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Comments: Droning on about the Fourth Amendment: Adopting a Reasonable Fourth Amendment Jurisprudence to Prevent Unreasonable Searches by Unmanned Aircraft Systems

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DRONING ON ABOUT THE FOURTH AMENDMENT: ADOPTING A REASONABLE FOURTH AMENDMENT JURISPRUDENCE TO PREVENT UNREASONABLE SEARCHES BY UNMANNED AIRCRAFT SYSTEMS.

I. INTRODUCTION

With the introduction of new legislation in 2012, Congress set the stage for drones, or Unmanned Aircraft Systems (UAS), to become regular fixtures in United States' skies no later than 2015.[1] UAS platforms offer law enforcement agencies unprecedented tactical advantages in aerial surveillance based on their technological capabilities and affordable cost.[2] Nevertheless, the use of UAS raises many questions about their effect on personal privacy and what limitations there may be on their use.[3]

Historically, the Fourth Amendment to the United States Constitution has protected citizens' privacy rights against unreasonable government intrusion.[4] The Supreme Court has previously considered how Fourth Amendment protections apply to the government's use of manned aerial surveillance, sense-enhancing technologies, and electronic tracking devices.[5] However, the Court has never addressed anything with the technological capacity to threaten privacy to the extent that UAS can.[6]

This comment surveys current UAS developments and examines whether, and to what extent, the Fourth Amendment will protect privacy against the government's use of UAS. Part I provides an overview of the UAS market, uses, and technological capabilities, with an emphasis on law enforcement uses. Part II outlines the Supreme Court's Fourth Amendment jurisprudence, particularly addressing aerial surveillance, sense-enhancing technologies, and electronic tracking. Part III provides an analysis of how current

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1. *See infra* text accompanying notes 32–34.
2. *See infra* Part I.A–B.
3. *See infra* Part I.C.
4. *See* United States v. Jones, 132 S. Ct. 945, 950 (2012).
5. *Infra* Part II.
6. *See* Travis Dunlap, Comment, *We've Got Our Eyes on You: When Surveillance by Unmanned Aircraft Systems Constitutes a Fourth Amendment Search*, 51 S. TEX. L. REV. 173, 192–93 (2009).

jurisprudence might apply to a constitutional challenge to UAS surveillance, and examines the need for greater privacy protections.

Finally, Part IV argues for courts to adopt a new jurisprudence to prevent the erosion of privacy expectations in the face of advancing technology. Under the Court's current decisions, it is only a matter of time before UAS platforms erode Fourth Amendment protections. Further, the test for determining when a Fourth Amendment search occurs is fundamentally flawed. The government's use of UAS surveillance for law enforcement purposes should be presumptively considered a "search," which requires a warrant.

A. The Burgeoning Market for UAS

Although UAS are widely recognized for their military uses in overseas arenas like Pakistan and Afghanistan, they are beginning to be used domestically by federal, state, and local governments for a variety of purposes.[7] Customs and Border Patrol (CBP) has been operating Predator B UAS at the United States' border with Mexico to intercept drug smugglers and prevent unlawful crossings.[8] The CBP currently has a fleet of nine Predator B UAS which it estimates helped find 7,600 pounds of marijuana, valued at $19.3 million, being illegally smuggled into the United States in 2011.[9]

Local law enforcement agencies across the country are lining up to add UAS platforms to their arsenal of crime fighting capabilities.[10] For example, local police in the town of Lakota, North Dakota recently made the first UAS assisted arrest of an American citizen.[11] In that case, local police looking for six cows that had wandered onto the suspect's 3,000 acre ranch were chased off the land by the suspect and his family members who wielded high-powered rifles.[12] After a sixteen hour standoff, the police department's SWAT team used a

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7. RICHARD M. THOMPSON II, CONG. RESEARCH SERV., R42701, DRONES IN DOMESTIC SURVEILLANCE OPERATIONS: FOURTH AMENDMENT IMPLICATIONS AND LEGISLATIVE RESPONSES 2–3 (2013).
8. *See* Dunlap, *supra* note 6, at 180.
9. Brian Bennett, *Predator Drones Have Yet to Prove Their Worth on Border*, L.A. TIMES, Apr. 28, 2012, http://articles.latimes.com/2012/apr/28/nation/la-na-drone-bust-20120429.
10. *See* Courtney E. Walsh, *Surveillance Technology and the Loss of Something a Lot Like Privacy: An Examination of the "Mosaic Theory" and the Limits of the Fourth Amendment*, 24 ST. THOMAS L. REV. 169, 208 (2012).
11. Jason Koebler, *First Man Arrested with Drone Evidence Vows to Fight Case*, U.S. NEWS, Apr. 9, 2012, http://www.usnews.com/news/articles/2012/04/09/first-man-arrested-with-drone-evidence-vows-to-fight-case.
12. *Id.*

Department of Homeland Security (DHS) Predator drone with video surveillance equipment to determine the suspect's location and whether he was armed, prior to arresting him.[13]

Many other law enforcement agencies have acquired UAS and have pilot programs in place to test their surveillance capabilities.[14] Police in Oakland tested multiple UAS models and stated that they could be used to find local marijuana farms.[15] The Seattle Police Department has acquired and tested a UAS and envisions using it to take aerial photos of traffic accidents or provide real time video footage in situations where a suspect is barricaded with hostages or weapons.[16] Other agencies plan to use UAS technology in gaining a tactical advantage in everything from tracking drug dealers[17] to finding guns tossed away by fleeing suspects.[18]

Government agencies plan to use UAS surveillance for purposes beyond law enforcement.[19] DHS has tested UAS capabilities for fighting fires, detecting nuclear radiation, and responding to environmental disasters such as earthquakes or hazardous chemical spills.[20] Other potential UAS applications which have been identified include finding missing persons in difficult terrain, surveying crops, and monitoring pipelines and power lines.[21]

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13. *Id.* Upon being interviewed about the UAS use, one Brookings Institute expert on information gathering and drone use prophetically declared that "[i]t may have been the first time a drone was used to make an arrest, but it's certainly not going to be the last." *Id.*
14. *See* Walsh, *supra* note 10, at 208 (citing programs operated by the Los Angeles County Sheriff's Department, the Miami-Dade Metro Police, the Houston Police Department, and the Sacramento Police Department).
15. *Warnings of Domestic Spying as Oakland Police Seek Drones*, COMMON DREAMS, Oct. 19, 2012, http://www.commondreams.org/headline/2012/10/19-5.
16. Christine Clarridge, *Police Department Demonstrates New Drone, to Help Allay Concerns*, SEATTLE TIMES, Apr. 27, 2012, http:// seattletimes.com/html/localnews/2018090173_drones28m.html.
17. 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.
18. Brian Bennett, *Drones Tested as Tools for Police and Firefighters*, L.A. TIMES, Aug. 5, 2012, http://articles.latimes.com/2012/aug/05/nation/la-na-drones-testing-20120805.
19. *See id.*
20. *Id.*
21. Gary Martin & Viveca Novak, *Push to Step Up Domestic Use of Drones*, S.F. GATE, Nov. 27, 2012, http://www.sfgate.com/nation/article/Push-to-step-up-domestic-use-of-drones-4064482.php#page-1.

Not only is the public market for UAS technology expanding, but the private commercial industry is growing rapidly as well.[22] Some real estate agents hire photographers using UAS to make aerial movies of luxury properties using high-definition video.[23] A farmer in Louisiana recently used a UAS with a heat-sensing camera to hunt for feral pigs at night, while other farmers have used them to spot irrigation leaks.[24] UAS may even be used to shoot Hollywood films.[25] One UAS is widely available and affordable to the general public, as it costs approximately $300 and is controlled from an iPhone or iPad.[26]

The overall market for UAS is expected to grow considerably in the near future.[27] Improving technology, coupled with decreases in acquisition and operating costs, make UAS relatively more affordable as aerial surveillance platforms than manned aircraft.[28] For example, the cost of a new helicopter is prohibitively high for most police departments with a price tag of $1 million, but UAS can be purchased for less than $50,000.[29] Industry analysts predict that the global market for UAS will nearly double from $6.6 billion to $11.4 billion in the next decade, with the United States accounting for $2.4 billion.[30] In fact, the Federal Aviation Administration (FAA) has

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22. *See* Nick Wingfield & Somini Sengupta, *Drones Set Sights on U.S. Skies*, N.Y. TIMES, Feb. 17, 2012, http://www.nytimes.com/2012/02/18/technology/drones-with-an-eye-on-the-public-cleared-to-fly.html?pagewanted=all_r=0.
23. *Id.*
24. *Id.*
25. *Id.*
26. *See* Benjamin Fearnow, *Domestic Spying: Mini-Drone Can Watch Neighbors from Above*, CBS, Aug. 10, 2012, http:// washington.cbslocal.com/2012/08/10/domestic-spying-mini-drone-can-watch-neighbors-from-above/.
27. Through groups like the Association for Unmanned Vehicle Systems International (AUVSI), the UAS industry has spent a great deal of time and money lobbying U.S. lawmakers about the need for and uses of drones. *See* Martin & Novak, *supra* note 21.
28. *See* Paul McBride, Comment, *Beyond Orwell: The Application of Unmanned Aircraft Systems in Domestic Surveillance Operations*, 74 J. AIR L. & COM. 627, 638 (2009).
29. Peter Finn, *Domestic Use of Aerial Drones by Law Enforcement Likely to Prompt Privacy Debate*, WASH. POST, Jan. 23, 2011, http://www.washingtonpost.com/wp-dyn/content/article/2011/01/22/AR2011012204111.html. According to one estimate by law enforcement officials, the cost to fly a drone is $3.80 per hour, compared to $6,000 per hour for a helicopter. Gary Mortimer, *Shelby County Sheriff Wants 2 Drone Helicopters*, sUAS NEWS, May 6, 2012, http://www.suasnews.com/2012/05/15382/shelby-county-sheriff-wants-2-drone-helicopters/.
30. Martin & Novak, *supra* note 21.

