385-86 (Colo. 1994) (police helicopter made four or five passes over defendant’s house and shed during a period of five minutes and took photographs of plastic covered shed behind the house). The dissent would have found a Fourth Amendment violation by applying *Ciraolo* and *Riley* because (1) flying four or five passes over the home and curtilage for five minutes posed a great degree of intrusion in a constitutionally protected area; (2) the marijuana in the shed was not in plain public view because of the multilayered plastic covering; and (3) the home was not within the path of any air traffic and had not been overflown by other helicopters or airplanes. *Id.* at 399-400; see also *People v. Romo*, 198 Cal. App. 3d 581, 588 (Cal. Ct. App. 1988) (fenced-in backyard in the City of Ukiah; the court made it clear that it was ruling strictly on the facts of the case and that it was “not sanctioning aerial acrobatics such as interminable hovering, a persistent overfly, a treetop observation, all accompanied by the thrashing of the rotor, the clouds of dust, and earsplitting din”) (internal quotation marks omitted).

²⁹³ *United States v. Broadhurst*, 805 F.2d 849, 856 (9th Cir. 1986) (citations omitted).

²⁹⁴ See *Kyllo v. United States*, 533 U.S. 27, 37-38 (2001).

²⁹⁵ *California v. Ciraolo*, 476 U.S. 207, 212-13 (1986).

its decision depended in part on the fact that “no intimate details connected with the use of the home or *curtilage* were observed”²⁹⁶ Accordingly, one could conclude that the plurality would have likely found a constitutional violation if “intimate details” of the curtilage *had* been observed.

Because of the Court’s respect for the “intimate details” of the home, it would likely impose limits on police drone surveillance where the use of drones constituted an exercise in voyeurism of “intimate” activities in a person’s backyard.²⁹⁷ But, if the Court chooses to do so by specifically limiting observation of only intimate activities within the curtilage, the Court would face the difficulty of distinguishing between intimate and non-intimate details, as Justice Brennan noted in his dissent in *Riley*.²⁹⁸ Such a test would also create a logistical nightmare for officers in the field, who would have to decide *on-the-fly* whether or not their observation will capture an intimate detail. In addition, an intimacy-based rule would provide the criminal defendant with a tool to exclude any aerial surveillance of the curtilage by simply placing a sunbather²⁹⁹ in the curtilage next to an illegal activity. This approach would ultimately prove unworkable. The only remaining option would be to ban all warrantless drone surveillance of the curtilage,³⁰⁰ a result that would run counter to the *Ciraolo–Riley–Kyllo* line of cases.

²⁹⁶ Florida v. Riley, 488 U.S. 445, 452 (1989) (emphasis added). The plurality’s other consideration that there was “no undue noise, and no wind, dust or threat of injury,” *id.*, is not likely to come into play with drones because they are designed to operate in stealth mode and can avoid causing any of these disturbances.

²⁹⁷ Such activities might include, for example, consensual sexual activity, nude sunbathing, and the like. It will probably become very common for paparazzi to use drones to take nude or semi-nude pictures of celebrities in their own backyards. Although the latter is just an example of a possible use of drones, the Fourth Amendment does not apply to civilians conducting their own searches of others.

²⁹⁸ See *Riley*, 488 U.S. at 463 (Brennan, J., dissenting); see also *Oliver v. United States*, 466 U.S. 170, 181-82 (1984) (“Nor would a case-by-case approach provide a workable accommodation between the needs of law enforcement and the interests protected by the Fourth Amendment The lawfulness of a search would turn on ‘[a] highly sophisticated set of rules, qualified by all sorts of ifs, ands, and buts and requiring the drawing of subtle nuances and hairline distinctions[.]’ This Court repeatedly has acknowledged the difficulties created for courts, police, and citizens by an ad hoc, case-by-case definition of Fourth Amendment standards to be applied in differing factual circumstances. The ad hoc approach not only makes it difficult for the policeman to discern the scope of his authority, it also creates a danger that constitutional rights will be arbitrarily and inequitably enforced.” (first alteration in original) (citations omitted) (internal quotation marks omitted)).

²⁹⁹ See *supra* note 297 and accompanying text.