estimated that in less than twenty years there could be 30,000 unmanned aircraft flying in U.S. skies.[31]

Until recently, FAA safety restrictions have kept most UAS grounded and restrained their presence in national airspace.[32] This changed when Congress passed the FAA Modernization and Reform Act of 2012, which requires the FAA to "develop a comprehensive plan to safely accelerate the integration of civil unmanned aircraft systems into the national airspace system."[33] According to the plan, UAS must be integrated by September 2015.[34] However, law enforcement agencies are currently allowed to operate UAS for aerial surveillance, provided they meet certain requirements.[35]

B. UAS Technology

The technological capabilities of UAS are diverse, extremely advanced, and progressing rapidly.[36] Some models are as small as insects, while others are as large as conventional jets.[37] The Predator B, utilized by the police in North Dakota, is a large, fixed wing aircraft with a wingspan of sixty-six feet, can reach an altitude of 50,000 feet, and can stay aloft for thirty hours.[38] By contrast, the Nano Hummingbird, developed by the Pentagon to look and fly like an actual hummingbird, has a wingspan of approximately 6.5 inches, can fly at speeds up to eleven miles per hour, and weighs only nineteen grams, which is less than a AA battery.[39]

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31. THOMPSON, *supra* note 7, at 2.
32. Bennett, *supra* note 18.
33. FAA Modernization and Reform Act of 2012, Pub. L. No. 112–95, § 332, 126 Stat. 11, 73.
34. *Id.*
35. For example, government agencies can currently operate UAS as long as they weigh 4.4 pounds or less, fly no higher than 400 feet, are flown during daylight, and remain within the operator's sight. *Id.* § 334, 126 Stat. at 76–77.
36. *See infra* Part I.B.
37. THOMPSON, *supra* note 7, at 2.
38. JAY STANLEY & CATHERINE CRUMP, ACLU, PROTECTING PRIVACY FROM AERIAL SURVEILLANCE: RECOMMENDATIONS FOR GOVERNMENT USE OF DRONE AIRCRAFT 2 (2011), *available at* http://www.aclu.org/files/assets/ protectingprivacyfromaerialsurveillance.pdf; 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.
39. W.J. Hennigan, *It's a Bird! It's a Spy! It's Both*, L.A. TIMES, Feb. 17, 2011, http://articles.latimes.com/2011/feb/17 /business/la-fi-hummingbird-drone-20110217. In two years' time the developer of the Nano Hummingbird successfully increased its flight time from twenty seconds to over eight minutes. *Id.*

Given the prohibitive cost of purchasing and operating UAS like the Predator B, most models that are currently being tested and operated by local law enforcement agencies are much smaller than the Predator B.[40] The Seattle Police Department operates the Draganflyer X6, a helicopter-like UAS that weighs 3.5 pounds, can carry up to thirty-five ounces, and has a battery life of close to ten minutes.[41] The Draganflyer can be equipped with digital cameras capable of taking still shots or video, or infrared cameras that can be viewed live.[42] It can hover in place or reach speeds up to thirty miles per hour, and is relatively affordable with a purchase price of $41,000.[43]

The Miami-Dade Police Department employs a UAS with similar technological capabilities.[44] The T-Hawk Micro Air Vehicle (MAV) designed by Honeywell, weighs approximately eighteen pounds, can reach an altitude of 9,000 feet, and cost the department $50,000.[45] The MAV is advertised as operational in all weather conditions, day and night, and boasts a "hover-and-stare capability."[46] Given its small size, the MAV is designed to fit in a backpack, and can be deployed and operated from a vehicle.[47] Like the Draganflyer X6, the T-Hawk MAV carries both electronic and infrared cameras.[48]

Surveillance technologies employed by UAS are highly sophisticated and constantly evolving.[49] Infrared cameras can see

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40. With a purchase price of $4.3 million, the Predator B costs at least twice that of the average manned helicopter used in civil aviation and costs an additional $7–$8 million annually to operate. Walsh, *supra* note 10, at 209–10.
41. Clarridge, *supra* note 16.
42. *Id.*
43. *Id.*; *Draganflyer X6 Helicopter Tech Specs*, DRAGANFLY.COM, http://www.draganfly.com/uav-helicopter/draganflyer-x6/specifications/ (last visited Nov. 9, 2013).
44. *See* Tim Elfrink, *Miami-Dade Police Drones Are Ready for Action*, MIAMI NEW TIMES, Nov. 17, 2011, http://www.miaminewtimes.com/2011-11-17/news/miami-dade-police-drones-are-ready-for-action/.
45. *See id.*
46. *T-Hawk*, HONEYWELL AEROSPACE, July 5, 2012, http://aerospace.honeywell.com/thawk.
47. *See id.* The T-Hawk is designed to enable its operator to assemble it and have it airborne within ten minutes. *Id.*
48. *See T-Hawk: Unmanned Micro Air Vehicle*, HONEYWELL, http://www51.honeywell.com/aero/common/documents/myaerospacecatalog-documents/Defense_Brochures-documents/T-Hawk_Unmaned_Micro_Air_Vehicle.pdf (last visited Nov. 9, 2013) [hereinafter *Unmanned Micro Air Vehicle*].
49. *See, e.g.*, *DraganFlyer X6 Thermal Infrared Camera*, DRAGANFLY INNOVATIONS INC.,

objects through walls based on their relative thermal signature and can locate individuals based on their body heat.[50] UAS are regularly outfitted with high-powered cameras capable of providing law enforcement with real-time video or still shots.[51] They can also be equipped with laser radar (LADAR), which can produce three-dimensional images and is able to "see through trees and foliage."[52]

UAS can be outfitted with automated license plate readers that enable law enforcement to recognize and track vehicles based on their license plate numbers.[53] The U.S. Army is currently developing facial recognition software which could eventually provide law enforcement agencies with the capacity to track individuals, even in a crowd, based on their appearance.[54] Further, the development of "soft biometric" recognition could equip UAS with technology to identify and track individuals using personal attributes such as age, gender, skin color, height, and weight.[55]

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http://www.draganfly.com/uav-helicopter/draganflyer-x6/features/flir-camera.php (last visited Nov. 9, 2013) [hereinafter *Thermal Infrared Camera*] (describing a UAS outfitted with a thermal infrared camera); *DraganFlyer X6 Wireless Video System*, DRAGANFLY INNOVATIONS INC., http://www.draganfly.com/uav-helicopter/draganflyer-x6/features/wireless-video-system.php (last visited Nov. 9, 2013) [hereinafter *Wireless Video* System] (describing a UAS with the ability to take real-time video); LK, *Unmanned Aerial Vehicles Support Border Security*, CUSTOMS AND BORDER PROTECTION TODAY, July-Aug. 2004, *available at* http://www.cbp.gov/xp/CustomsToday/2004/Aug/other/aerial_vehicles.xml [hereinafter *Unmanned Aerial Vehicles Support Border Security*] (describing UAS with the ability to read license plates); Noah Shachtman, *Army Tracking Plan: Drones that Never Forget a Face*, WIRED, Sept. 28, 2011, http://www.wired.com/dangerroom/2011/09/drones-never-forget-a-face/ (describing the advancement of facial recognition software on UAS).

50. *See* THOMPSON, *supra* note 7, at 3 n.22; *Thermal Infrared Camera*, *supra* note 49.

51. *See Wireless Video System*, *supra* note 49. The U.S. Army recently deployed three Boeing A160 Hummingbird Drones to Afghanistan outfitted with a 1.8 gigapixel camera capable of monitoring up to sixty-five independent targets simultaneously from an altitude of 20,000 feet. *See* Andrew Munchbach, *US Army's A160 Hummingbird Drone-Copter to Don 1.8 Gigapixel Camera*, ENGADGET, (Dec. 27, 2011, 11:34 PM), http://www.engadget.com/2011/12/27/us-armys-a160-hummingbird-drone-copter-to-don-1-8-gigapixel-cam/.

52. THOMPSON, *supra* note 7, at 3–4 n.24.

53. *See Unmanned Aerial Vehicles Support Border Security*, *supra* note 49.

54. *See* Shachtman, *supra* note 49.

55. *Id.*

Because of their small size, many UAS are less detectable than traditional forms of aerial surveillance, such as helicopters.[56] Their stealth qualities are also enhanced by the fact that they are much quieter.[57] The SkySeer model tested by the Los Angeles County Sheriff's Department (LASD) is "as loud as a mosquito buzzing" at twenty feet, and is completely undetectable at greater distances.[58]

Despite most current UAS models facing limited flight times due to the need to recharge their batteries,[59] new technologies are being developed to overcome this limitation.[60] For instance, some developers are outfitting UAS with solar panels to extend the duration of flight times.[61] Lockheed Martin has extended the flight time of the Stalker, a small, electrically-powered UAS, to over forty-eight hours by successfully recharging its battery from the ground using a laser.[62] It is conceivable that the development of these technologies could ultimately allow UAS models, at least theoretically, to "stay in the air forever."[63]

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56. *See* Daniel B. Wood, *It's a Kite. It's a Model Airplane. It's . . . the Sheriff!*, CHRISTIAN SCI. MONITOR, July 11, 2006, http://www.csmonitor.com/2006/0711/p01s01-usju.html.
57. *See id.*
58. *See id.* For more information on the specifications of the Skyseer, *see* EVAN BALDWIN CARR, NAT'L CENTER FOR POLICY ANALYSIS, UNMANNED AERIAL VEHICLES: EXAMINING THE SAFETY, SECURITY, PRIVACY AND REGULATORY ISSUES OF INTEGRATION INTO U.S. AIRSPACE, app. II (2013), *available at* http://www.ncpa.org/pdfs/sp-Drones-long-paper.pdf.
59. The Draganflyer X6 has an estimated battery life of approximately ten minutes, the T-Hawk MAV fifty minutes, and the SkySeer fifty minutes. *See* CARR, *supra* note 58, at app. II; *Unmanned Micro Air Vehicle*, *supra* note 48; *supra* Part I.B.
60. *See* Mark Brown, *Lockheed Uses Ground-Based Laser to Recharge Drone Mid-Flight*, WIRED, July 12, 2012, http://www.wired.co.uk/news/archive/2012-07/12/lockheed-lasers (stating how one UAS is using a land-bound laser to recharge UAS mid-flight); *Silent Falcon*, SILENT FALCON UAS TECHNOLOGIES, http://www.silentfalconuas.com/Silent_Falcon_spec_sheet.pdf (last visited July 12, 2013) (showing how one UAS is using solar power to stay in the air longer).
61. *See, e.g.*, SILENT FALCON UAS TECHNOLOGIES, *supra* note 60. Depending on the battery size, the Silent Falcon can remain airborne for between six and fourteen hours. *See id.*
62. Brown, *supra* note 60.
63. *Id.*

C. Privacy Concerns

The advent of the widespread government use of UAS has raised concerns about the potential threat to Americans' privacy.[64] Critics warn of a surveillance society in which the government monitors, tracks, records, and scrutinizes individuals' every move.[65] Individuals have expressed sentiments such as, "I do not want flying spy robots looking into my private property with infrared cameras . . . It's an invasion of my privacy."[66] Survey results indicate that the American public is opposed to using UAS in routine police matters.[67]

Public opposition to drone use has had some effect. In response to public backlash, the Seattle Police Department recently returned its two UAS to the manufacturer after the mayor banned their use.[68] Virginia's legislature has imposed a two-year moratorium on using UAS for criminal investigations.[69] Similarly, Congress has introduced legislation that would establish limitations on law enforcement's use of UAS platforms.[70]

Although privacy concerns can be addressed by Congress[71] or state legislatures, the constitutionality of law enforcement's use of UAS for aerial surveillance will ultimately be determined by the courts.[72] The issue to be resolved is whether domestic UAS use is lawful under the Fourth Amendment.[73] The remainder of this comment will analyze the government's use of UAS for aerial surveillance under

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64. *See generally* STANLEY & CRUMP, *supra* note 38, at 10–13 (discussing the potential for UAS surveillance to be used for discriminatory targeting, voyeurism, and institutional abuse).
65. *Id.* at 1.
66. Jonathan Kaminsky, *Seattle Police Plan for Helicopter Drones Hits Severe Turbulence*, REUTERS (Nov. 27, 2012, 12:54 PM), http://www.reuters.com/article/2012/11/27/us-usa-drones-seattle-idUSBRE8AQ10R20121127.
67. *See U.S. Supports Some Domestic Drone Use*, MONMOUTH UNIV., (June 12, 2012), http://www.monmouth.edu/assets/0/84/159/2147483694/3b904214-b247-4c28-a5a7-cf3ee1f0261c.pdf.
68. Somini Sengupta, *Rise of Drones in U.S. Drives Effort to Limit Police Use*, N.Y. TIMES, Feb. 15, 2013, http://www.nytimes.com/2013/02/16/technology/rise-of-drones-in-us-spurs-efforts-to-limit-uses.html.
69. *Id.*
70. *Id.*
71. Multiple representatives have already introduced legislation that would proscribe constraints on law enforcement's use of UAS. *See* THOMPSON, *supra* note 7, at 18–20.
72. McBride, *supra* note 28, at 638–39.
73. *See* THOMPSON, *supra* note 7, at 4.

the Fourth Amendment and argue for a jurisprudence that will maximize protections for individual privacy rights.

II. CURRENT FOURTH AMENDMENT JURISPRUDENCE

The Fourth Amendment protects people against unreasonable searches and seizures and guarantees their right to "be secure in their persons, houses, papers, and effects."[74] It further requires that police obtain a warrant supported by probable cause prior to executing a search.[75] When the police violate the Fourth Amendment by unlawfully conducting a search without a warrant supported by probable cause, any evidence obtained as a result of that search is excluded from admission against the victim in any subsequent criminal trial.[76]

The Supreme Court has declared that when a "search" within the meaning of the Fourth Amendment occurs, it is "presumptively unreasonable without a warrant."[77] However, when there is no search, no warrant is required.[78] Therefore the threshold question for determining whether police need a warrant to conduct aerial surveillance with UAS is whether or not the surveillance constitutes a search, triggering Fourth Amendment protections.[79]

A. Original Trespass Doctrine and the Reasonable Expectation of Privacy Test under Katz

Prior to the latter half of the twentieth century, the Supreme Court took a property-based approach to its Fourth Amendment jurisprudence based on common-law trespass, as demonstrated in *Olmstead v. United States*.[80] In *Olmstead*, the defendants were convicted of selling liquor unlawfully after federal prohibition agents installed wiretapping devices on the public telephone lines from their residences and intercepted their telephone calls.[81] The petitioners

74. U.S. CONST. amend. IV.
75. *Id.*
76. *See* Mapp v. Ohio, 367 U.S. 643, 655 (1961) (expanding the exclusionary rule from federal cases to state cases).
77. Kyllo v. United States, 533 U.S. 27, 40 (2001).
78. *See* California v. Ciraolo, 476 U.S. 207, 215 (1986) (holding that no search had occurred where police observed the curtilage of the home from public airspace, and therefore no warrant was required).
79. Dunlap, *supra* note 6, at 184.
80. 277 U.S. 438 (1928), *overruled by* Katz v. United States, 389 U.S. 347 (1967), *and* Berger v. New York, 388 U.S. 41 (1967).
81. *Id.* at 456-57.

contended that the wiretapping amounted to a search in violation of the Fourth Amendment.[82]

In delivering the opinion of the Court, Chief Justice Taft rejected the petitioner's claim and held that the Fourth Amendment had not been violated because no search had occurred.[83] The reason for this conclusion was that the agents did not trespass on the petitioner's property when they installed the wiretaps.[84] In his view, there could be no Fourth Amendment violation "unless there has been an official search and seizure of his person or such a seizure of his papers or his tangible material effects or an actual physical invasion of his house 'or curtilage' . . . ."[85]

Chief Justice Taft narrowly construed the rights provided by the Fourth Amendment to the right to exclude others from physically intruding on the interior of the home and its immediate surroundings.[86] Provided there is no trespass into those areas, one who uses a telephone "intends to project his voice to those quite outside," so the communication is not protected by the Fourth Amendment.[87] The trespass rule from *Olmstead* continued until the Court's decision in *Katz v. United States* almost four decades later.[88]

In *Katz*, the Supreme Court dramatically altered the conception of the Fourth Amendment by extending its protections beyond places to individual privacy.[89] In *Katz*, the defendant was convicted by the lower court of transmitting illegal gambling information via telephone.[90] FBI agents, presumably under the protection of *Olmstead*, attached an electronic listening and recording device to the exterior of a public telephone booth used by the defendant to place his calls.[91] The Court of Appeals held that no violation of the Fourth Amendment had occurred because the recordings were obtained without any physical trespass into the interior of the phone booth.[92]

On appeal, the Supreme Court characterized the parties' arguments over whether the phone booth was a "constitutionally protected area,"

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82. *Id.* at 455.
83. *Id.* at 464.
84. *Id.* at 457.
85. *Id.* at 466.
86. *See Olmstead*, 277 U.S. at 466.
87. *Id.*
88. Walsh, *supra* note 10, at 178.
89. *See* Katz v. United States, 389 U.S. 347 (1967).
90. *Id.* at 348.
91. *See id.*
92. *Id.* at 348–49.

or whether there had been a trespass, as misguided.[93] The Court rejected the idea that the government's right to search and seize is based on property law and discarded the trespass-based test from *Olmstead*.[94] Instead, the Court asserted that "the Fourth Amendment protects people, not places,"[95] and therefore "[t]he fact that the electronic device employed . . . did not . . . penetrate the wall of the booth can have no constitutional significance."[96]

In its analysis, the Court focused on Katz's expectation of privacy and stated that when Katz occupied the telephone booth, "shut[] the door behind him, and pa[id] the toll" he was "surely entitled to assume that the words he utter[ed] into the mouthpiece [would] not be broadcast to the world."[97] Because electronically recording Katz's conversations violated his reasonable expectation of privacy, the Government's actions constituted a Fourth Amendment search.[98]

The staying power of *Katz* is the concurring opinion written by Justice Harlan that established the current test applied by courts to determine if a Fourth Amendment search has occurred. Individuals have a "reasonable expectation of privacy" that is "constitutionally protected."[99] According to Justice Harlan's two-prong test, a search occurs when police intrude in an area where an individual: (1) "ha[s] exhibited an actual (subjective) expectation of privacy," and (2) "the expectation be one that society is prepared to recognize as 'reasonable.'"[100]

Furthermore, Justice Harlan made a distinction between the expectation of privacy that an individual has in his home which is "a place where he expects privacy" and outside the home where "objects, activities, or statements that he exposes to the 'plain view' of outsiders are not 'protected' because no intention to keep them to himself has been exhibited."[101] This distinction would prove to be influential in the Court's later decisions reviewing the

93. *Id.* at 350.
94. *Id.* at 353.
95. *Katz*, 389 U.S. at 351.
96. *Id.* at 353.
97. *Id.* at 352. Although the Court recognized that there may be constitutional protection for things an individual attempts to keep private, even in a public place, it stated that "What a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection." *Id.* at 351.
98. *Id.* at 353. Justice Harlan noted that a public telephone booth is "a temporarily private place whose momentary occupants' expectations of freedom from intrusion are recognized as reasonable." *Id.* at 361 (Harlan, J., concurring).
99. *Id.* at 360.
100. *Katz*, 389 U.S. at 361.
101. *Id.*

constitutionality of police use of aerial surveillance, sense-enhancing technology, and electronic tracking devices.[102]