³⁰⁰ That is one of the recommendations of the ACLU. See JAY STANLEY & CATHERINE CRUMP, ACLU, PROTECTING PRIVACY FROM AERIAL SURVEILLANCE: RECOMMENDATIONS FOR GOVERNMENT USE OF DRONE AIRCRAFT 15 (2011). The report

The technological enhancement of naked-eye perception has also generated concerns for the Court.³⁰¹ The *Dow* Court permitted photography with a “conventional, albeit precise, commercial camera commonly used in mapmaking” in the “open fields” context of an industrial complex.³⁰² *Dow*’s majority decision triggered a forceful dissent, which pointed out that, despite the majority’s conclusion to the contrary, the camera utilized in the case was in fact very sophisticated and could produce photographs that could be enhanced to show objects as small as half an inch.³⁰³ Some lower courts have also allowed aerial photography when applying the rule of *Ciraolo* and *Riley*, without any discussion of the sophistication of the cameras. For example, the courts in *People v. Romo* and *Henderson v. People* both upheld the use of photography of the curtilage from an altitude of 500 feet.³⁰⁴

By contrast, the *Kyllo* decision addressed activities within the home when it prohibited the use of technologically enhanced thermal imaging.³⁰⁵ Nevertheless, both *Dow* and *Kyllo* referred to technology “not generally available to the public” as a limiting principle.³⁰⁶ These cases do not offer easy predictions about what the Court will do with drone photography of the curtilage. This is especially true when the technology of even common smartphones produces very detailed photographs from a distance.³⁰⁷ Consistent with improvements in the technology of today’s cameras,³⁰⁸ drones can obtain equally detailed photography from altitudes higher than in *Dow*.

also said that drone usage should be limited to instances in which police believe they can collect evidence on a specific crime. *Id.*

³⁰¹ *Kyllo v. United States*, 533 U.S. 27, 33 (2001).

³⁰² *Dow Chem. Co. v. United States*, 476 U.S. 227, 238-39 (1986). The majority did caution that it was not opening the floodgates to all photography however sophisticated it might be: “It may well be, as the Government concedes, that 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 warrant.” *Id.* at 238 (emphasis added).

³⁰³ *Id.* at 242-43 (Powell, J., dissenting).

³⁰⁴ *People v. Romo*, 243 Cal. Rptr. 801, 805-06 (Cal. Ct. App. 1988); *Henderson v. People*, 879 P.2d 383, 385 (Colo. 1994).

³⁰⁵ *See Kyllo*, 533 U.S. at 40.

³⁰⁶ *See Kyllo*, 533 U.S. at 40; *see also supra* note 102.

³⁰⁷ *See* “Dot,” Kogeto’s “professional-level panoramic” camera that is available for \$49 for the iPhone. KOGETO, *Say Hello to Dot*, <http://www.kogeto.com/say-hello-to-dot> (last visited Mar. 1, 2013). “Dot” is easily capable of taking 360 degree videos and in conjunction with an iPhone app, easily sharing those videos via social media. *Id.*

³⁰⁸ For example, the ARGUS-IS imaging system has a “1.8 gigapixel camera that the Army says can ‘track people and vehicles from altitudes above 20,000 feet[]’ . . . from almost 25 miles down range.” *See* Andrew Munchbach, *US Army’s A160 Hummingbird Drone-Copter to Don 1.8 Gigapixel Camera*, ENGADGET.COM (Dec. 27,

Unlimited retention of photographs and videos from drone surveillance presents another major concern. Justice Sotomayor was troubled by the potential “mining” of such information by the government over the course of years.³⁰⁹ A statutory retention limitation would provide the best practical solution for this legitimate concern. For instance, Congress could impose a time limit for storing this information if “there is [no] reasonable suspicion that the images contain evidence of criminal activity or are relevant to an ongoing investigation or pending criminal trial.”³¹⁰

In conclusion, the Court will consider a number of factors when reviewing drone surveillance of the curtilage, including “the total number of instances of surveillance, the frequency of surveillance, the length of each surveillance, the altitude of the aircraft, the degree of disruption of legitimate activities on the ground,” the frequency commonality of public flights in that airspace, “and whether any flight regulations were violated by the surveillance.”³¹¹ The Court should, and probably will, permit short warrantless drone surveillance from an altitude within navigable airspace, so long as it does not create undue noise, wind, dust, or threat of injury, and does not interfere with the normal use of the curtilage.³¹² The permissible duration of surveillance should be much shorter for the curtilage than for public places, perhaps as short as one day, in light of the greater privacy protection that should be afforded to the intimacy of the curtilage. In any event, the Court is unlikely to condone indiscriminate surveillance of the curtilage for unlimited periods of time.³¹³ The Court will likely allow limited photography of the curtilage with a camera

2011, 11:34 PM), <http://www.engadget.com/2011/12/27/us-armys-a160-hummingbird-drone-copter-to-don-1-8-gigapixel-cam/>.