B. Aerial Surveillance and the Fourth Amendment

The Supreme Court has considered whether aerial surveillance constitutes a search under the Fourth Amendment in three separate cases, each time determining under the *Katz* test that there was no expectation of privacy that society recognized as reasonable.[103] In *California v. Ciraolo*, the police received a tip that an individual was growing marijuana in his backyard.[104] Because two fences blocked the officers' view of the yard from the ground level, they secured an airplane and flew over the property at an altitude of 1,000 feet.[105] From their vantage point, officers identified marijuana plants growing in the yard with the naked eye.[106]

The Supreme Court acknowledged that the backyard was within the curtilage of the home,[107] but asserted "[t]hat the area is within the curtilage does not itself bar all police observation."[108] Applying the first prong of the *Katz* test, the Court found that the respondent demonstrated a subjective expectation of privacy by erecting fences that obstructed a ground-level view of the backyard.[109] Nevertheless, the Court held that the respondent's claimed expectation of privacy in the area immediately adjacent to his home was not one that society would recognize as reasonable.[110]

The Court emphasized the fact that the officers observed the marijuana plants from publicly navigable airspace.[111] Borrowing language from *Katz*, the Court asserted that "[w]hat a person knowingly exposes to the public . . . is not a subject of Fourth Amendment protection."[112] Because any member of the general

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102. *See infra* Part II.B–D.
103. McBride, *supra* note 28, at 642.
104. California v. Ciraolo, 476 U.S. 207, 209 (1986).
105. *Id.*
106. *Id.*
107. *Id.* at 213. The Supreme Court has identified curtilage as "the area to which extends the intimate activity associated with the 'sanctity of a man's home and the privacies of life.'" *Id.* at 212 (quoting Oliver v. United States, 466 U.S. 170, 180 (1984)). The factors that the Court considered determinative here were that the area in question was immediately adjacent to the home and enclosed by fences. *Id.* at 213.
108. *Id.*
109. *Id.* at 211.
110. *Ciraolo*, 476 U.S. at 214.
111. *Id.* at 213.
112. *Id.* (quoting Katz v. United States, 389 U.S. 347, 351 (1967)).

public flying in the same airspace could have made the same observation as the police, the respondent knowingly exposed his backyard to the public and could not reasonably expect freedom from aerial surveillance.[113] In the Court's opinion, "[t]he Fourth Amendment simply does not require the police traveling in the public airways at this altitude to obtain a warrant in order to observe what is visible to the naked eye."[114]

Similarly, in *Florida v. Riley*, local police received a tip that the respondent was growing marijuana in a greenhouse on his property.[115] When the police were unable to view the contents of the greenhouse from the road, they flew a helicopter 400 feet over the property.[116] With his naked eye, one of the officers observed marijuana plants through openings in the greenhouse roof.[117] As in *Ciraolo*, the Court found it determinative that the helicopter was lawfully in navigable airspace, where any member of the public could have flown.[118] On this basis, the Court held that the helicopter surveillance was not a Fourth Amendment search for which a warrant was required.[119]

Unlike *Ciraolo* and *Riley*, which involved areas immediately adjacent to private homes, in *Dow Chemical Co. v. United States* the Court addressed aerial surveillance of a 2,000 acre industrial complex.[120] After being denied access to the complex, the Environmental Protection Agency (EPA) hired a commercial aerial photographer to take photographs of the facility from various altitudes within navigable airspace using a precision aerial mapping camera.[121] The petitioner, Dow Chemical Co., claimed that taking the photographs constituted a warrantless search in violation of the Fourth Amendment.[122]

Dow argued that the exposed areas of the industrial complex constituted an "industrial curtilage" that should have the same constitutional protection as the curtilage of private homes, and that the level of sense-enhancement from the photographs was

113. *Id.* at 213–14.
114. *Id.* at 215.
115. 488 U.S. 445, 448 (1989).
116. *Id.*
117. *Id.*
118. *See id.* at 451; *Ciraolo*, 476 U.S. at 207, 213.
119. *Riley*, 488 U.S. at 452.
120. *See id.* at 445; *Ciraolo*, 476 U.S. at 224; Dow Chem. Co. v. United States, 476 U.S. 227, 229 (1986).
121. *Dow Chem. Co.*, 476 U.S. at 229.
122. *Id.* at 234.

impermissible.[123] In rejecting Dow's first argument, the Court concluded that "open areas of a complex industrial plant . . . are not analogous to the 'curtilage' of a dwelling for purposes of aerial surveillance."[124]

The Court identified curtilage as the area immediately surrounding private homes where occupants have a reasonable expectation of privacy that society recognizes as reasonable.[125] The Court distinguished the area in question from curtilage as more analogous to open fields where "an individual has no legitimate expectation that open fields will remain free from warrantless intrusion by government officers."[126]

Further, the Court disagreed that that the level of enhancement the camera provided violated Dow's constitutional rights.[127] However, the Court indicated that the use of technology could implicate the Fourth Amendment, acknowledging that "using highly sophisticated surveillance equipment not generally available to the public, such as satellite technology, might be constitutionally proscribed absent a warrant."[128] Because "the photographs here are not so revealing of intimate details as to raise constitutional concerns,"[129] the Court ultimately held that taking photographs of an industrial complex from navigable airspace without a warrant is not a prohibited Fourth Amendment search.[130]

C. Sense-Enhancing Technologies and Kyllo

In *Kyllo v. United States*, the Supreme Court revisited the issue from *Dow Chemical*, of the constitutional limitations on the Government's use of sophisticated, sense-enhancing technology.[131] Government agents suspected that Danny Kyllo was growing marijuana in his home.[132] Because indoor marijuana growth often

123. *Id.* at 235.
124. *Id.* at 239.
125. *Id.* at 235. In its analysis, the Court stated that "We find it important that this is *not* an area immediately adjacent to a private home, where privacy expectations are most heightened." *Id.* at 237 n.4.
126. Oliver v. United States, 466 U.S. 170, 180–81 (1984).
127. *See Dow Chem. Co.*, 476 U.S. at 238.
128. *Id.*
129. *Id.*
130. *Id.* at 239.
131. *See generally* Kyllo v. United States, 533 U.S. 27 (2001) (explaining that the more sophisticated the technology is, the less likely the search is permissible without a warrant).
132. *Id.* at 29.

requires the use of heat generating lamps, the agents scanned Kyllo's home with a thermal imager to detect infrared radiation.[133] The results of the scan showed that the roof over the garage and a side wall of the home were warmer than the rest of the home.[134] Using the information from the scan, tips from informants, and utility bills to secure a search warrant, the agents discovered more than 100 marijuana plants inside the home.[135]

In speaking for the Court, Justice Scalia addressed the impact of technology on privacy stating that "[i]t 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."[136] One example noted by the Court was how the technology of flight had exposed areas of the house and curtilage that had formerly been private.[137] For Justice Scalia, the key question the Court needed to answer was "what limits there are upon this power of technology to shrink the realm of guaranteed privacy."[138]

In the opinion of the Court, a bright-line rule needed to be drawn at the entrance to the home.[139] Justice Scalia declared the Court's rule that "obtaining by sense-enhancing technology any information regarding the interior of the home that could not otherwise have been obtained without physical 'intrusion into a constitutionally protected area' constitutes a search—at least where (as here) the technology in question is not in general public use."[140] Considering the information obtained with the thermal imager could not have been obtained without entering the home, the scan constituted an unlawful search in violation of the Fourth Amendment.[141]

D. Electronic Tracking Devices, GPS Devices, and the Fourth Amendment

In the first of three cases involving electronic tracking devices, the Supreme Court decided whether police violated the defendant's Fourth Amendment rights when they used a beeper to monitor the

133. *Id.*
134. *Id.* at 30.
135. *Id.*
136. *Id.* at 33–34.
137. *Kyllo*, 533 U.S. at 34 (citing California v. Ciraolo, 476 U.S. 207, 215 (1986)).
138. *Id.*
139. *Id.* at 40.
140. *Id.* at 34 (quoting Silverman v. United States, 365 U.S. 505, 512 (1961)).
141. *Id.* at 40.

movements of his car.[142] In *Knotts v. United States*, a chemical company notified the local police that an employee, Tristan Armstrong, had been stealing chemicals used to produce illegal drugs.[143] Narcotics officers then obtained permission from another chemical company to place a beeper inside a five-gallon drum of chloroform that would be purchased by Armstrong.[144] After Armstrong made the purchase, the police followed his car by maintaining visual contact and using a monitoring device that received signals sent from the beeper.[145]

Officers continued to follow Armstrong when he transferred the drum to a co-conspirator, Darryl Petschen.[146] Although the police ended their visual surveillance of Petschen for a time, they were able to track him to a remote cabin following the signal from the beeper.[147] Using information from the beeper and visual surveillance of the cabin, police secured a search warrant.[148] Upon execution of the warrant, the police discovered a clandestine drug laboratory used to produce amphetamines.[149]

In applying the *Katz* test, the Court noted its own precedent for finding a reduced expectation of privacy in motor vehicles[150] and held that "[a] person travelling in an automobile on public thoroughfares has no reasonable expectation of privacy in his movements from one place to another."[151] By traveling on public streets, Petschen voluntarily conveyed his direction, stops, and final destination to the general public.[152] Thus, the police could have obtained the same information conveyed by the beeper by conducting traditional visual

142. *See* United States v. Knotts, 460 U.S. 276, 277 (1983); *see also* United States v. Jones, 132 S. Ct. 945, 952 (2012); United States v. Karo, 468 U.S. 705, 714 (1984).
143. *Knotts*, 460 U.S. at 278.
144. *Id.*
145. *Id.*
146. *Id.*
147. *Id.*
148. *Id.* at 279.
149. *Knotts*, 460 U.S. at 279.
150. The Court identified the reasons for the reduced expectation of privacy as the automobile's function for transportation rather than dwelling, and its openness, which places both its occupants and contents in plain view. *Id.* at 281 (citing Cardwell v. Lewis, 417 U.S. 583, 590 (1974)).
151. *Id.*
152. *Id.* at 281–82.

surveillance.[153] Therefore, monitoring the beeper did not constitute a search within the meaning of the Fourth Amendment.[154]

In its analysis, the Court addressed the issue of police use of sense-enhancing technology.[155] Without discussing limitations, the Court endorsed its use in the context of *Knotts*, stating that "[n]othing in the Fourth Amendment prohibited the police from augmenting the sensory faculties bestowed upon them at birth with such enhancement as science and technology afforded them in this case."[156] Further, the Court categorically rejected the idea that the police should not be allowed to use electronic surveillance to their advantage as "[w]e have never equated police efficiency with unconstitutionality, and we decline to do so now."[157]

In his brief, Knotts raised the issue of long-term dragnet surveillance, claiming that if the Court found no Fourth Amendment search had occurred, then "twenty-four hour surveillance of any citizen of this country will be possible, without judicial knowledge or supervision."[158] The Court did not reach the issue, noting that "if such dragnet-type law practices as respondent envisions should eventually occur, there will be time enough then to determine whether different constitutional principles may be applicable."[159]

One year later the Supreme Court shed some light on the limitations on the use of sense-enhancing technology in its next case addressing a tracking beeper.[160] In *United States v. Karo*, police obtained permission from an informant to install and monitor a beeper in a can of ether that the police believed would eventually be used to manufacture cocaine.[161] Using visual and beeper surveillance, the police followed the can as it was moved to several houses and ultimately to a storage facility.[162]

In the view of the Court, the critical fact was that the beeper informed police of the location of the can inside the suspect's home,

153. *Id.* at 282.
154. *Id.* at 285.
155. *See Knotts*, 460 U.S. at 282.
156. *Id.*
157. *Id.* at 284.
158. Brief for Respondent at 9, United States v. Knotts, 460 U.S. 276 (1983) (No. 81-1802).
159. *Knotts*, 460 U.S. at 284.
160. *See* United States v. Karo, 468 U.S. 705, 714 (1984) (holding that the monitoring of a beeper in a private residence violated the Fourth Amendment).
161. *Id.* at 708.
162. *Id.*

an area "not open to visual surveillance."[163] Unlike *Knotts*, where the beeper revealed nothing about the interior of the cabin, the Court noted that the use of a beeper here "reveal[s] a critical fact about the interior of the premises that the Government . . . could not have otherwise obtained without a warrant."[164] Because individuals maintain a reasonable expectation of privacy in their homes, the Court held that a Fourth Amendment search had occurred.[165]

After *Knotts* and *Karo*, it was clear that monitoring a beeper in transit on public streets and outside of private residences does not constitute a search but that monitoring a location where there is a reasonable expectation of privacy, such as a home, is a search that requires a warrant.[166] Thereafter, police had to decide whether to acquire a warrant prior to using a beeper to monitor suspects or risk warrantless tracking, although any evidence obtained in areas where there is a reasonable expectation of privacy could be suppressed.[167]

Last year, in *United States v. Jones*, the Supreme Court had the opportunity to conclusively decide the unresolved issue from *Knotts*: whether the government's long term use of electronic monitoring to track a vehicle's public movements constitutes a Fourth Amendment search for which a warrant is required.[168] Instead, the Supreme Court revived the trespass doctrine from *Olmstead* and added a new wrinkle to Fourth Amendment jurisprudence pertaining to electronic surveillance.[169]

In *Jones*, law enforcement officers suspected nightclub owner, Antoine Jones, of narcotics trafficking.[170] Based on surveillance gathered from other sources, the officers secured a warrant authorizing the installation and use of a Global Positioning Satellite (GPS) tracking device on a vehicle used by Jones.[171] The officers failed to comply with the terms of the warrant.[172] Over the next

163. *Id.* at 714.
164. *Id.* at 715 (contrasting the facts of *Karo* with those of *Knotts*, 460 U.S. at 281).
165. *Id.* at 714–15.
166. *See* Kimberly C. Smith, Comment, *Hiding in Plain Sight: Protection from GPS Technology Requires Congressional Action, Not a Stretch of the Fourth Amendment*, 62 MERCER L. REV. 1243, 1251 (2010).
167. *See id.*
168. *See* United States v. Jones, 132 S. Ct. 945, 948 (2012); Kevin Emas & Tamara Pallas, United States v. Jones*: Does* Katz *Still Have Nine Lives?*, 24 ST. THOMAS L. REV. 116, 144–45 (2012).
169. *See Jones*, 132 S. Ct. at 952.
170. *Id.* at 948.
171. *Id.*
172. *Id.*

twenty-eight days, the officers tracked all of the vehicles movements, twenty-four hours per day.[173] The locational data gathered by officers from the GPS device connected Jones to a stash house containing large amounts of cash and cocaine.[174]

In speaking for the Court, Justice Scalia framed the issue as "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 . . . within the meaning of the Fourth Amendment."[175] In answering in the affirmative, the Court relied on the trespass doctrine from *Olmstead*, rather than the *Katz* test.[176]

Justice Scalia explained the Court's reasoning and stated that an automobile is a constitutionally protected "effect" as the term is used in the Fourth Amendment.[177] By installing and monitoring the GPS device, the Government "physically occupied private property for the purpose of obtaining information."[178] In the Court's understanding, this trespass would have been considered a search at the time the Fourth Amendment was adopted in 1791.[179]

Justice Scalia proceeded to discuss the historical connection between the Fourth Amendment and common-law trespass remarking that "for most of our history the Fourth Amendment was understood to embody a particular concern for government trespass upon the areas ('persons, houses, papers, and effects') it enumerates."[180] According to Justice Scalia, the Supreme Court's decision in *Katz* simply deviated from an exclusively property-based approach, but did not eliminate it.[181]

The government posited that no search had occurred because Jones did not have a reasonable expectation of privacy in the underbody of the vehicle where the GPS tracker was attached.[182] However, Justice Scalia clarified that "the *Katz* reasonable expectation-of-privacy test has been *added to*, not *substituted for*, the common-law trespassory test."[183] Regardless of the *Katz* formulation, a search had occurred

173. *Id.*
174. *Id.* at 948–49.
175. *Jones*, 132 S. Ct. at 948.
176. *Id.* at 950.
177. *Id.* at 949 (citing United States v. Chadwick, 433 U.S. 1, 12 (1977)).
178. *Id.*
179. *Id.*
180. *Id.* at 950.
181. *Jones*, 132 S. Ct. at 950, 953.
182. *Id.* at 950.
183. *Id.* at 952 (emphasis in the original).

because the officers had physically encroached on a constitutionally protected area in violation of the Fourth Amendment.[184]

Justice Scalia went on to explain the Court's previous holdings in *Knotts*, *Karo*, and *Oliver* in light of the *Jones* holding.[185] Although law enforcement officers trespassed on an open field in *Oliver*, no search had occurred because an open field is not enumerated in the Fourth Amendment as a protected area.[186] Furthermore, in both *Knotts* and *Karo*, law enforcement officers attached the beepers to containers before they had come into the defendants' possession, so neither installation constituted a trespass.[187]

Finally, Justice Scalia essentially punted on the issue of whether, absent a trespass, electronic surveillance over a four week period is a search within the meaning of the Fourth Amendment.[188] He acknowledged that "[i]t may be that achieving the same result through electronic means, without an accompanying trespass, is an unconstitutional invasion of privacy, but the present case does not require us to answer that question."[189] After discussing the lack of precedent and the difficulty faced by the Court if it had to establish time limits for surveillance, Justice Scalia recognized "[w]e may have to grapple with these 'vexing problems' in some future case where a classic trespassory search is not involved . . . but there is no reason for rushing forward to resolve them here."[190] It could very well be that a challenge to UAS surveillance will present the Supreme Court with its hypothetical "future case."

III. EVALUATING UAS SURVEILLANCE: THE FOURTH AMENDMENT PROTECTS PLACES (FOR NOW), NOT PEOPLE

Given the temptation for law enforcement agencies to conduct surveillance on suspects before having any evidence of actual wrongdoing, a constitutional challenge to law enforcement's use of UAS could happen in the near future.[191] The threshold issue will be

184. *See id.*
185. *See id.* at 952–53.
186. *Id.* at 953.
187. *Jones*, 132 S. Ct. at 952.
188. *Id.* at 953–54.
189. *Id.* at 954.
190. *Id.*
191. *See* Matthew Radler, Note, *Privacy is the Problem:* United States v. Maynard *and a Case for a New Regulatory Model for Police Surveillance*, 80 GEO. WASH. L. REV. 1209, 1219 (2012).

whether UAS surveillance constitutes a search within the meaning of the Fourth Amendment, which is "presumptively unreasonable" in the absence of a warrant.[192] In light of the Supreme Court's jurisprudence, the outcome of such a challenge would likely depend on where the surveillance took place.