³⁰⁹ *United States v. Jones*, 132 S. Ct. 945, 956 (2012) (Sotomayor, J., concurring).

³¹⁰ See STANLEY & CRUMP, *supra* note 300, at 16. The Center for Democracy and Technology, a Washington based civil liberties group, has also called for such limits. See Somini Sengupta, *Drones May Set Off a Flurry of Lawsuits*, N.Y. TIMES (Feb. 20, 2012, 1:28 PM), <http://bits.blogs.nytimes.com/2012/02/20/drones-may-set-off-a-flurry-of-lawsuits/>. The ACLU report also recommends, among other things, that the policies and procedures for use of the drones be made public and that independent audits take place to check on the use of drones by the government. STANLEY & CRUMP, *supra* note 300, at 16.

³¹¹ See *Giancola v. W. Va. Dep't of Pub. Safety*, 830 F.2d 547, 550-51 (4th Cir. 1987).

³¹² The Court will not allow any “short” surveillance of the curtilage to be longer than what is permissible in public places. See discussion *supra* Part V.B. It should be shorter because of the greater privacy protection afforded to the curtilage.

³¹³ See *United States v. Allen*, 633 F.2d 1282, 1289 n.5 (9th Cir. 1980).

containing technology commonly available to the public.³¹⁴ Indiscriminate continuous video surveillance of the curtilage, however, will not be acceptable because surveillance of this sort would bring us closer to the Orwellian state.³¹⁵

F. Drone Surveillance of the Interior of the Home

Time and time again, the Court has taken a firm stand against warrantless governmental invasion of the home.

At the very core of the Fourth Amendment stands the right of a man to retreat into his own home and there be free from unreasonable government intrusion. With few exceptions, the question whether a warrantless search of a home is reasonable and hence constitutional must be answered no.³¹⁶

Drones such as the Nano Hummingbird are capable of stealthily entering the home and recording or relaying observations from within.³¹⁷ Because *Jones* involved only surveillance on public roads, and not the search of a home, a review of *Kyllo*'s legacy will offer some insight into how the Court would respond to aerial surveillance of the interior of a home. As far as photographs of the *exterior* of the house, that issue would fit within the curtilage analysis above. It is abundantly clear that the Court should and will continue to be very protective of the *interior* of homes, however.³¹⁸ As an initial matter, the Court simply will not allow any drone to physically enter the home based on any theory of the Fourth Amendment, including trespass, reasonable expectation of privacy, or any other test.

But how will the Court resolve photography of the interior of the home from a drone lawfully hovering above, in

³¹⁴ See *Dow Chem. Co. v. United States*, 476 U.S. 227, 238-39 (1986) (As an alternative, the trial court could use a “naked-eye” standard and hold a hearing to determine what could be seen by the naked eye and compare it to the photographs; this could be a rather complicated and lengthy process involving expert testimony.)

³¹⁵ See ORWELL, *supra* note 13; see also *United States v. Cuevas-Sanchez*, 821 F.2d 248, 251 (5th Cir. 1987). There is also a concern about the “concomitant chill” that such surveillance would have on “lawful outdoor activity.” *People v. Cook*, 710 P.2d 299, 302 (Cal. 1985). This conclusion necessarily follows from the concurrences in *Jones* that would not even allow “long-term” surveillance of public highways, an area that enjoys less privacy protection than the curtilage

³¹⁶ *Kyllo v. United States*, 533 U.S. 27, 31 (2001) (citations omitted) (internal quotation marks omitted).

³¹⁷ See *supra* note 40 and accompanying text.