A. Dragnet Surveillance and an Expectation of Privacy in Public Places

Based primarily on the Supreme Court's decisions in *Knotts* and *Karo*, it is probably permissible for the government to track individuals in public places using UAS surveillance without a warrant.[193] The Court made it clear that an individual traveling in an automobile has no expectation of privacy in his movements on public streets.[194] Considering that the reason for this rule is that an individual traveling in an automobile voluntarily conveys his movements to the public and is in "plain view," it is reasonable to conclude that an individual traveling by foot on public roads, sidewalks, or in public parks would also have no expectation of privacy.[195]

Provided the same information revealed by UAS surveillance could be obtained by using visual surveillance from a public place, there is no constitutional prohibition on the government's use of sense-enhancing technologies for tracking.[196] The only way that UAS tracking could constitute a search is if the Court makes a categorical distinction between electronic beeper technology and UAS platforms.[197] This is unlikely to happen because, in upholding warrantless tracking, the Supreme Court did not focus on the technology used, but on the lack of a reasonable expectation of privacy in public places.[198] In fact, law enforcement could probably even use UAS outfitted with technology such as automated license plate readers[199] or facial recognition software.[200]

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192. Kyllo v. United States, 533 U.S. 27, 40 (2001).
193. *See supra* Part II.D.
194. *See supra* text accompanying note 151.
195. *See* United States v. Knotts, 460 U.S. 276, 281–82 (1983).
196. *See id.* at 282.
197. If a court did make this distinction, its search analysis would likely turn on whether the UAS is in navigable airspace and how routine UAS surveillance is to determine if an individual has a reasonable expectation of privacy from UAS surveillance in public areas. *See* THOMPSON, *supra* note 7, at 13.
198. *See Knotts*, 460 U.S. at 281–82.
199. *See* Cardwell v. Louis, 417 U.S. 583 (1974) (holding that law enforcement's examination of the exterior of a car is not a Fourth Amendment search).

The Supreme Court's most recent decision in *Jones* fails to resolve the question of whether pervasive long-term tracking of an individual in public places constitutes a search.[201] UAS platforms will soon give the government the technological capability, at least theoretically, to track an individual endlessly.[202] Further, the government can conduct UAS surveillance without trespassing on an individual's private property.[203] In the absence of a trespass, UAS surveillance would be examined under the *Katz* test.[204] Because there is no expectation of privacy in public places, the Fourth Amendment does not currently protect individuals from extended, warrantless, and even suspicionless UAS surveillance by law enforcement.[205]

B. UAS Surveillance of the Curtilage of the Home

At first glance, the Supreme Court's decisions in *Ciraolo* and *Riley* indicate that government surveillance of the curtilage of the home using UAS would not constitute a search and could be conducted without a warrant.[206] As long as the area under surveillance is at least partially open to observation from above, then it is "knowingly expose[d]" and falls outside the scope of Fourth Amendment protection because society would not recognize such an expectation of privacy as reasonable.[207] However, UAS surveillance presents some unique considerations that could alter the outcome of judicial scrutiny.

First, in both *Ciraolo* and *Riley*, the police surveillance in question took place from manned aircraft and the Court emphasized the fact that police observations were made with the naked eye, rather than sense-enhancing technology.[208] Additionally, it is critical to the Court's analysis that police were in navigable airspace where "private

200. *Id.* at 590 (holding that the occupants of automobiles have a reduced expectation of privacy because they are in "plain view").

201. *See* Lauren Millcarek, *Eighteenth Century Law, Twenty-First Century Problems:* Jones, *GPS Tracking, and the Future of Privacy*, 64 FLA. L. REV. 1101, 1110 (2012).

202. *See supra* text accompanying notes 59–63.

203. In *Jones*, the Supreme Court did not prohibit long term tracking, but rather a warrantless government trespass. *See* United States v. Jones, 132 S. Ct. 945, 948, 954 (2012).

204. *Id.* at 953.

205. *See* United States v. Knotts, 460 U.S. 276, 281 (1983).

206. *See supra* Part II.B.

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

208. *See* Florida v. Riley, 488 U.S. 445, 448 (1989); California v. Ciraolo, 476 U.S. 207, 213–14 (1986).

and commercial flight . . . is routine."[209] Because any member of the public could have made the same observations, an expectation of privacy is rendered unreasonable.[210]

It is unclear if UAS surveillance of the curtilage using cameras, thermal imaging, or other sensors would be analyzed differently than the naked eye observations the Court found permissible. The Supreme Court provided some insight into this question in *Dow Chemical*, where the Court recognized that the Fourth Amendment may prohibit the government from using highly sophisticated equipment without a warrant if the equipment is not generally available to the public.[211] The final analysis may hinge on the level of intimate details that are revealed by the technology.[212] The *Dow Chemical* Court determined that, even though the photographs taken by the government revealed more detail than the naked eye, the enhancement was not enough to raise constitutional problems.[213]

Unfortunately, the Court never stated how much technological enhancement of intimate details is allowed before aerial surveillance becomes a Fourth Amendment search.[214] To further complicate matters, *Dow Chemical* addressed the curtilage of an industrial complex, not a home.[215] Courts would likely allow less technological enhancement of intimate details in the curtilage of the home.[216] However, the Supreme Court does not consider all details of a home's curtilage to be intimate details, suggesting that a reviewing court might have discretion to decide in a given case whether or not the details revealed by UAS surveillance are intimate.[217]

Critical to a court's analysis would be how it evaluates UAS surveillance in light of the emphasis on aerial surveillance taking place in navigable airspace and the routine nature of private and commercial flights.[218] Because the FAA is currently establishing navigable airspace for UAS, private and commercial usage of UAS is

209. *Ciraolo*, 476 U.S. at 215.
210. *See Riley*, 488 U.S. at 448–49; *Ciraolo*, 476 U.S. at 213–14.
211. *See* Dow Chem. Co. v. United States, 476 U.S. 227, 238 (1986).
212. *See id.*
213. *Id.*
214. *See id.* at 238–39.
215. *See id.* at 229.
216. Unlike the curtilage of the home which enjoys a heightened expectation of privacy, "industrial curtilage" is more analogous to open fields. *Id.* at 236–37.
217. *Compare* Florida v. Riley, 488 U.S. 445, 452 (1989) (finding that "no intimate details connected with the use of the home or curtilage were observed" when police viewed the contents of a greenhouse located in the curtilage), *with* Kyllo v. United States, 533 U.S. 27, 37 (2001) (stating that "[i]n the home . . . all details are intimate details.").
218. *See supra* Part II.B.

restricted and flights are rare.[219] In the absence of routine flights, it is reasonable to conclude that UAS surveillance of the curtilage of a home is currently a search within the meaning of the Fourth Amendment.[220] That analysis is likely to change in 2015 and beyond, when UAS are expected to become commonplace in U.S. airspace.[221]

Under Supreme Court jurisprudence, it is likely a search if the government uses UAS surveillance to expose areas within the curtilage which an individual has concealed from aerial observation.[222] Because the area is not exposed, and curtilage enjoys similar protection as the interior of the home, an expectation of privacy should be recognized as reasonable.[223] For example, if an individual planted trees in his backyard to conceal his actions from aerial observation, it would likely be a search if police used laser radar affixed to a UAS frame to see through the foliage.

Ultimately, any Fourth Amendment protection of the curtilage from warrantless UAS surveillance is likely expiring.[224] Once UAS are generally available to the public and their flights become routine in public airspace, an expectation of privacy from UAS surveillance will no longer be reasonable.[225] At that point the litigated issue will likely become whether the technology employed by a particular UAS is in general public use or not.[226] Many of the technologies, such as digital cameras, are already in general public use, and it may not be long before others join them.[227] The curtilage of the home may then be vulnerable to UAS surveillance without any Fourth Amendment protections.

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219. *See* Joseph J. Vacek, *Big Brother Will Soon Be Watching—Or Will He? Constitutional, Regulatory, and Operational Issues Surrounding the Use of Unmanned Aerial Vehicles in Law Enforcement*, 85 N.D. L. REV. 673, 684 (2009).

220. *See supra* Part II.B.

221. *See supra* text accompanying notes 33–34.

222. In both *Ciraolo* and *Riley*, the areas observed by police were exposed to the view from navigable airspace, leading the Court to conclude that an expectation of privacy could not be recognized as reasonable. *See Riley*, 488 U.S. at 450–51; California v. Ciraolo, 476 U.S. 207, 213–14 (1986).

223. *See* Oliver v. United States, 466 U.S. 170, 178 (1984).

224. *See infra* text accompanying notes 245–50.

225. In *Kyllo*, the finding of a search was conditioned on the Supreme Court's determination that "the technology in question is not in general public use," and it is inconceivable that a court would grant curtilage greater constitutional protection than the home itself. *See* Kyllo v. United States, 533 U.S. 27, 34–35 (2001).

226. *See* McBride, *supra* note 28, at 657.

227. *See* Dunlap, *supra* note 6, at 199–200.

C. *UAS Surveillance of the Home*

Although the Court has never addressed the issue of aerial surveillance of the interior of the home, it has established that the home is where the most heightened privacy expectations exist.[228] When law enforcement officials use sense-enhancing technology to obtain information about the interior of a home that they could not have otherwise obtained without a physical intrusion, then a search has occurred and a warrant is required.[229] If law enforcement officials use thermal imaging technology attached to a UAS frame to observe details inside the home, then a court would almost certainly conclude that to be a search.[230]

However, the Court's holding in *Kyllo* fails to resolve the issue of how a court would address a UAS taking photographs or video of the interior of a home through open skylights, doors, or windows.[231] For example, if a UAS captured video of a suspect manufacturing a controlled substance through a window, would that constitute a search under the Fourth Amendment? In the absence of a clear answer, a court might begin its analysis by determining if the same information could have been otherwise obtained without a physical intrusion into the home.[232]

If the same information could have been observed by law enforcement officers using the naked eye from a lawful vantage point, then the UAS surveillance might not constitute a search.[233] When areas such as windows and skylights are left uncovered, the areas within the home might be considered "knowingly expose[d]";[234] therefore, under the *Katz* test, naked-eye observations may not violate an expectation of privacy that society recognizes as reasonable.[235] The Court has specifically stated that "[t]he Fourth Amendment protection of the home has never been extended to require law enforcement officers to shield their eyes when passing by a home on public thoroughfares."[236]

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228. *See* Dow Chem. Co. v. United States, 476 U.S. 227, 237–38 (1986).

229. *See Kyllo*, 533 U.S. at 34.

230. It would not matter what details inside the home are revealed since "*all* details are intimate details, because the entire area is held safe from prying government eyes." *Id.* at 37.

231. *See* Dunlap, *supra* note 6, at 198–200.

232. *Kyllo*, 533 U.S. at 34.

233. In holding that there was a search in *Kyllo*, the Court emphasized the fact that police had engaged in "more than naked-eye surveillance of a home." *Id.* at 33.

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

235. *See id.* at 361 (Harlan, J., concurring).

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

UAS technology presents some unique difficulties for the courts to resolve. First, it would be practically impossible in most, if not all, cases for courts to determine if the same information obtained by high-powered cameras on a UAS could have been observed by law enforcement officers by the naked eye from navigable airspace.[237] For instance, how could a court determine whether photographs taken through a skylight by a UAS flying thirty feet above a house were functionally equivalent to an officer's naked-eye view from a helicopter flying in publicly navigable airspace at 400 feet?[238] The effort and expense of proof would make litigating these issues on a case-by-case basis nearly impossible.[239]

Despite a strong argument that UAS surveillance should not constitute a search as long as it shows nothing more or different than what is revealed by naked-eye observation,[240] it is not clear that courts would accept technological surveillance as an equivalent substitute for manned surveillance.[241] In fact, in holding that the use of a camera to photograph an open industrial area is not a search, the Supreme Court emphasized that commercial property does not have the same heightened expectation of privacy as the home and stated that "the photographs here are not so revealing of intimate details as to raise constitutional concerns."[242] However, given the expectation of privacy in the home and the Supreme Court's assertion that "[i]n the home . . . *all* details are intimate details,"[243] it could be that any

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237. In *Ciraolo*, *Riley*, and *Dow Chem. Co.*, the Supreme Court considered it critical that the police observations took place from navigable airspace where any member of the public flying overhead could observe the same thing the police did. *See Ciraolo*, 476 U.S. at 213–14; Florida v. Riley, 488 U.S. 445, 450 (1989); Dow Chem. Co. v. United States, 476 U.S. 227, 238 (1986).

238. Four hundred feet is the same altitude the police were flying when they observed marijuana plants through openings in a greenhouse roof in *Riley*. *Riley*, 488 U.S. at 448.

239. It is likely that the only way law enforcement could demonstrate in a given case that UAS surveillance could have been obtained by naked-eye observation would be to fly a manned aircraft over the area in question. Anytime a court determines that UAS technology revealed more than what could be observed with the naked eye, a search will have occurred. *See* Kyllo v. United States, 533 U.S. 27, 33–34 (2001).

240. In *Knotts*, the Supreme Court held that the use of an electronic tracking device was not a Fourth Amendment search because it revealed nothing that the public could not observe through visual observation. United States v. Knotts, 460 U.S. 276, 285 (1983).

241. *See Kyllo*, 533 U.S. at 35 n.2.

242. *Dow Chem. Co.*, 476 U.S. at 238–39.

243. *Kyllo*, 533 U.S. at 37.

UAS surveillance taken through skylights, windows, or open doors constitutes a search.[244]

Finally, and most importantly, in *Kyllo*, the Supreme Court may have opened the door to warrantless UAS surveillance of the home at some point in the not-too-distant future.[245] In holding that the use of thermal imaging constitutes a search, the Court provided an important caveat by stating that when the technology used is available to the general public, it does not constitute a search.[246] Therefore, it appears that the Court's bright-line rule drawn at the entrance to the home may have been written in "disappearing ink."[247]

To date, UAS are not in general public use.[248] That is about to change since certain government agencies are allowed to operate them, the FAA is required to fully integrate them into U.S. airspace by 2015, and their decreasing cost makes them more widely accessible.[249] Once the use of UAS becomes commonplace, the government may be able to use them to photograph or scan the interior of a home without a warrant, regardless of whether the information revealed could not have otherwise been obtained without a physical intrusion.[250] Therefore, under the Supreme Court's current jurisprudence, an expectation of privacy from unmanned aerial surveillance of the home could become unreasonable, removing Fourth Amendment protections from the place that has historically enjoyed the greatest protection.[251]

IV. ENSURING A REASONABLE FUTURE BY PREVENTING UNREASONABLE UAS SURVEILLANCE

Speaking for the Supreme Court in *Kyllo*, Justice Scalia acknowledged that technological advances have reduced the privacy

244. Although the Supreme Court has considered whether a Fourth Amendment search occurs when law enforcement officers look through the window of a home with the naked eye, the Court did not reach the issue because the challengers lacked standing. *See* Minnesota v. Carter, 525 U.S. 83, 91 (1998).

245. *See Kyllo*, 533 U.S. at 34.

246. *Id.*

247. Dunlap, *supra* note 6, at 199.

248. The FAA has restricted permits for UAS usage primarily because of safety concerns such as the inability of UAS to see and avoid other aircraft. McBride, *supra* note 28, at 654.

249. *See supra* text accompanying notes 28–35.

250. Dunlap, *supra* note 6, at 199. Once UAS become commonplace, it is likely that a court's search analysis will become dependent on whether the surveillance technology utilized in a specific case is in general public usage. *See id.*

251. *See* McBride, *supra* note 28, at 661.

protections granted by the Fourth Amendment.[252] In Justice Scalia's mind, the primary issue facing the Court was "what limits there are upon this power of technology to shrink the realm of guaranteed privacy."[253] Attempting to determine how courts might decide the constitutionality of warrantless UAS surveillance of the home and its curtilage is context-dependent, and ultimately speculative.[254]

As one author has noted, if UAS surveillance is not a Fourth Amendment search, then the "realm of guaranteed privacy" referred to by Justice Scalia would not just be shrunk, but eliminated.[255] Even if UAS surveillance is currently a search subject to the Fourth Amendment that status may be lost as UAS flights become routine.[256] Furthermore, the Fourth Amendment does not currently protect anyone's privacy from UAS surveillance, even for extended periods, when they are in public or other open areas.[257]

To ensure that privacy will be protected from the threat posed by UAS surveillance, a new rule should be added to current Fourth Amendment jurisprudence. Courts should hold that all UAS surveillance by law enforcement constitutes a search within the meaning of the Fourth Amendment, and is presumptively unreasonable without a warrant.[258] Under this rule, all warrantless UAS surveillance used for law enforcement purposes such as criminal investigation, targeted surveillance, and monitoring property or zones, would violate the Fourth Amendment regardless of where the surveillance took place.[259]

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252. *See* Kyllo v. United States, 533 U.S. 27, 33–34 (2001).

253. *Id.* at 34.

254. *See supra* Part III.B–C.

255. McBride, *supra* note 28, at 660–61.

256. *Id.* at 661.

257. *See supra* Part III.A.

258. This rule will remain subject to all the existing exigency exceptions to the warrant requirement that are currently recognized by the Supreme Court. For example, under the hot pursuit exception, police would be able to use UAS, without a warrant, to track fleeing suspects who represent a danger to police or the public. *See* Warden v. Hayden, 387 U.S. 294, 298–99 (1967). Similarly, if police are lawfully using UAS and inadvertently observe illegal conduct or evidence of a crime, then they will be able to use the surveillance against a defendant in the criminal trial based on the "plain view" exception. *See* Coolidge v. New Hampshire, 403 U.S. 443, 465–66 (1971).

259. Subject to existing Supreme Court jurisprudence, a warrant may not be required if UAS surveillance is conducted for purposes other than strict law enforcement. *See* THOMPSON, *supra* note 7, at 17. Suppose a government UAS being used for a health and safety purpose such as firefighting or environmental protection were to spot marijuana plants in an individual's backyard. To determine if a Fourth Amendment

The justification for this rule should be grounded in the unprecedented technological capabilities of UAS and the unique threat they represent to privacy.[260] Although the Supreme Court has heard challenges to law enforcement's use of aerial surveillance, sense enhancing devices, and electronic tracking, it has never considered anything like UAS, which combine all three capabilities.[261] Historically, the cost of using personnel for traditional surveillance placed a practical limitation on police surveillance which acted to protect privacy.[262] The affordability of UAS could eliminate this constraint on excessive police presence and dramatically increase the potential for abuses.[263]

In addition, UAS' small size and silent operation allow them to operate in relative stealth.[264] Citizens could be observed by law enforcement without ever knowing they were under surveillance.[265] Although UAS are not invasive by causing "undue noise . . . wind, dust, or threat of injury," they may actually be more intrusive than conventional aircraft.[266] Because people will not have notice of UAS' approach or presence, they will be unable to keep private those activities which they do not wish to expose to public view.[267]

UAS technology has been described as providing law enforcement with "permanent, multi-dimensional, multi-sensory surveillance of citizens twenty-four hours per day."[268] Some have gone as far as claiming that UAS give law enforcement capabilities reserved for deities.[269] As such, UAS present the potential for unprecedented law enforcement abuses which would be prevented by the warrant requirement proposed here.

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search had occurred, a court would need to balance the individual's expectation of privacy against the government's interest. *See* Nat'l Treasury Emps. Union v. Von Raab, 489 U.S. 656, 665–66 (1989). Similarly, warrantless surveillance of international borders can continue because of the government's interest in preventing unlawful entry of persons, smuggling of contraband, or other threats. *See* United States v. Montoya de Hernandez, 473 U.S. 531, 538 (1985) (explaining that, at the border, "[r]outine searches . . . are not subject to any requirement of reasonable suspicion, probable cause, or warrant").