³¹⁸ “[T]he Fourth Amendment draws a firm line at the entrance to the house. That line, we think, must be not only firm but also bright—which requires clear specification of those methods of surveillance that require a warrant.” *Kyllo*, 533 U.S. at 40 (citations omitted) (internal quotation marks omitted).

the navigable airspace, without making an actual physical intrusion? For example, how would the Court respond to photographs of the home's interior taken through open windows or skylights? Or how would it react to infrared photographs of the home by day or by night? At first glance, it would appear that the aerial surveillance cases would govern the issue of drone surveillance from above the home. In *Dow*, the Court approved of aerial photographs,³¹⁹ but that decision offers limited insight because the Court treated the manufacturing complex as "more comparable to an open field" than to the curtilage.³²⁰ Since the home has always been entitled to greater protection than even the curtilage, it follows that one cannot infer much from *Dow* in the context of aerial photographs of the interior of the home.

The Court is unlikely to allow resort to the plain view (exposed to the public) doctrine merely because windows or skylights are left open, since this would open the floodgates to invasion of the interior of the home by advancing technology. The Court will most likely employ a rationale similar to *Kyllo* when addressing these issues. The *Jones* opinions did not address these issues with respect to the interior of the home, but the Court has previously indicated that Fourth Amendment protection *may* also apply to any information obtained by "sense-enhancing technology" that "could not otherwise have otherwise been obtained without physical intrusion into a constitutionally protected area"³²¹ The issue, as the majority put it in *Kyllo*, boils down to the question of "what limits [should exist] upon th[e] power of technology to shrink the realm of guaranteed privacy."³²²

The five-to-four *Kyllo* majority³²³ held that a "search" occurred when the police used a relatively crude thermal-imaging device from a public street in order to detect relative amounts of heat within the home.³²⁴ The imager detected that the "roof over the garage and a side wall of the petitioner's home were relatively hot[ter than] the rest of the home and

³¹⁹ *Dow Chem. Co. v. United States*, 476 U.S. 227 (1986).

³²⁰ *Id.* at 239.

³²¹ See *Kyllo*, 533 U.S. at 34 (citations omitted) (internal quotation marks omitted).

³²² *Id.*

³²³ Of the 5-4 *Kyllo* decision, four of the majority Justices are still on the Court and Justice Kennedy is the only dissenting Justice remaining on the Court today. The *Jones* decision involved all five of these Justices.

³²⁴ *Kyllo*, 533 U.S. at 34.

substantially warmer than neighboring homes”³²⁵ In fact, the thermal imager did not physically intrude into the home, no intimate details of the home were detected, the imager only passively captured heat escaping from the *outside* of the home, and there may not have been any “significant compromise of the homeowner’s privacy”³²⁶ Nevertheless, the majority declined to use those facts as the measuring tool for Fourth Amendment violations. Rather, the Court declared that it “must take the *long view*, from the original meaning of the Fourth Amendment forward.”³²⁷

The majority proceeded to explain that obtaining “any information regarding the *interior* of the home that could not otherwise have been obtained without physical ‘intrusion into a constitutionally protected area’ constitutes a search—at least where (as here) the technology in question is not in general public use.”³²⁸ It rejected the dissent’s argument that the imager detected no information about the interior of the home except that which could be inferred from detecting the heat emanating outside of the home.³²⁹

The majority also rejected a distinction between “through-the-wall surveillance” and “off-the-wall surveillance,” indicating that “off-the-wall” heat detection is analogous to other impermissible surveillances such as using a powerful directional microphone to pick up sound waves coming out of the house or a satellite to scan the house for visible light waves emanating from the house.³³⁰ But, as the dissent pointed out, there is no practical difference between measuring heat emanating from a house and detecting “traces of smoke, suspicious odors, odorless gasses, airborne particulates, or radioactive emissions” that could also emerge from it.³³¹ The

³²⁵ *Id.* at 30. That information suggested that there was an unusual amount of heat within the home consistent with cultivation of marijuana, and the information was used, among other things, to obtain a search warrant for the home. *Id.* at 30.

³²⁶ *Id.* at 40.

³²⁷ *Id.* (emphasis added). The majority seemingly focused on the future advances of technology rather than the particular technology at hand. *See id.* at 51 (Stevens, J., dissenting) (“Although the Court is properly and commendably concerned about the threats to privacy that may flow from advances in the technology available to the law enforcement profession, it has unfortunately failed to heed the tried and true counsel of judicial restraint. Instead of concentrating on the rather mundane issue that is actually presented by the case before it, the Court has endeavored to craft an all-encompassing rule for the future.”).

³²⁸ *Id.* at 34 (majority opinion) (emphasis added) (citation omitted).

³²⁹ *Id.* at 35 n.2.

³³⁰ *Id.* at 35.

³³¹ *Id.* at 45 (Stevens, J., dissenting).

dissent argued that monitoring the latter with “sense-enhancing technology” would be permissible, “and drawing useful conclusions from such monitoring [would seem to be] an entirely reasonable public service.”³³²

The Achilles heel of the *Kyllo* decision is that the majority qualified its decision by restricting only technology “not in general public use” at the time, without defining any criteria for determining when a device so qualifies.³³³ If this test were literally used as a threshold criterion, privacy would continue to erode as technology improves and becomes generally available to the public.³³⁴

In *Dow*, the Court also emphasized that the type of camera used was a “conventional, albeit precise, commercial camera commonly used in mapmaking.”³³⁵ By design and because of technological advances over the past several years, however, a drone’s cameras (whether infrared or conventional) today would be far more technologically sophisticated than the mapping camera used in *Dow*.

More than twenty years have elapsed since *Kyllo*. The public now commonly uses the infrared technology of thermal imagery in infrared cameras³³⁶ and in night goggles.³³⁷ Does that mean that the use of thermal imagery or night goggles to

³³² *Id.* (Stevens, J., dissenting) (citation omitted).

³³³ *Id.* at 34.

³³⁴ As Justice Stevens pointed out in his dissent:

[T]he contours of [the majority’s] new rule are uncertain because its protection apparently dissipates as soon as the relevant technology is “in general public use.” Yet how much use is general public use is not even hinted at by the Court’s opinion, which makes the somewhat doubtful assumption that the thermal imager used in this case does not satisfy that criterion. . . . [T]his criterion is somewhat perverse because it seems likely that the threat to privacy will grow, rather than recede, as the use of intrusive equipment becomes more readily available.

Id. at 47 (Stevens, J., dissenting) (citation omitted).

³³⁵ *Dow Chem. Co. v. United States*, 476 U.S. 227, 238 (1986).

³³⁶ See Penney, *supra* note 85, at 512 (“Since *Kyllo* was decided, infrared cameras have become more affordable, portable, and user-friendly; they are currently used in a wide variety of law enforcement, immigration, military, and civilian applications, including construction, manufacturing, testing, and inspection.”). For example, infrared night vision cameras are available for purchase on amazon.com for as little as \$50. See, e.g., *Camera, Photo, Video*, AMAZON.COM, http://www.amazon.com/Camera-Photo-Film-Canon-Sony/b/ref=sd_allcat_p?ie=UTF8&node=502394 (search “night vision camera”) (994 cameras available between \$25 and \$50 as of May 28, 2013).

³³⁷ For example, night goggles are available for purchase on amazon.com for as little as \$63. See, e.g., *Ultimate Arms Gear Military Binoculars*, AMAZON.COM, http://www.amazon.com/Ultimate-Arms-Gear-Military-Binoculars/dp/B004D5AUU8/ref=sr_1_3?s=electronics&ie=UTF8&qid=1362148739&sr=1-3&keywords=night+vision+b (last visited Mar. 1, 2013).

observe the home would be constitutional today? These infrared-based cameras would likely reveal many more “intimate details” inside the home, even as they passively captured that information from outside the home without any intrusion into it. It is inconceivable that the Court would allow this result given its appropriately forceful position of protecting the sanctuary of the home in reliance on the paramount intent of the framers of the Fourth Amendment.

The Court will simply have to retreat from its “general use” qualification and return to the principle that “*all* details [in the home] are intimate details, because the entire area is held safe from prying government eyes.”³³⁸ This is predictable since the *Kyllo* majority³³⁹ impliedly rejected other types of technological intrusions into the home, including “Handheld Ultrasound Through the Wall Surveillance,” and a ‘Radar Flashlight’ that . . . ‘detect[s] individuals through interior building walls.’³⁴⁰ The majority made it abundantly clear that it would not “leave the homeowner at the mercy of advancing technology . . . that could discern all human activity in the home.”³⁴¹ Indeed, it noted that “the rule we adopt must take account of more sophisticated systems that are already in use or in development.”³⁴² The logic of that analysis would seem to apply to all technological devices that detect information about the *interior* of the home.³⁴³

CONCLUSION

Technology has outpaced Fourth Amendment jurisprudence over the past fifty years. The judicial process moves much too slowly to keep up with the speed of technological innovation. In most cases, by the time the Supreme Court renders a decision on a particular technological device, that device is commonly used by everyone, has been replaced by newer technology, or has become obsolete. The infrared technology used by police in the *Kyllo* case provides a good example; today, it is commonly available in many cameras used by the public. As a result, that decision’s limiting

³³⁸ *Kyllo*, 533 U.S. at 37.