260. *See* STANLEY & CRUMP, *supra* note 38, at 10–13.
261. *See supra* Part II.B–D.
262. *See* United States v. Jones, 132 S. Ct. 945, 963–64 (2012) (Alito, J., concurring).
263. *See* THOMPSON, *supra* note 7, at 16.
264. *See supra* Part I.B.
265. *See* Dunlap, *supra* note 6, at 201.
266. Florida v. Riley, 488 U.S. 445, 452 (1989).
267. *See* McBride, *supra* note 28, at 659.
268. *See* Vacek, *supra* note 219, at 675.
269. *Id.*

Not only will this proposed rule ensure that the Fourth Amendment remains the guarantor of privacy, but it provides other advantages as well.[270] First, it draws a bright-line rule for police who will not have to determine in advance whether or not their actions are constitutional each time they want to use a UAS in a new context, or when they are armed with a new technology.[271] Similarly, the courts will not lag behind each new technological advance in UAS technology because a warrant will always be required.[272] Finally, and most importantly, the rule will accomplish what current jurisprudence cannot: it will prevent Fourth Amendment protections from being left "at the mercy of advancing technology."[273]

The Supreme Court has established precedent for adopting the rule proposed here.[274] In *Katz*, the Court shifted the basis of finding that a Fourth Amendment search had occurred from a physical trespass to an intrusion on a reasonable expectation of privacy.[275] In doing so, the Court demonstrated its willingness to adopt new rules to ensure that privacy is protected from threats posed by new technologies. By adopting the rule proposed here, the courts would be acting in accordance with the precedent from *Katz* and would guarantee that UAS technology remains within the scope of Fourth Amendment protections.

A. The Inability of the Katz Test to Address UAS Surveillance

While the Supreme Court's decision in *Jones* could be interpreted as an effort to bolster privacy protections in public places, it will not affect UAS surveillance which involves no trespass.[276] If a challenge

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270. Fourth Amendment protection refers to the requirement of a warrant being issued upon a determination of probable cause before law enforcement can use UAS surveillance. *See* U.S. CONST. amend. IV.

271. This bright-line rule would likely last longer than the one established in *Kyllo*, which is vulnerable to any technology becoming commonplace. *See supra* text accompanying notes 248–54.

272. *See* Joshua S. Levy, *Towards a Brighter Fourth Amendment: Privacy and Technological Change*, 16 VA. J.L. & TECH. 502, 504–05 (2011) (discussing the courts' inability to keep up with technological change in their Fourth Amendment jurisprudence).

273. Kyllo v. United States, 533 U.S. 27, 35 (2001).

274. *See* Katz v. United States, 389 U.S. 347, 359 (1967) (holding that "the procedure of of antecedent justification . . . is central to the Fourth Amendment").

275. *See id.* at 353.

276. The trespass doctrine will not serve to protect the home or curtilage from UAS either because individuals have no property rights in the airspace over their property. *See* United States v. Causby, 328 U.S. 256, 261 (1946).

to prolonged UAS surveillance were to occur, the Court would have to either provide an arbitrarily determined length of time during which UAS surveillance could pass constitutional muster,[277] or hold that the Fourth Amendment is not implicated.[278]

Any time limit on warrantless UAS surveillance established by the Court would be based on an analysis of a reasonable expectation of privacy.[279] Some members of the Court, including Justice Sotomayor[280] and Justice Alito,[281] may support time limit rules as evidenced by their concerns that long-term tracking may interfere with privacy expectations. Even if the Court were to establish such a time limit, it would not be difficult for law enforcement to circumvent it.[282] However, there are more fundamental problems with the *Katz* test than practical concerns with its implementation.[283]

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277. In *Jones*, the Court hesitated to establish an arbitrary time limit on government tracking, given the lack of precedent. *See* United States v. Jones, 132 S. Ct. 945, 954 (2012). However, the Court has done so in the past. *See* Maryland v. Shatzer, 130 S. Ct. 1213, 1223 (2010) (holding that a fourteen day break in custody is required before police can interrogate a suspect who has asserted his right to counsel).

278. This would be the result under the *Katz* test because individuals have no expectation of privacy in their public movements. *See supra* text accompanying note 151.

279. Justice Scalia made it clear that "[s]ituations involving merely the transmission of electronic signals without trespass would *remain* subject to *Katz* analysis." *Jones*, 132 S. Ct. at 953.

280. Justice Sotomayor observed that long-term electronic tracking creates "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." *Id.* at 955 (Sotomayor, J., concurring). For Justice Sotomayor, the question is not simply whether people have a reasonable expectation of privacy in their public movements, but "whether people reasonably expect that their movements will be recorded and aggregated in a manner that enables the Government to ascertain, more or less at will, their political and religious beliefs, sexual habits, and so on." *Id.* at 956.

281. In *Jones*, Justice Alito criticized the majority for focusing on the government's "relatively minor" act of attaching a GPS to the bottom of a vehicle and ignoring the more important issue of using a GPS for long—term tracking of a suspect. *Id.* at 961 (Alito, J., concurring). In his view, it is incongruous that the Fourth Amendment applies when police follow a car for a brief time after attaching a GPS device, but it does not apply when police track individuals for long periods of time using aerial surveillance and unmarked cars. *Id.* He concluded that law enforcement's tracking of Jones' vehicle violated society's reasonable expectations that others "would not — and . . . could not —secretly monitor and catalogue every single movement of an individual's car for a very long period," and therefore constituted a Fourth Amendment search. *Id.* at 964.

282. Suppose the Court prohibited warrantless UAS tracking beyond two weeks. Law enforcement could simply surveil a suspect for thirteen days, continue to track the suspect for a day using traditional surveillance, and then resume UAS surveillance.

283. *See infra* notes 288–96.

The *Katz* reasonable expectation of privacy test has been criticized for its circular nature.[284] As long as UAS surveillance remains sufficiently rare, an individual's expectation of privacy is considered reasonable and it is protected from government intrusion by the Fourth Amendment.[285] Once UAS flights become routine, the expectation of privacy is no longer reasonable and its protection is removed.[286] The result becomes a "paradoxical situation in which law enforcement overreach is legitimized once it becomes routinized."[287] This could happen as early as 2015 when UAS can be fully integrated into U.S. airspace.[288]

Equally disconcerting is the fact that the Supreme Court's estimation of what society considers reasonable is not necessarily accurate.[289] Justice Scalia facetiously observed that "unsurprisingly, those 'actual (subjective) 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."[290] For example, poll results indicate that the American public opposes the use of UAS for routine police work.[291] According to the Court however, if the police used UAS to track people in public, they would lack constitutional protection because those people have no reasonable expectation of privacy.[292]

Considering these problems with the *Katz* formulation, some have argued that the protection of privacy, especially pertaining to sophisticated technologies such as UAS, should be removed from the courts and given to the legislature.[293] The problem with this solution is that it essentially concedes that, in the absence of legislation, the

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284. *See* McBride, *supra* note 28, at 662.

285. *See supra* Part III.B–C.

286. *See supra* Part III.B–C.

287. Priscilla J. Smith et al., *When Machines are Watching: How Warrantless Use of GPS Surveillance Technology Violates the Fourth Amendment Right Against Unreasonable Searches*, 121 YALE L.J. ONLINE 177, 194 (2011), *available at* http://yalelawjournal.org/images/pdfs/1017.pdf.

288. *See supra* text accompanying note 34.

289. *See infra* text accompanying notes 294–96.

290. Minnesota v. Carter 525 U.S. 83, 97 (1998) (Scalia, J., concurring) (citation omitted).

291. *See* MONMOUTH UNIV., *supra* note 67.

292. *See* United States v. Knotts, 460 U.S. 276, 281–82 (holding that a person travelling on a public street has no reasonable expectation of privacy in his movements as such information could be conveyed to the general public).

293. *See* Smith, *supra* note 166, at 1265 (arguing that Congress should establish warrant requirements for GPS surveillance); Walsh, *supra* note 14, at 244–45 (arguing that Congress should enact statutory regulations to govern UAS surveillance).

Fourth Amendment cannot protect privacy rights against the government's use of sophisticated technologies.[294] Instead, the courts need to adopt a novel jurisprudence to protect actual privacy expectations, rather than defer to Congress.

V. CONCLUSION

Under the Supreme Court's current jurisprudence, it is only a matter of time before the Fourth Amendment will no longer be able to provide protection from warrantless UAS surveillance, even in the home.[295] The answer to the question posed by Justice Scalia in *Kyllo* should not be that technology has the power to "shrink the realm of guaranteed privacy" to the point of elimination.[296] This is especially true given the Court's articulated concern that it "assures preservation of that degree of privacy against government that existed when the Fourth Amendment was adopted."[297]

Although the original degree of privacy is difficult to ascertain, allowing the government to use a UAS outfitted with facial recognition software or high-powered cameras to silently track individuals for extended periods of time without a warrant hardly seems to qualify.[298] Equally unlikely is the idea that Congress, rather than the Constitution, was expected to be the guarantor of privacy protections at the time the Fourth Amendment was adopted.[299] It is clear that the courts need a new approach to their Fourth Amendment jurisprudence to protect privacy from a technological onslaught. Requiring a warrant for all UAS surveillance will ensure that even the widespread use of UAS will not erode society's legitimate privacy expectations.

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294. *See* Walsh, *supra* note 10, at 247.

295. *See supra* Part III.

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

297. *Id.* The same concern influenced the Court's decision in *Jones*. *See* United States v. Jones, 132 S. Ct. 945, 949 (2012).

298. It is difficult to imagine Justice Scalia reassuring the object of such surveillance that he is enjoying the original protections of the Fourth Amendment.

299. *See* Walsh, *supra* note 10, at 247.

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