³³⁹ Four of the majority Justices are still on the Court today. *See supra* note 323.

³⁴⁰ *See Kyllo*, 533 U.S. at 36 n.3.

³⁴¹ *Id.* at 35-36.

³⁴² *Id.* at 36.

³⁴³ *See generally* 1 WAYNE R. LAFAVE, SEARCH AND SEIZURE § 2.2(c), at 425 (3d ed. 1996) (analyzing the use of binoculars, telescopes, and photo enlargement equipment).

principle restricting the use of technology “not generally available to the public” no longer serves as a meaningful limit on law enforcement.³⁴⁴ The Court will need to modify this approach to technology and may abandon it completely—especially with respect to surveillance of the interior of the home.

As a result of the Court’s inevitable lag behind technology, Fourth Amendment jurisprudence always remains two steps behind, making it difficult for law enforcement and society to know what rules apply to searches. The advent of the drone may be the “visceral jolt society needs to drag privacy law into the twenty-first century.”³⁴⁵ The American Civil Liberties Union (ACLU) has expressed concerns that pervasive drone surveillance would have “chilling effects” on the public’s behavior, and that abuses could lead to voyeurism, discriminatory targeting, and institutional abuse.³⁴⁶ On the other hand, the ACLU pointed out the usefulness of drones in “record[ing] the activities of officials, which can serve as a check on [government] power.”³⁴⁷

Law enforcement’s use of drones will potentially create unresolved issues for the next ten years or longer, until the proper case reaches the Supreme Court. Until then, lower courts will struggle to interpret the Court’s dicta in cases like *Jones* when applying the Fourth Amendment to drone surveillance. It would be best, as Justice Alito suggested in *Jones*, that Congress intercede by enacting appropriate legislation in the meantime.³⁴⁸

Drone surveillance also presents the danger of the accumulation or “mining” of this information by the government over the course of several years.³⁴⁹ Congress could provide a reasonable solution to this concern by imposing a time limit on the storage of this data if “there is no reasonable suspicion that the images contain evidence of criminal activity or are relevant to an ongoing investigation or pending criminal trial.”³⁵⁰ Another possible solution is to “minimiz[e] the collection . . . of information and data unrelated to the

³⁴⁴ See *supra* at notes 338-39.

³⁴⁵ See Calo, *supra* note 51, at 29.

³⁴⁶ See STANLEY & CRUMP, *supra* note 300, at 11-12.

³⁴⁷ *Id.* at 12-13.

³⁴⁸ United States v. Jones, 132 S. Ct. 945, 964 (2012) (Alito, J., concurring).

³⁴⁹ See *id.* at 957 (Sotomayor, J., concurring).

³⁵⁰ See *supra* note 310.

investigation of a crime.”³⁵¹ The Court could later use that statutory limitation to help identify “what society is prepared to recognize as reasonable” when applying *Katz*’s second prong to drone surveillance.

Until Congress acts, however, the Court should be able to continue protecting individual privacy from warrantless governmental drone surveillance by applying the reasonable expectation of privacy test, which will set the outer boundaries of permissible conduct under the Fourth Amendment. Under this analysis, the Court should prohibit surveillance of the interior of the home, limit monitoring of the curtilage to short intervals, and allow longer surveillance operations of perhaps one week of public places. Because drone surveillance would necessarily entail the use of photography and videotaping, the devices used should be limited to technology generally available to the public. Drawing such bright-line rules will provide a workable and predictable balance between the needs of law enforcement and the protection of individuals’ civil liberties. And the reasonable-expectation-of-privacy test may indeed survive another round.

³⁵¹ See Drone Aircraft Privacy and Transparency Act of 2012, H.R. 6676, 112th Cong. § 339(c)(1)(A) (recently proposed legislation by Massachusetts Democrat Representative Edward Markey). This is analogous to minimization requirements in wiretap warrants.